

NorCal-4 management questions from ELFO



Burrowing Owls

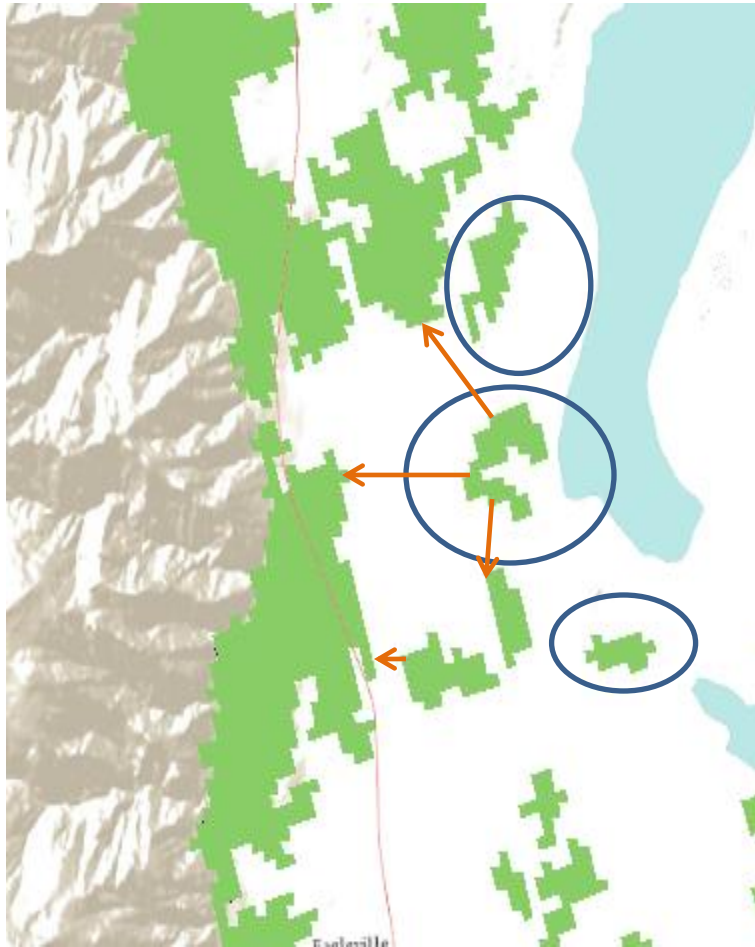
Mule Deer and Bald Mountain Trails

Rush Fire, Mule deer, and Pronghorn

Outline

- Terms and Broad Scale Boundaries
- Management Questions (MQs)
 - Burrowing Owls
 - Bald Mountain Trails, Mule Deer, Multiscale Data
 - Rush Fire and Mule Deer
 - Rush Fire and Pronghorn

Terminology: Broad Scale Indicators for the Biodiversity Land Health Standard



■ The **spatial distribution** of plant and animal species and their habitats allows for reproduction and recovery from localized catastrophic events



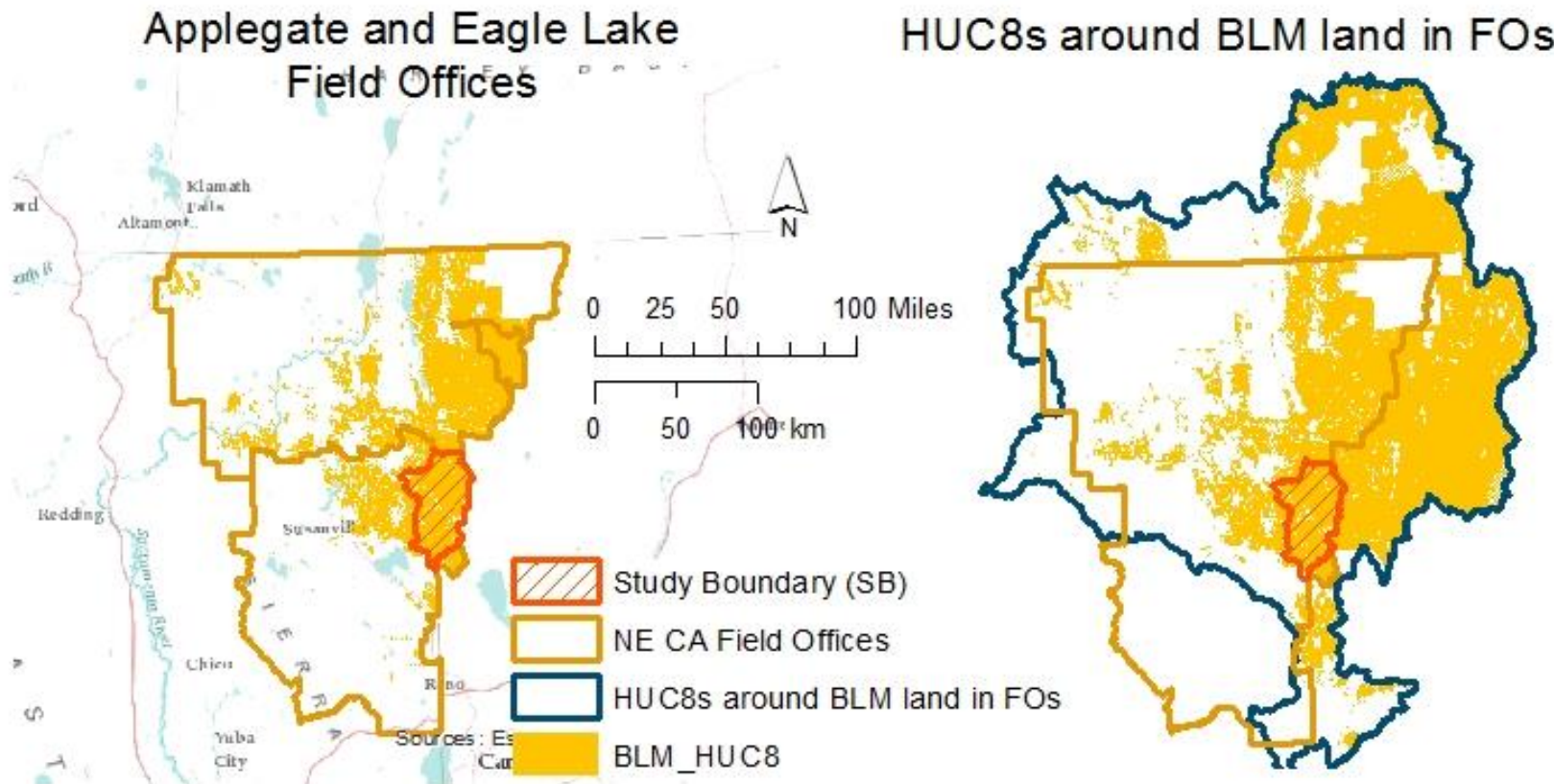
Habitat areas or patches should be large enough to support viable populations or are **connected** adequately with other similar habitat areas

- **Connectivity** distances can be dispersal or migration
- **Connectance** is the percentage of functional joins between all patches of the same type

Setting NorCal Boundaries (1 of 2)

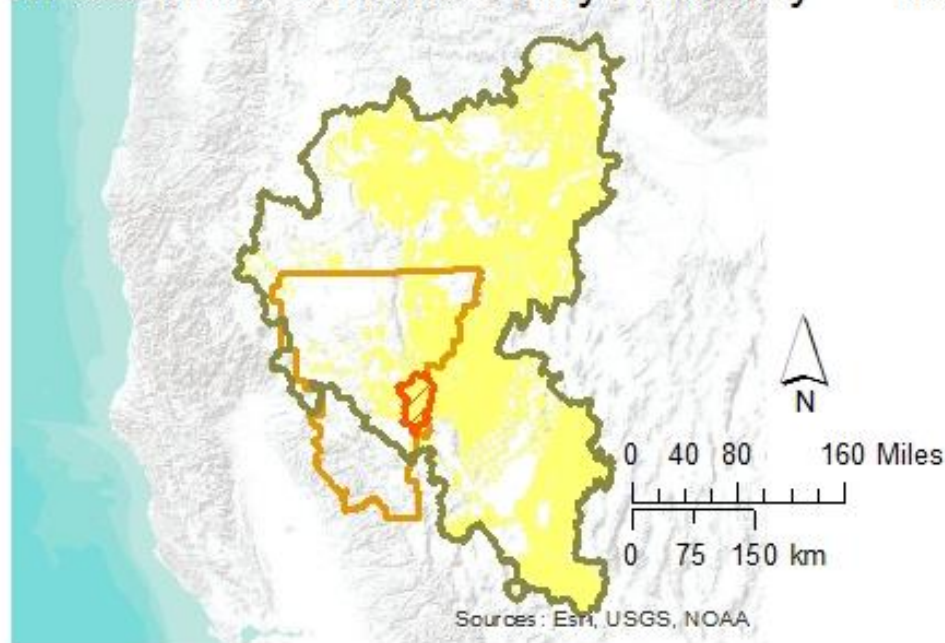
Complex geopolitical, ecological, physiographic region

NorCal: Suggested Boundaries for the Context Analysis

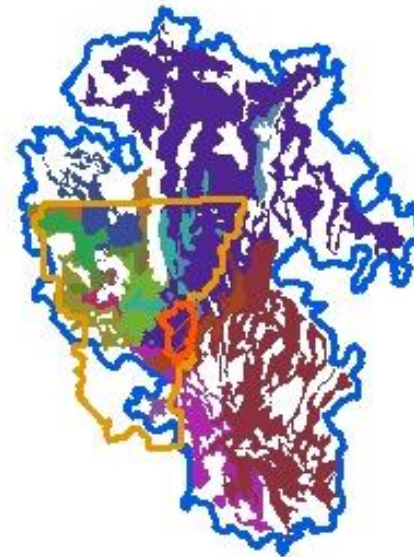


Setting NorCal Boundaries (2 of 2)

NRCS MLRAs around Study Boundary



HUC10s around level 4 ecoregions



- MLRA & HUC10s around study boundary
- Study Boundary (SB)
- NE CA Field Offices
- HUC8s around BLM land in FOs
- HUC 10s around L4 ecoregions
- BLM

Level 4 ecoregions

US_L4NAME

- Adin/Dixie Low Hills
- California Cascades Eastside Conifer Forest
- High Lava Plains
- Klamath Juniper Woodland/Devils Garden
- Klamath/Goose Lake Basins
- Lahontan Salt Shrub Basin
- Lahontan and Tonopah Playas

- Likely Tableland
- Modoc Lava Flows and Buttes
- Modoc/Lassen Juniper-Shrub Hills and Mountains
- Pit River Valleys
- Pluvial Lake Basins
- Semiarid Uplands
- Sierra Nevada-Influenced Semiarid Hills and Basins
- Sierra Valley

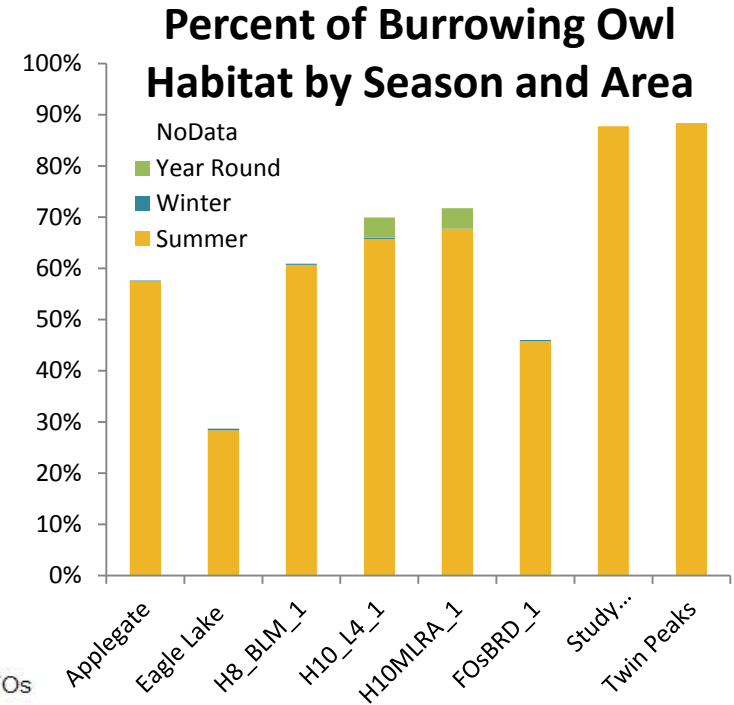
Burrowing Owl Habitat

MQ: How does the patch size and connectivity of burrowing owl habitat within Twin Peaks compare to the broader landscape?

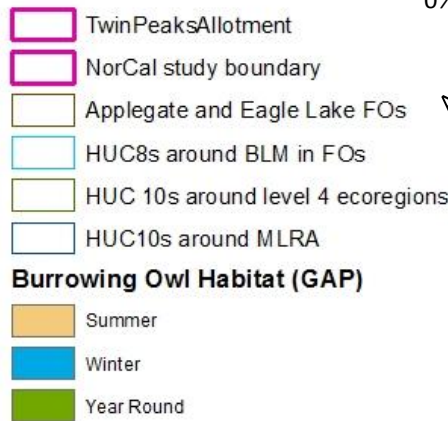


Factzoo.com

Burrowing Owl Habitat



Twin Peaks is mainly summer habitat. Larger areas are also used in winter and year round.



U.S. Geological Survey Gap Analysis Program (USGS-GAP). 2014. National Species Distribution Models.

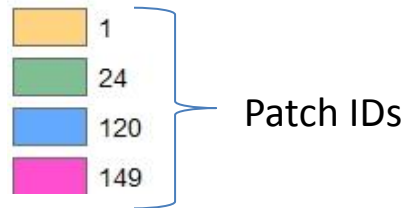
Available: <https://gapanalysis.usgs.gov>. Accessed [Aug 2016]

Burrowing Owl Summer Habitat in Twin Peaks

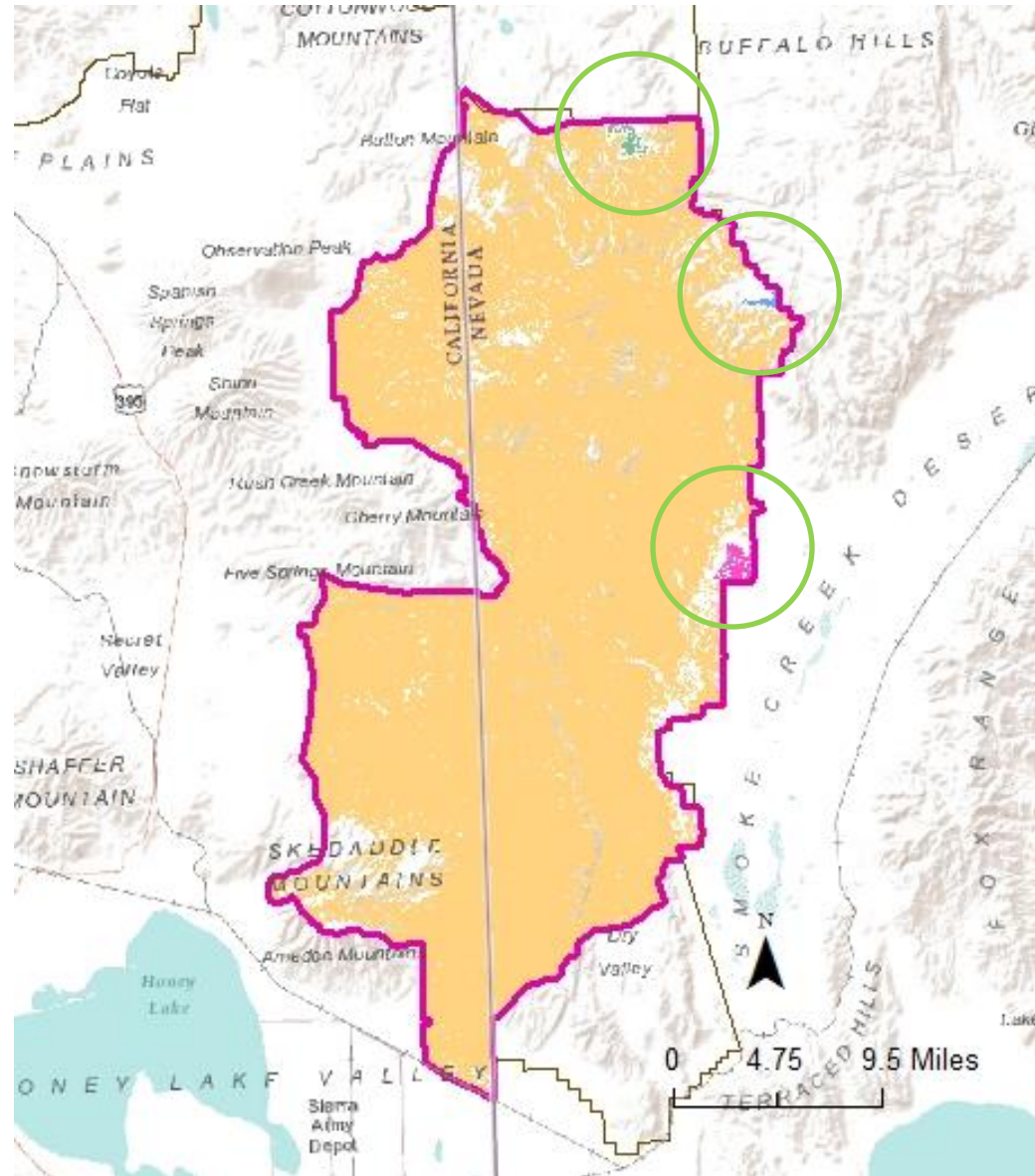
—one large patch (tan) and a bunch of tiny patches (only 3 are shown)

-  TwinPeaksAllotment
-  Applegate and Eagle Lake FOs

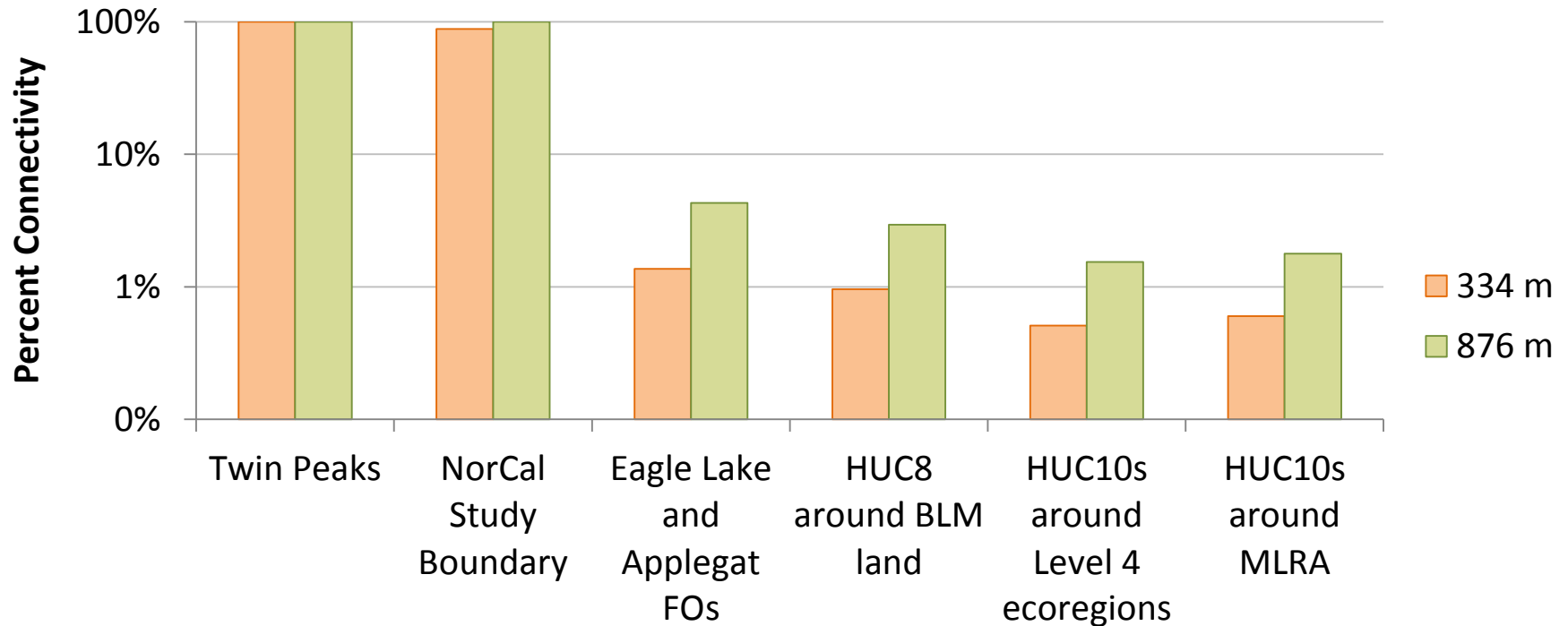
Burrowing Owl Distribution patches in Twin Peaks



 Small patch in legend.
Patches smaller than 1 km²
are not shown.



Burrowing Owl Summer Habitat Connectivity at nesting (334 m) and foraging (876 m) distances



- Smaller areas have higher connectivity because they are more homogeneous than larger areas
- Larger areas have different habitat, relatively smaller patches -> show reduced connectivity
- Twin Peaks is mainly summer habitat with high connectivity -> a good place for conservation

MQ: What are the impacts of 30 miles of non-motorized trail within Bald Mountain - an area of important mule deer habitat?

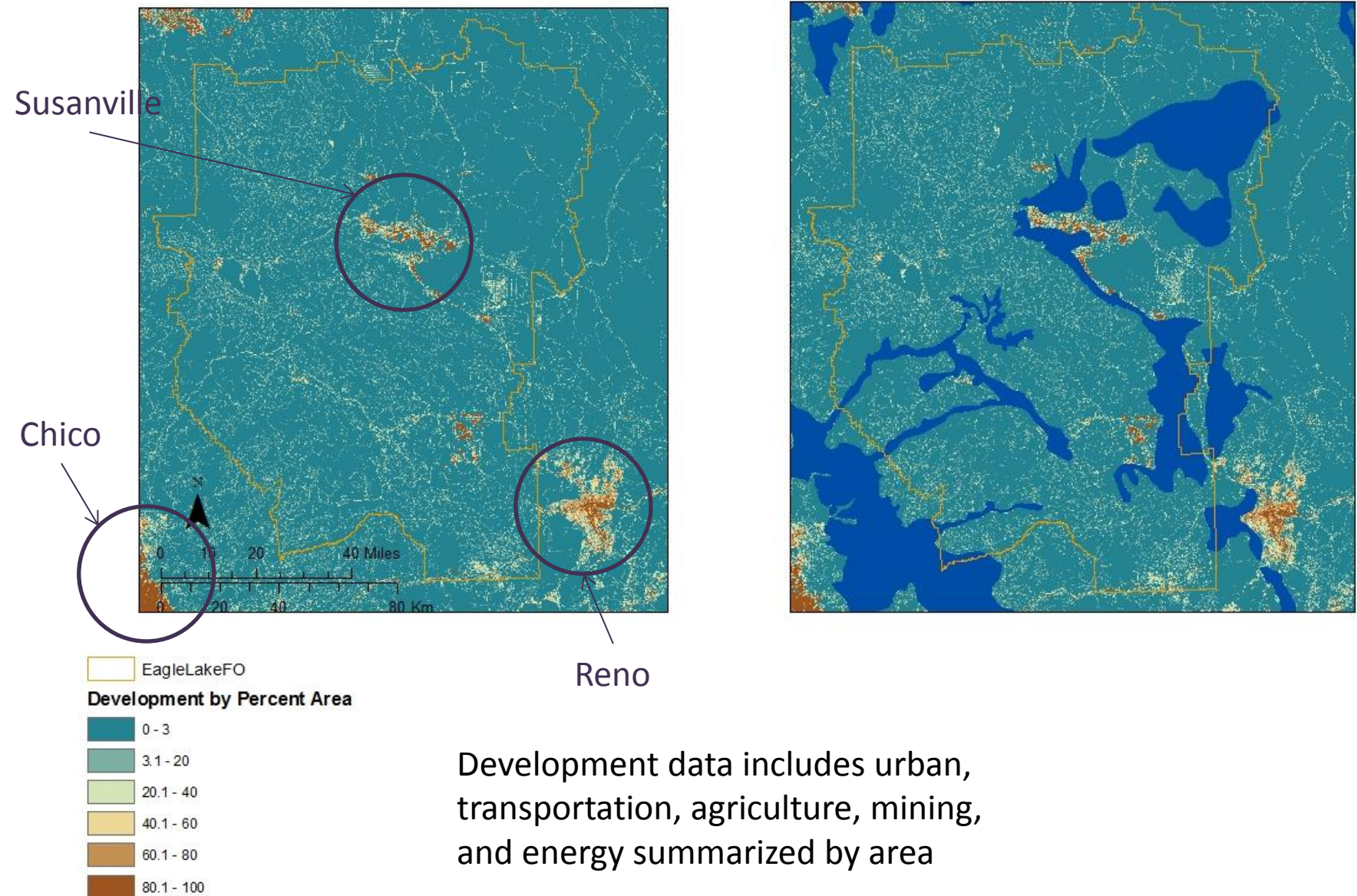
- The answer can be considered at 2 different scales: local and broad scale
- The data, analyses, and assumptions are then quite different...
- Data
 - **Broad scale:** west-wide data from Utah State U.
 - **Local scale:** seasonal mule deer habitat (from ELFO-RMP)

Broad Scale Data: Bald Mountain Trails and Mule Deer

- Probability of flushing a mule deer at 100 m from a trail:
 - 70% for a single human on trail and
 - 96% for a single human off trail
 - whether hiking or mountain-biking

(Taylor and Knight, 2003)
- Analysis:
 - Buffered Bald Mountain Trails by 100 m and merged them into the development raster (See ppt notes for more details)
 - Excluded areas with more than 3% development and areas outside mule deer winter range and winter concentration

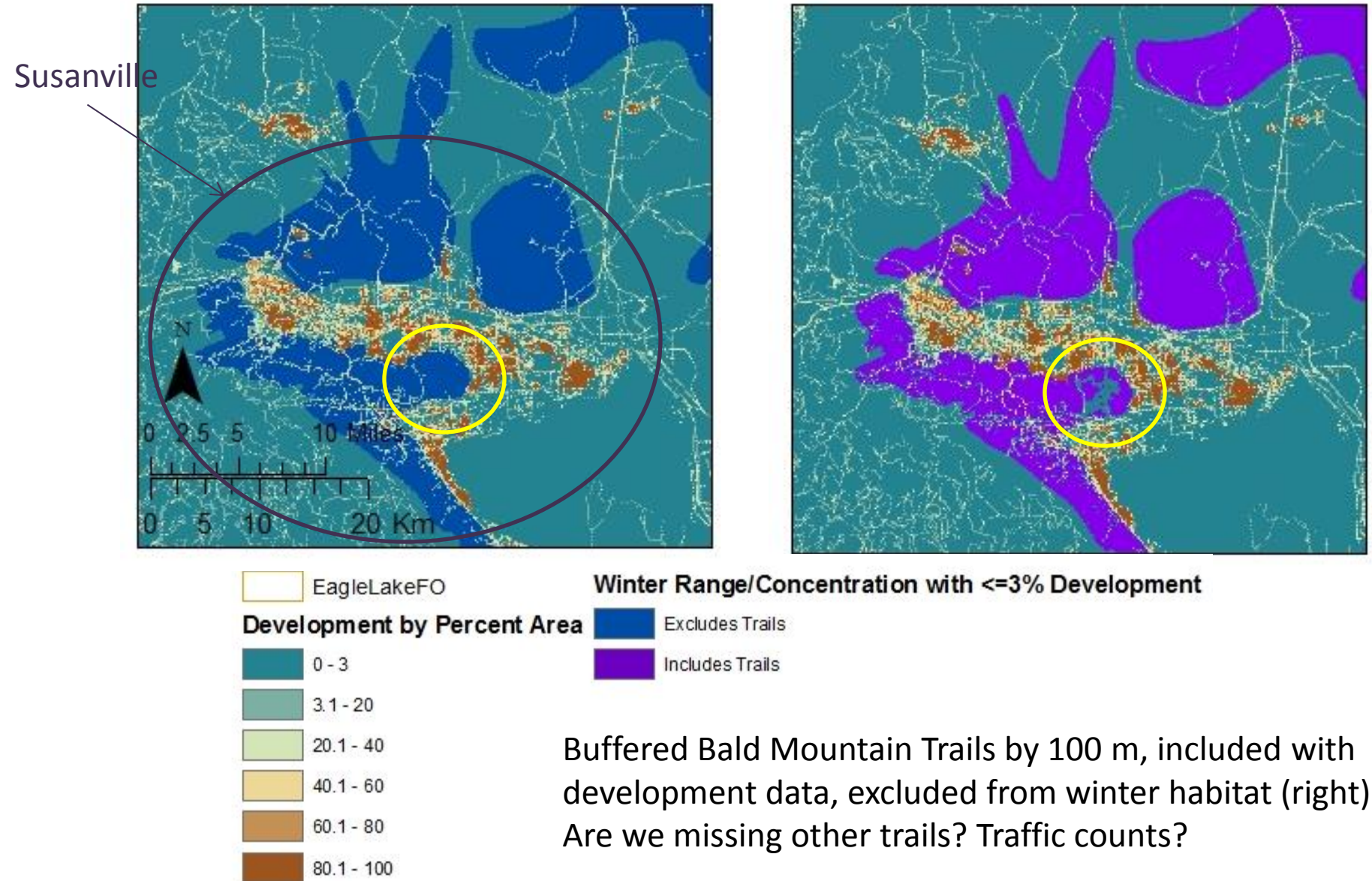
Broad Scale Development Data (left) and Mule Deer Winter Range and Winter Concentration (right - dark blue)



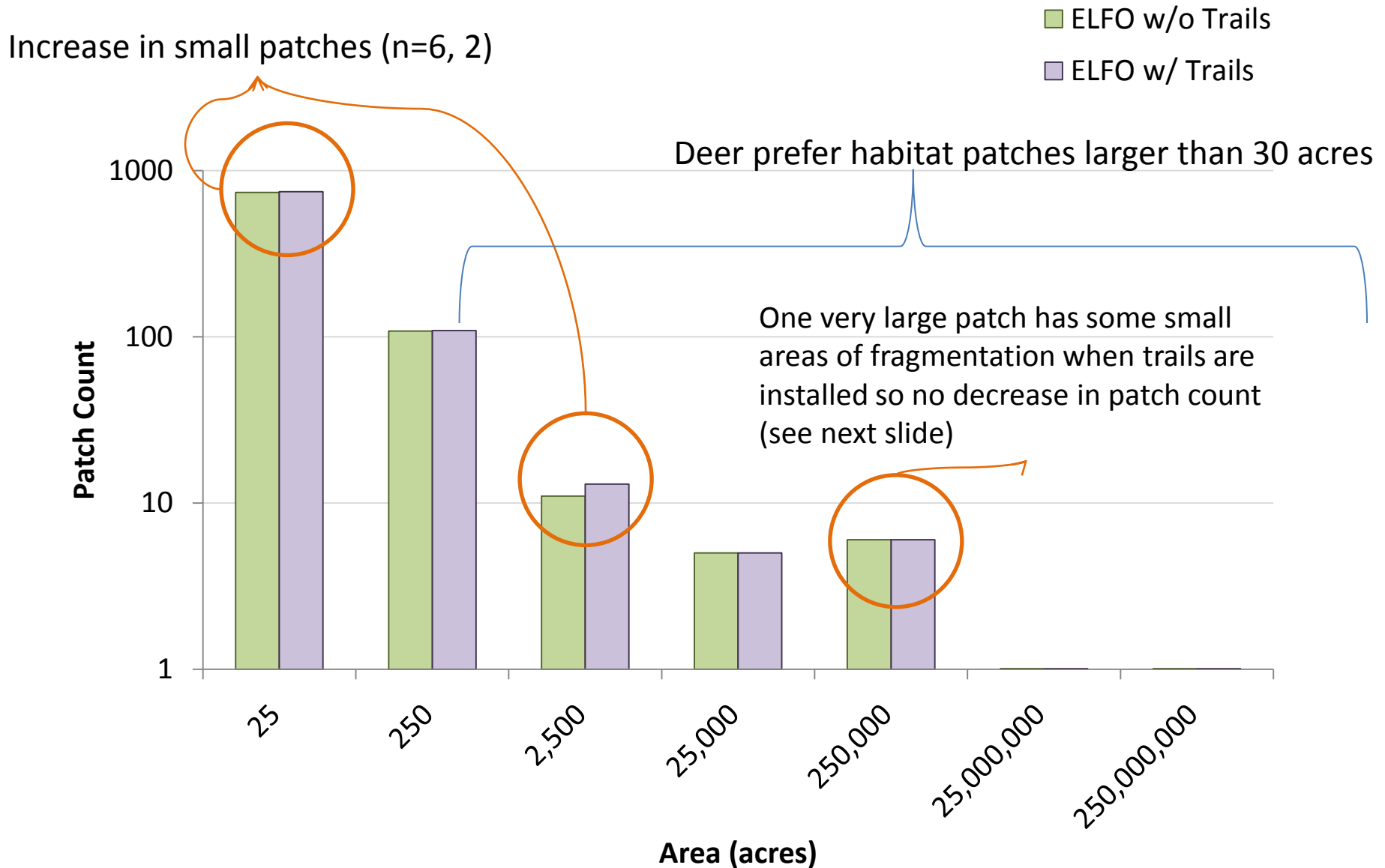
Zoom in to Susanville and Bald Mountain

Development Data and Mule Deer Winter Habitat

○ Left: Without Bald Mtn. Trails, Right: With Bald Mtn. Trails



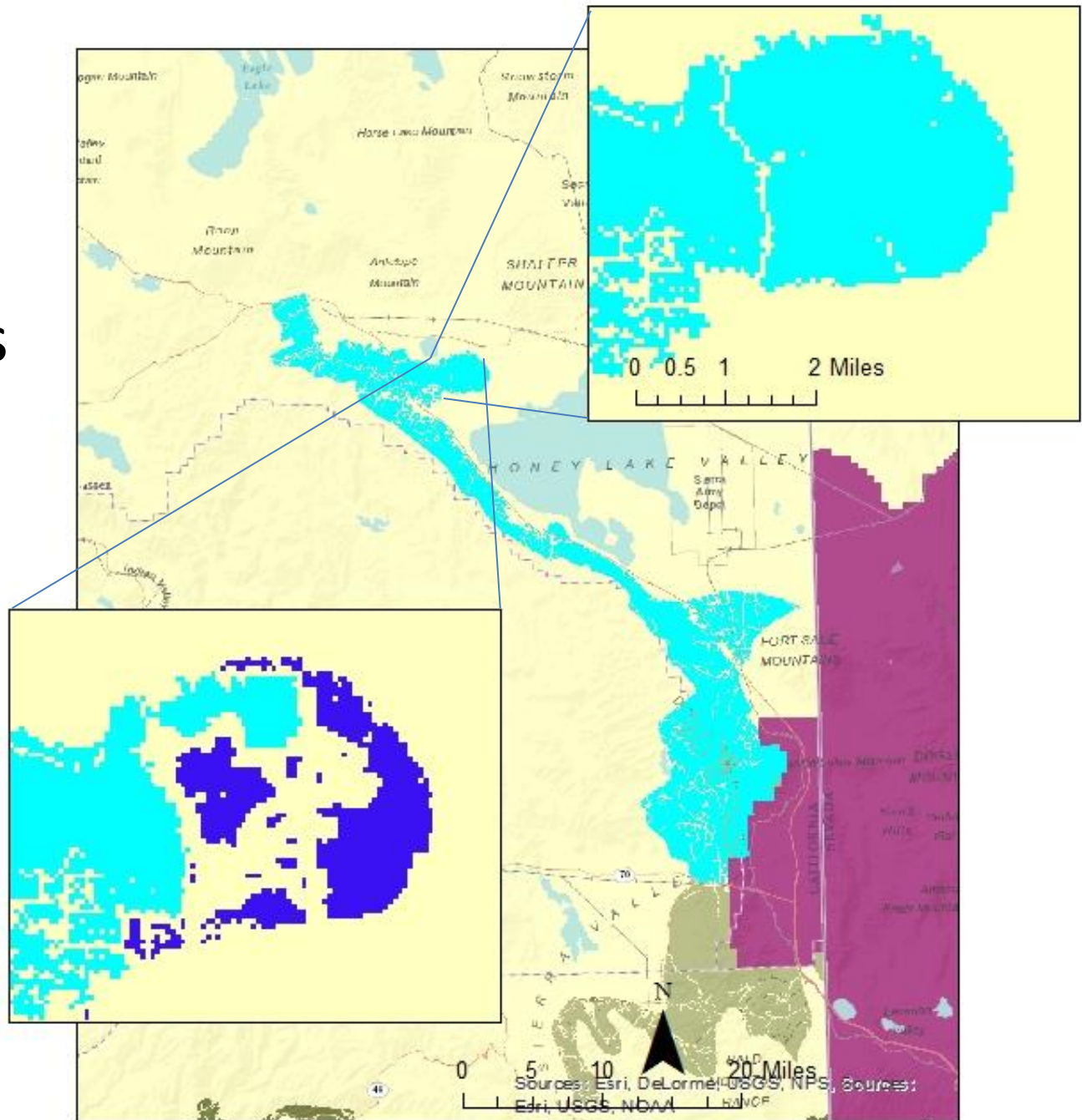
Mule Deer Habitat Patch Sizes for ELFO



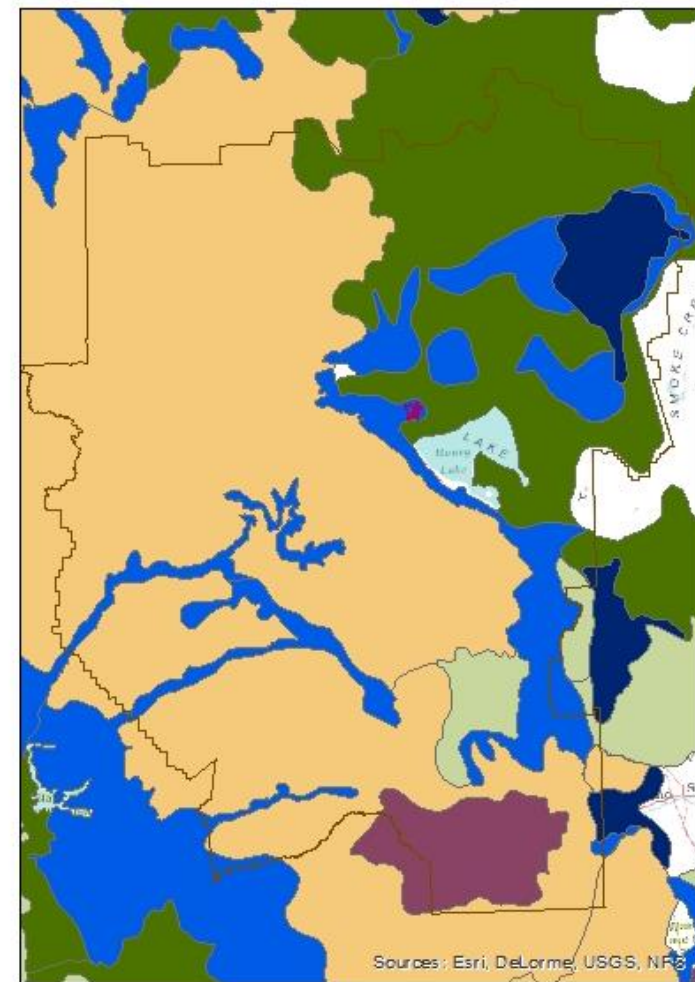
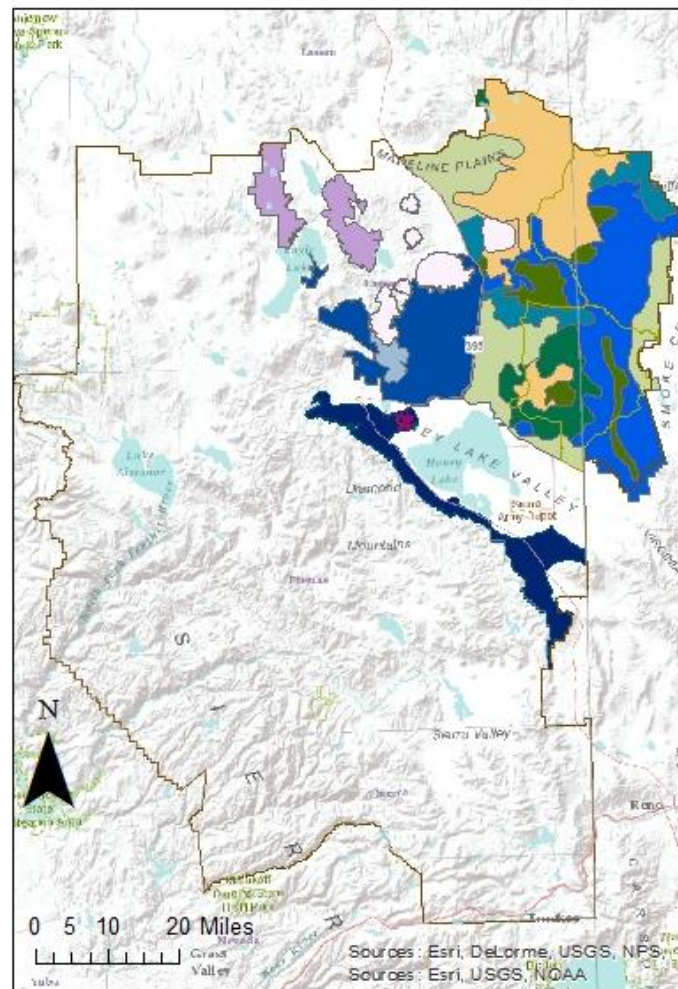
Fragmentation has occurred; is this enough to be a problem?

Patch analysis without trails (upper right) and with trails (lower left)

The light blue patch is the very large patch that is partially fragmented when trails are overlaid (all maps). The dark blue patches are the result of trails fragmenting Bald Mountain (lower right).



Local scale
(left) and
Broad Scale
(right)
Mule Deer
Data at
ELFO



Baldy Mountain Trails **RMP Mule Deer**

Eagle Lake FO **TYPE_USE**

Little or No Use

Priority Winter Habitat

Summer and Fawning

Summer and Transition

Transition

Winter

Winter and Transition

Yearlong and Fawning

critical winter range

key parturition habitat

winter range

Broad Scale Mule Deer

Year-round Population

Winter Concentration

Winter Range

Summer Range

Other Important Habitat

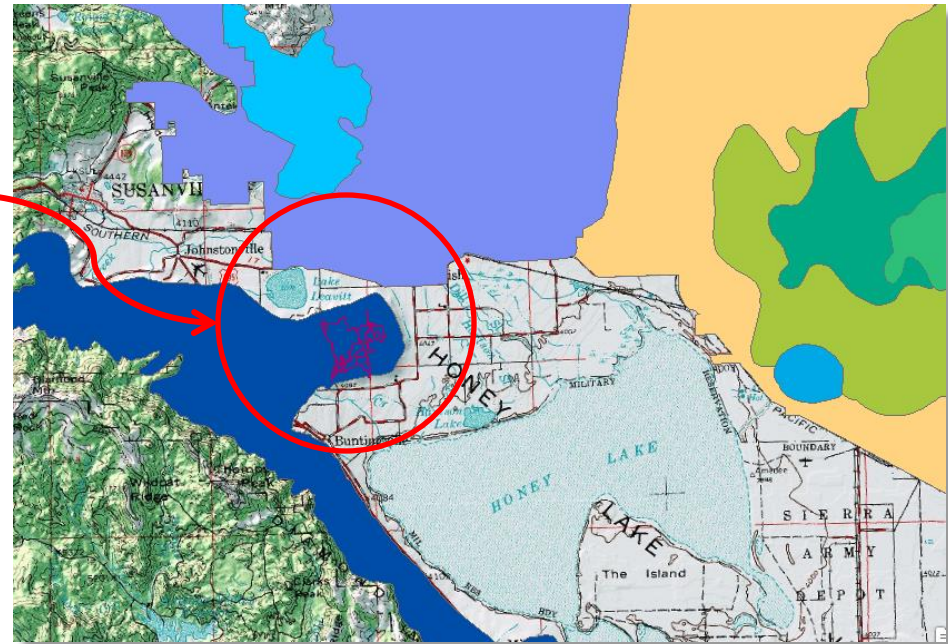
Limited Range

Bald Mountain Area Trails

- The trails are in mule deer priority winter habitat (103,000 acres)
- Priority winter habitat is 9% of the habitat map provided by ELFO
- The trails cover an area of roughly 4,800 acres or 5% of the priority winter habitat (0.5%)

BUT

- The area of Bald Mountain may provide an important link to the northern sections of mule deer habitat? (Min distance = 550m)
- Local knowledge of the linkage area (barriers?) and mule deer preferences are critical to determine the importance of this particular area.



Bald Mountain Trails

MultiScale Analyses summary

- Broad scale: Bald Mtn. Trails have a small effect on mule deer winter habitat metrics in the larger area.
- Local scale: Bald Mtn. Trails may create a pinch point limiting connectivity.
 - What are the barriers to mule deer crossing to the northern areas of habitat?
 - Only Field Office Staff can determine the importance of this effect on the ground.

Rush Fire Management Questions

- The Rush Fire burned almost half of the Twin Peaks Allotment which comprises much of the CA X5B hunt zone.
- CA X5B was the prized mule deer and pronghorn hunting zone in California before the Rush Fire. The area supported large and healthy pronghorn and mule deer populations.

MQ: What effect did the Rush Fire have on the patch size and connectivity for mule deer habitat within the Twin Peaks allotment and within the greater landscape context?

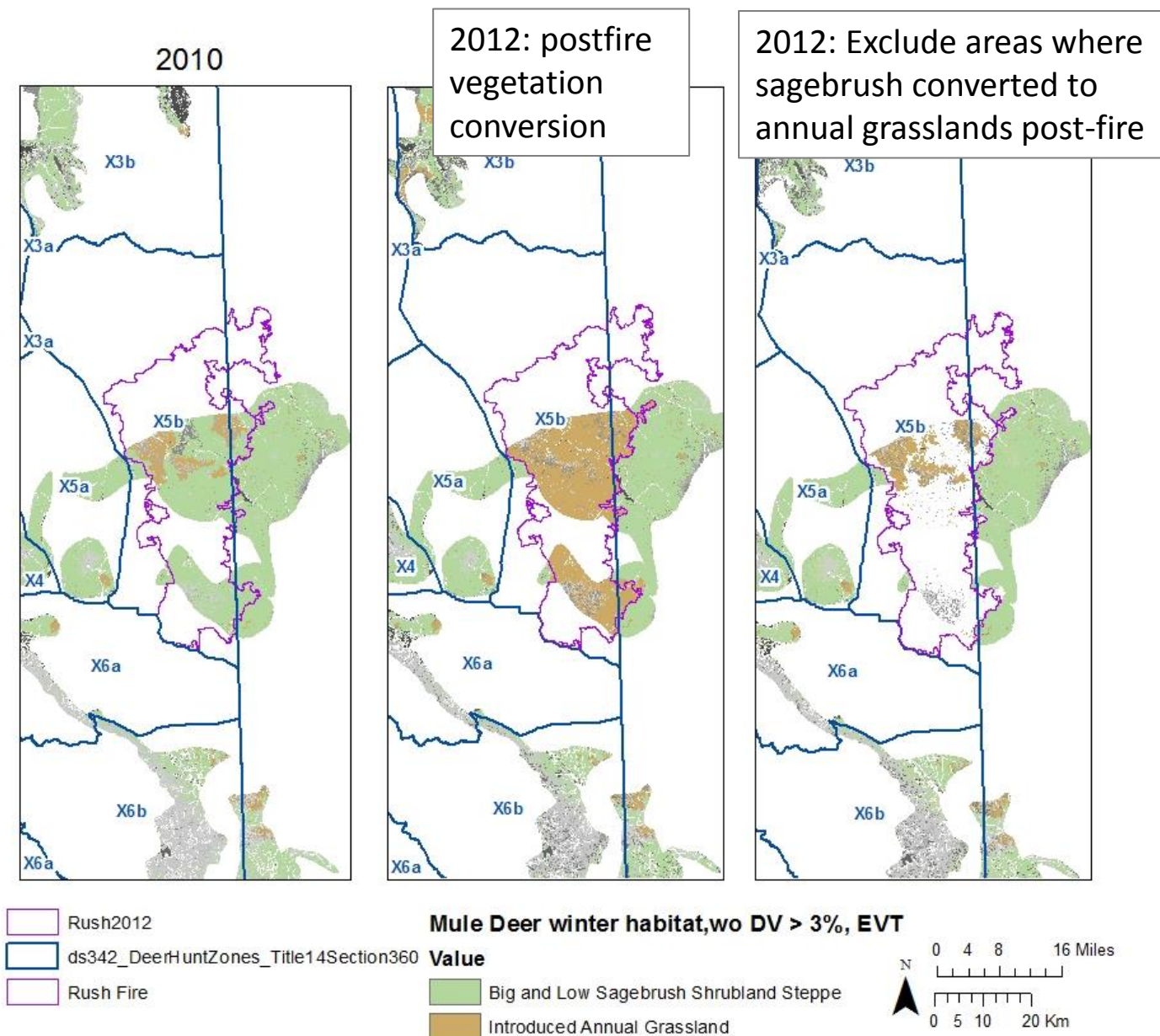
MQ: What effect did the Rush Fire have on the patch size and connectivity for pronghorn antelope habitat within the Twin Peaks allotment and within the greater landscape context?

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3 scenarios

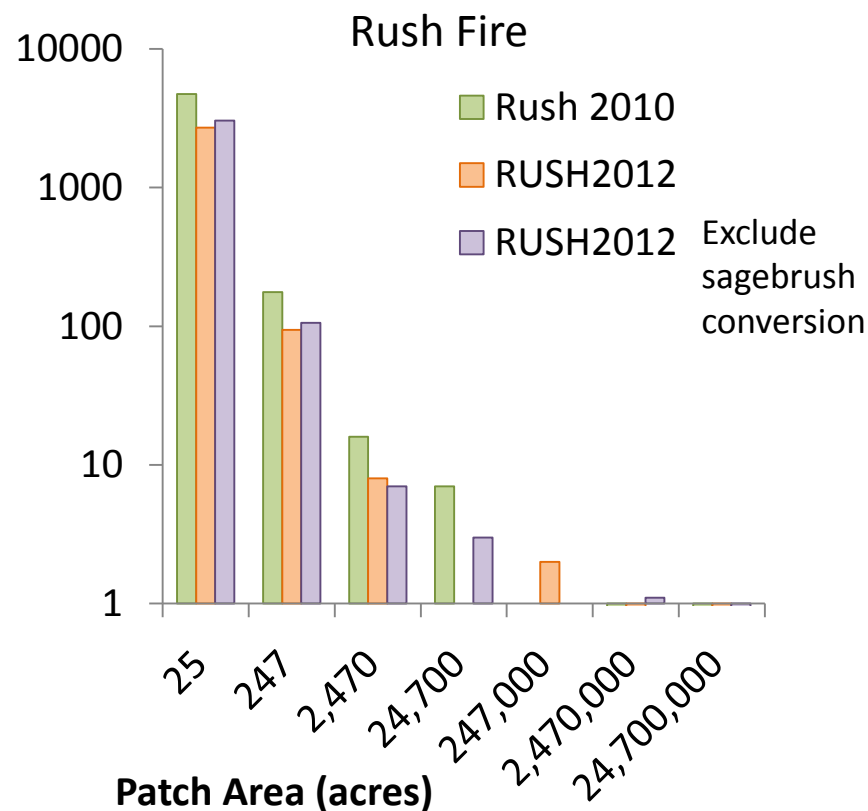
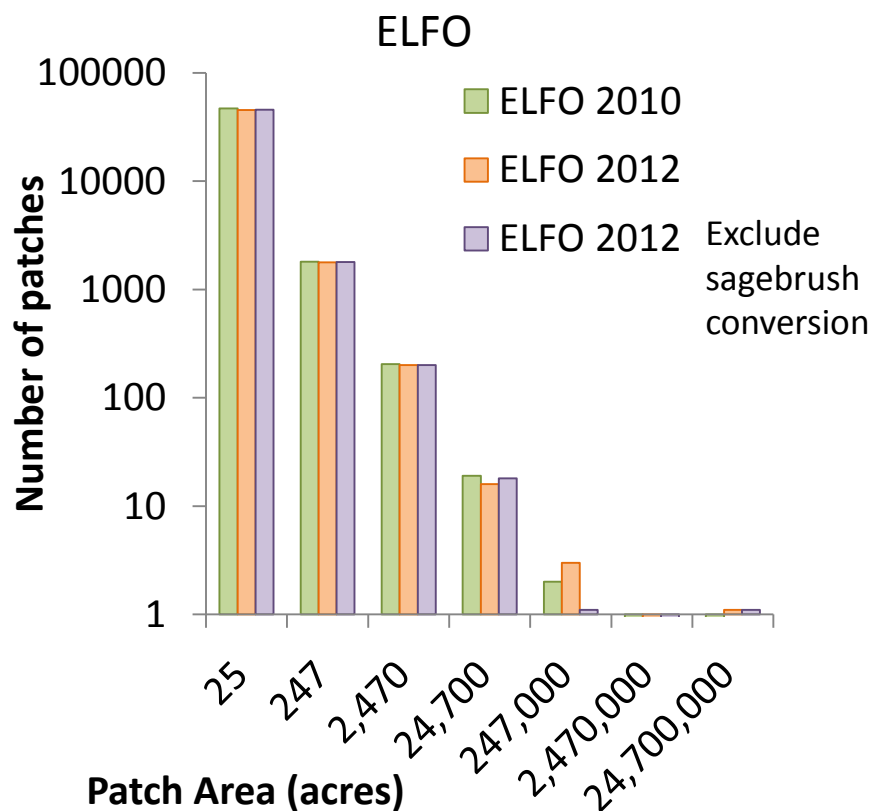
- Used LandFire EVT for 2010 and 2012 within Mule Deer winter range and winter concentration locations
- Excluded land with development > 3% (WY F&G)
- Added back in all agricultural types based on EVT (*scenarios 1, 2*)
- For 2012, excluded land where the Big or Low Sagebrush Shrubland and Steppe had changed to Introduced Annual Grassland (i.e. less preferred mule deer habitat) (*scenario 3*)

Rush Fire, Mule Deer Winter Habitat, and EVT changes



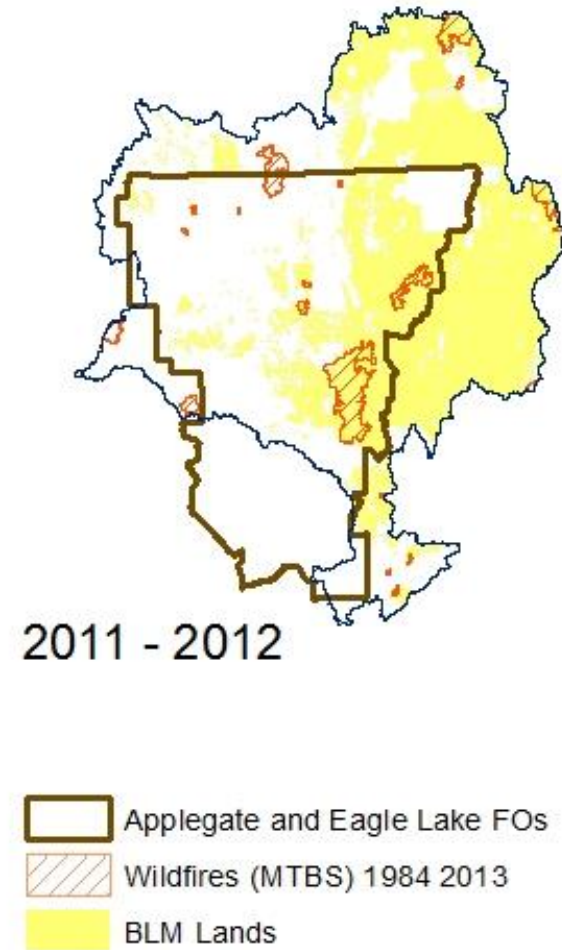
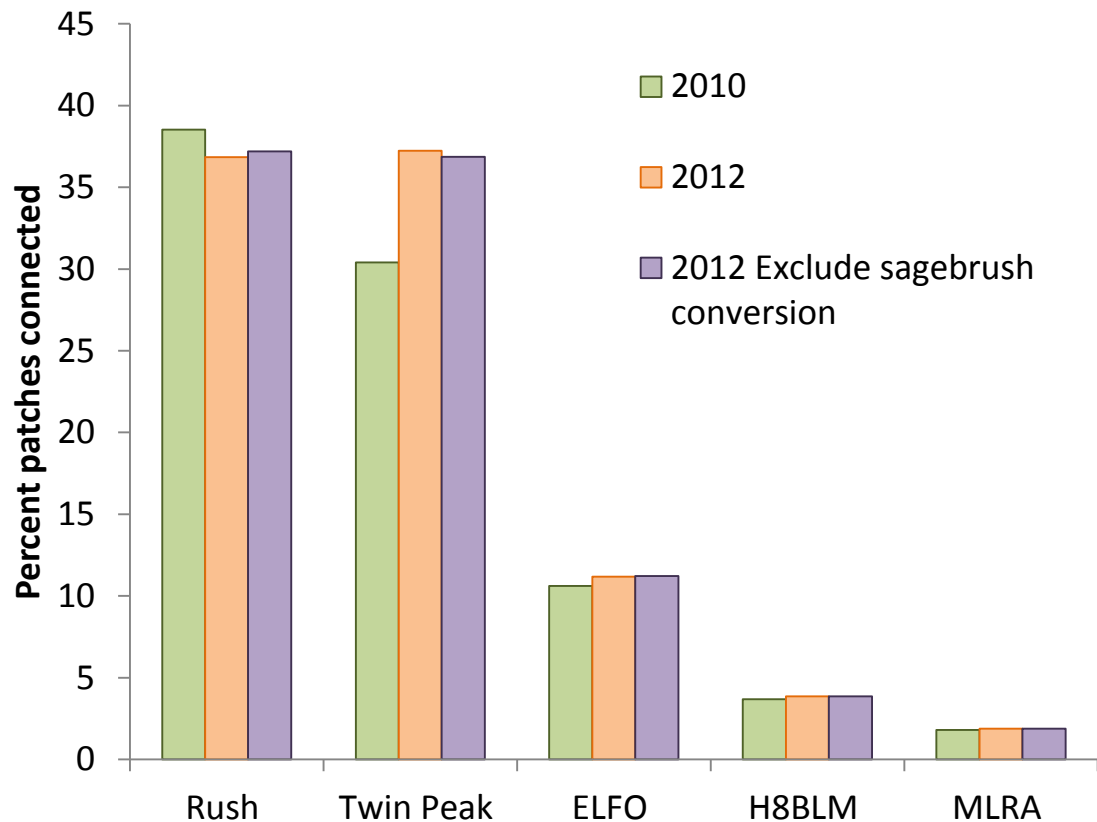
Changes in Mule Deer Winter Patch Size

scenarios: 2010, 2012, and 2012 (excluding areas where sagebrush converted to annual grasslands)



Rush Fire shows decreases in mule deer habitat overall (2012), and small increases in fragmentation where converted areas are excluded.

Pre (2010) and Post (2012) Rush Fire and Mule Deer Winter Habitat Connectivity at 7 miles or 12k



Rush Fire shows a general decrease in habitat connectivity post fire. Other areas are mixed and this may result from other fires and other changes in the 2 years between LF data sets. Larger areas show less effect as a smaller proportion of the area has burned.

Effects of Rush Fire on Mule Deer

Discussion

- What were the changes after the Rush Fire?
 - Increased fragmentation, decreased connectivity at the scale of Rush Fire
 - For larger areas, the effects of the Rush and other fires are less apparent
 - What other landscape scale changes may have happened in 2011-2012?

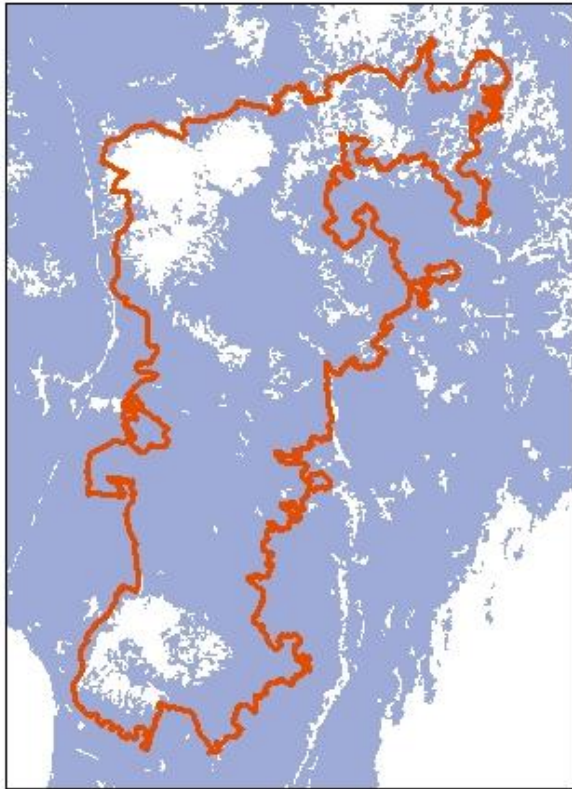
MQ: What effect did the Rush Fire have on the patch size and connectivity for pronghorn antelope habitat within the Twin Peaks allotment and within the greater landscape context?

- The hypothesis: pronghorn habitat increased due to a major loss of shrubs
- The question: by how much?
- Analysis solution: NGB REA Pronghorn habitat model
 - Variables: Vegetation*, road density, terrain (elevation, slope)
 - Run for prefire (EVT 2010) and postfire (EVT 2012) (NGB originally used EVT 2008)

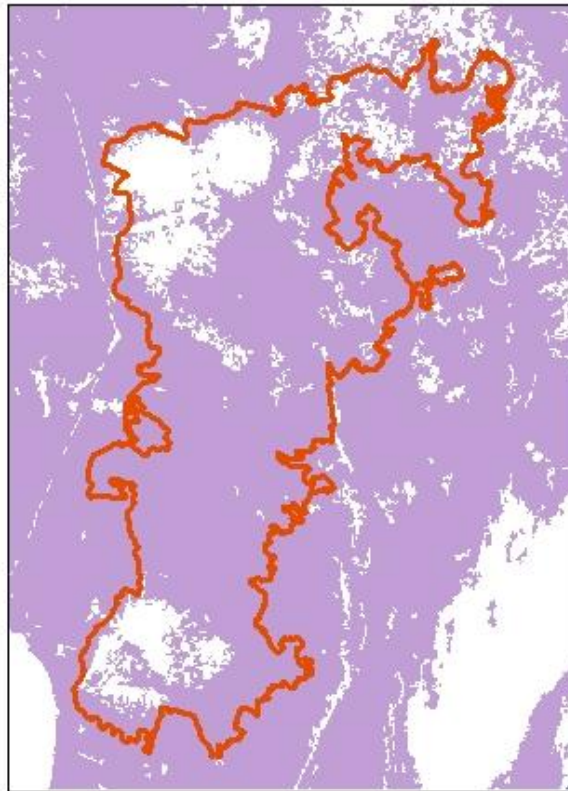
*Vegetation is the only variable that changes over the three model runs

Pronghorn Habitat at Rush Fire

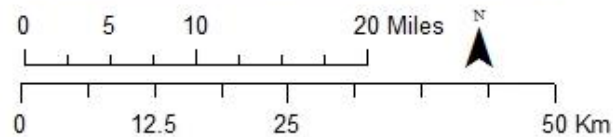
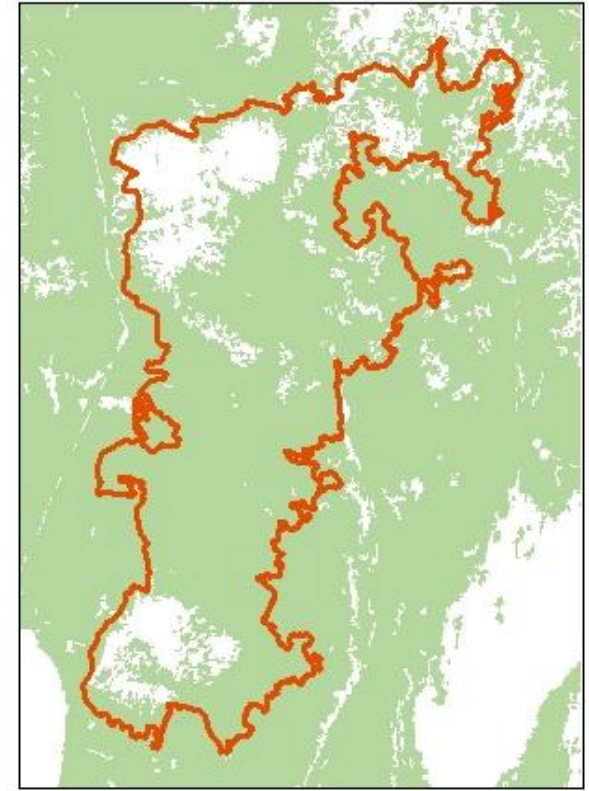
NGB EVT2008



Prefire EVT2010



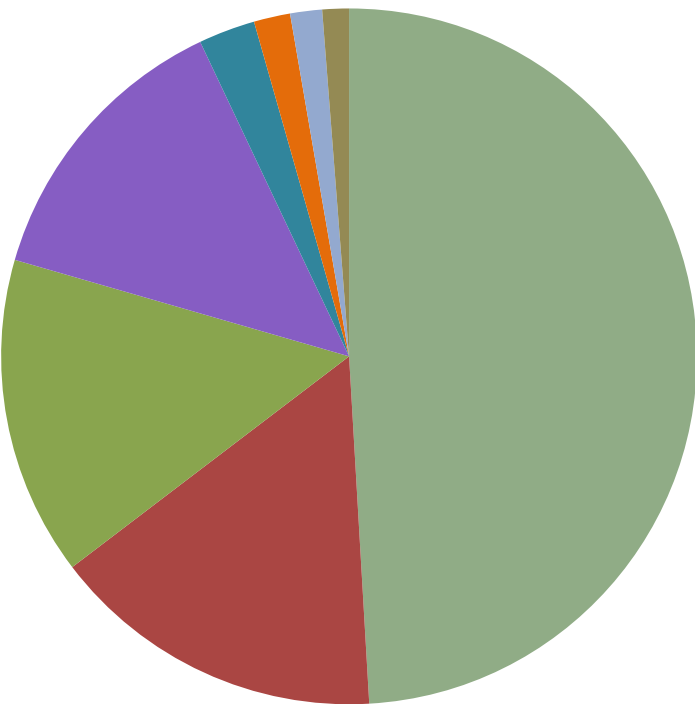
Post-fire EVT2012



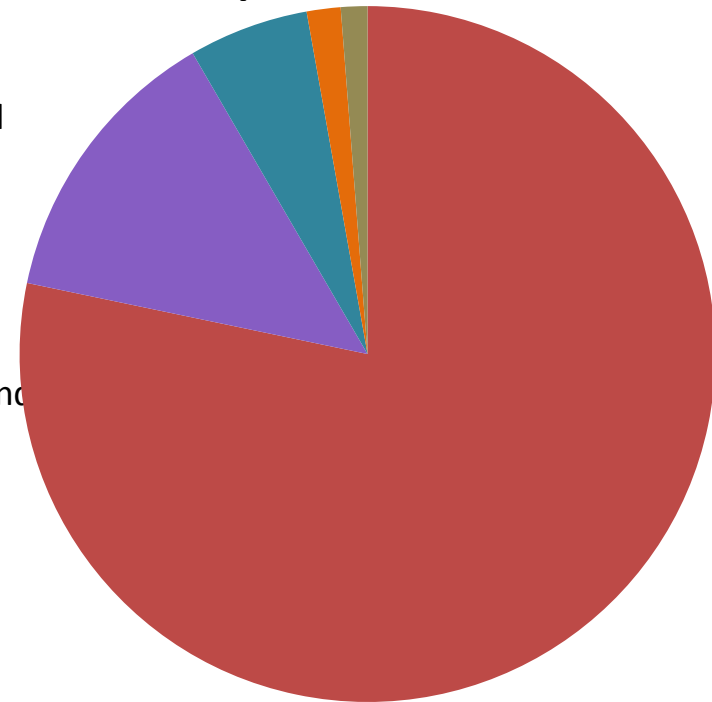
The 3 model runs for 2008, 2010, and 2012 show very similar results.
Need to understand how the NGB Pronghorn habitat model uses EVT to understand why.

Using LandFire EVT to determine post-fire changes in vegetation: Rush Fire 2012

Rush pre-fire EVT 2010



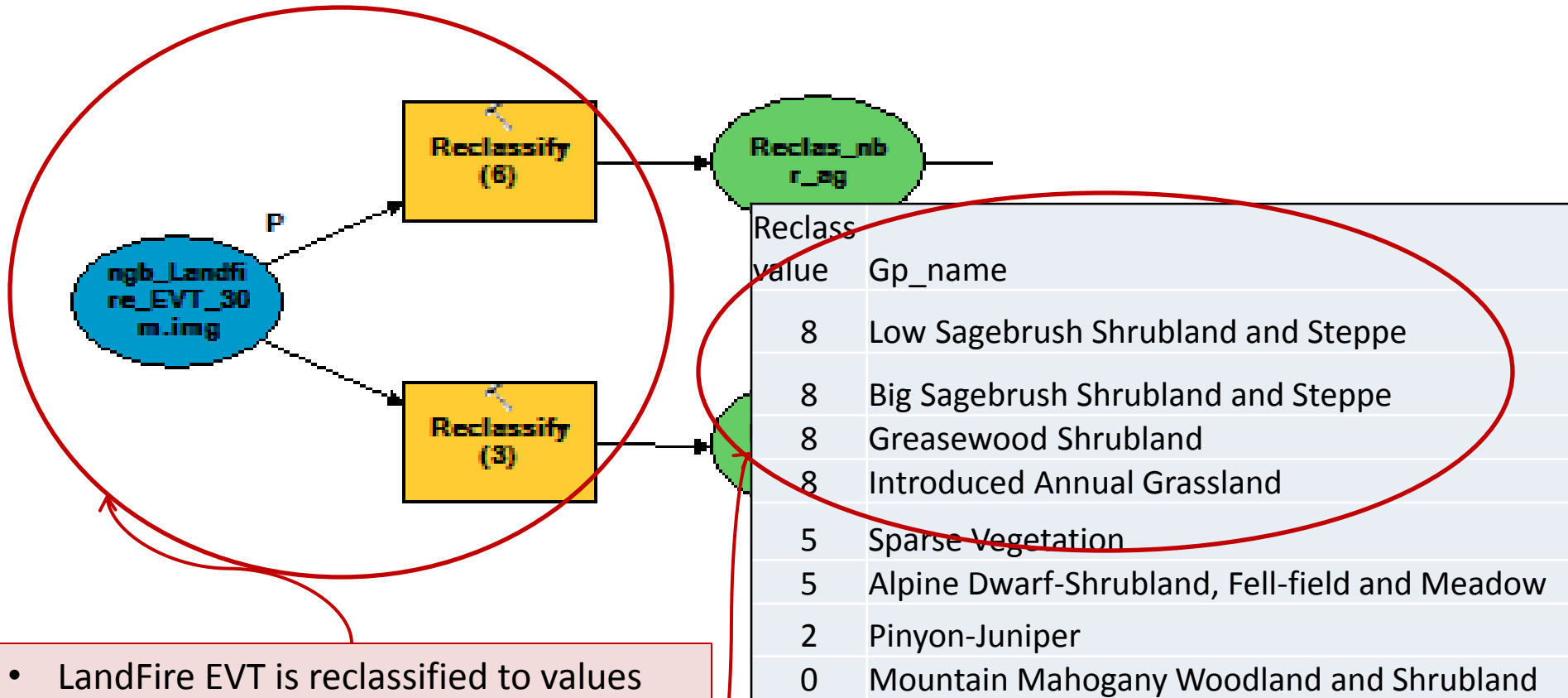
Rush post-fire EVT 2012



Major post-fire changes are from Big Sagebrush and Low Sagebrush to Annual Grassland
Greasewood shrubland disappears
Need to translate to NVCS from LandFire group names

EVT reclassification to NGB pronghorn habitat model values

Dominant vegetation groups



- LandFire EVT is reclassified to values that indicate pronghorn veg preference
- Values for the converted dominant veg groups are the same
- Which is why we don't see a major change in pronghorn habitat post-fire

Effects of Rush Fire on Pronghorn Habitat

Discussion (1 of 2)

Literature v. FO local knowledge?

- Prefer sagebrush, grasslands, and other shrublands (Kindschy et al. 1982)
- Forage cheatgrass early spring but this is low in nutrients (WAFWA)
- Shrub cover is correlated with pronghorn density and fawn : doe ratio (Irwin and Cook, 1985)
- Benefit from increases in low sagebrush (ELFO-RMP)
- May thrive on vegetation in a subclimax condition with a mixture of forbs, grasses, and browse (Kindschy et al 1978).
 - i.e. postfire and seasonal grazing patterns of pronghorn in association with bison, elk, and/or deer.
 - Pronghorn and bison in particular may have been symbiotic: Bison grazed grasses heavily which in turn stimulated growth of forbs and browse used by pronghorn

Effects of Rush Fire on Pronghorn Habitat Discussion (2 of 2)

- Several researchers recommend prescribed burning to improve pronghorn habitat
- Nutritional benefits of fire may last up to 4 yrs. postfire (depending on species)
- E.g., 6,000 acres burned Hart Mtn. National Antelope Refuge.
 - Pre-fire, sagebrush cover was over 50% and averaged 30 in height – no pronghorn use
 - Postfire, pronghorn use in the first year and for next 11 yrs.
- What else can ELFO tell us about local pronghorn preferences?
- Should the MQ be more specific as to seasonal habitat uses and preferences?
- Should this question be asked using local scale data or different broad scale data?
 - LandFire EVH?

Questions?

