The Effect of Fences on Greater Sage-Grouse Within Two Small Populations in Southwestern Utah

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Greater Sage-grouse *(Centrocercus urophasianus)*

Sagebrush obligate species

Sexually dimorphic

Competitive mating display (Lek)

Photo Credit: Todd Patrick

LEK

Photo Credit: Cheyenne Burnett

Decline

"Warranted but precluded" in March 2010, meaning that there is enough scientific evidence to list the species, but that species with a higher potential for extinction are being made the priority

Alteration of sagebrush implicated as important cause of decline

Alteration can include direct conversion, urbanization, infrastructure, wildfire (or lack thereof), invasive plants, grazing, and energy development

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FENCES

Fences

Common infrastructure found throughout sage-grouse habitat

Photo Credit: Kole Stewart

Fences

Pose two main mortality risks to sage-grouse:

Collision (direct)

Photo Credit: Kole Stewart

Collision

Fences

Pose two main risks:

Collision (direct)

Avian Predator Perches (indirect)

Fences

Fences

Pose two main risks:

- Collision (direct)
- Avian Predator Perches (indirect)

Fences are typically built to denote property ownership or in association with livestock grazing

Fence densities reach 2-km/km^2 throughout most of sage-grouse habitat

Similar study in southeastern Idaho found 86 sage-grouse collisions in 2 years during breeding season (Stevens 2011)

Stevens found main causes of collision to be:

- Terrain ruggedness (flatter topography)
- Distance to lek

Research Questions

Are sage-grouse colliding with fences ?

What are the factors that affect collision rates

Are there any fence modifications that can increase visibility and thereby decrease mortality

Are there fence types, designs, and placements that decrease raptor and raven likelihood of perching in sage-grouse habitat?

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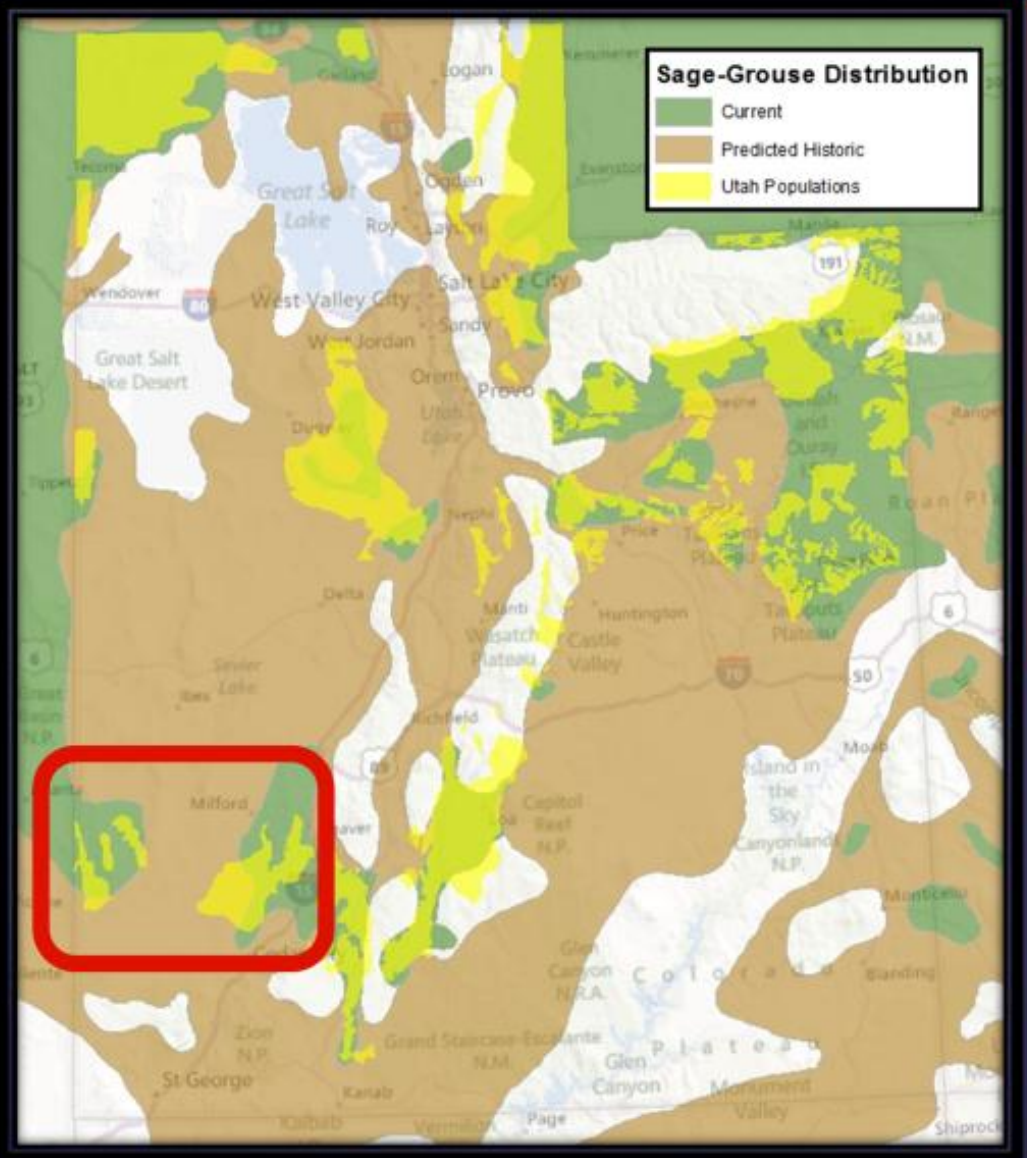
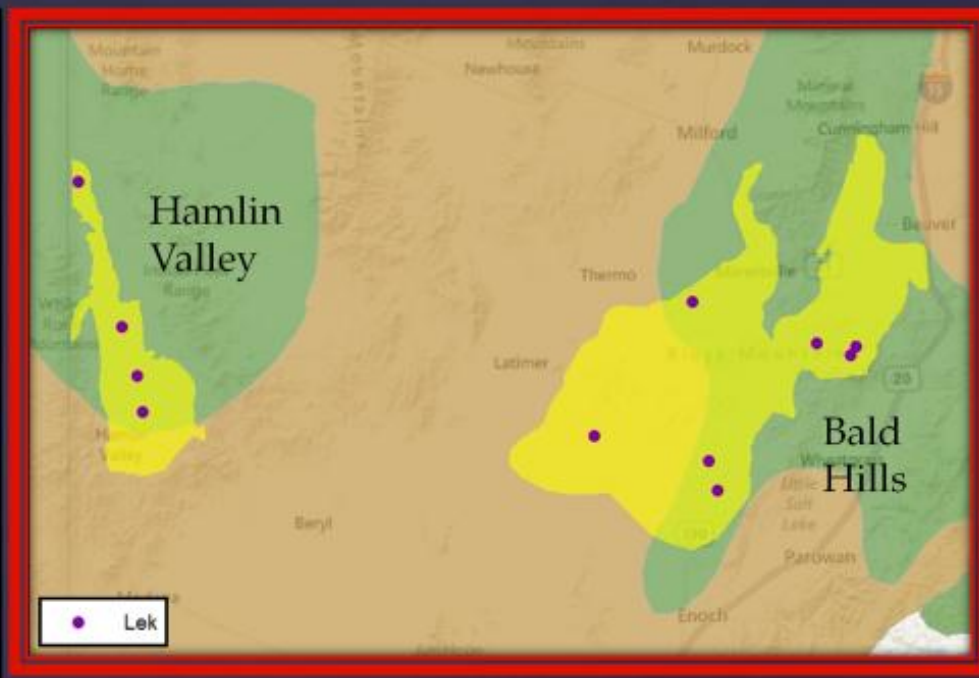
Sage-grouse Distribution

Sage-grouse Distribution

Utah Distribution

Hamlin Valley & the Bald Hills





12 leks

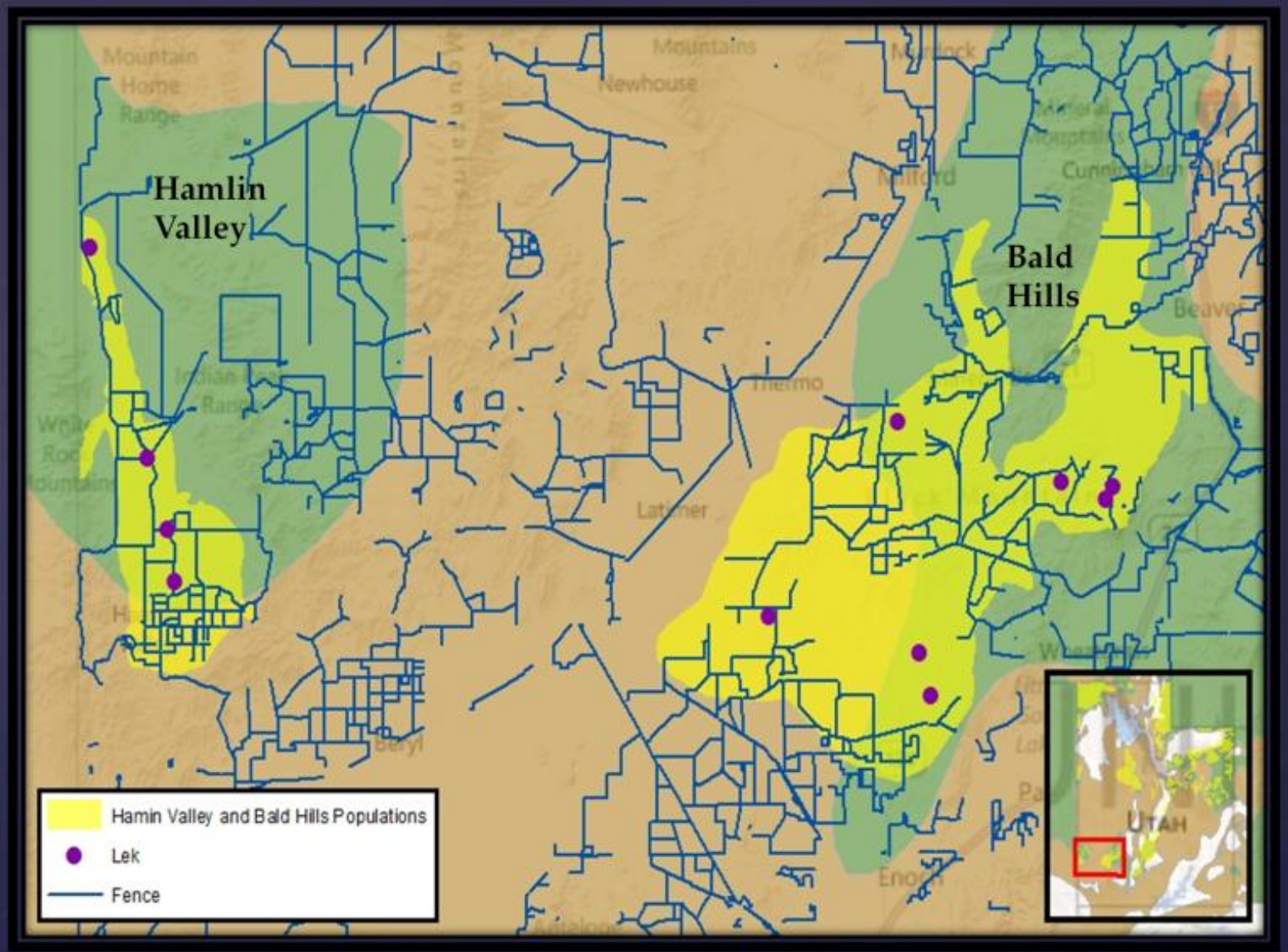
Approximate population = 375 grouse

Fence Distribution

Fence density

Hamlin Valley = 0.615 km/km^2

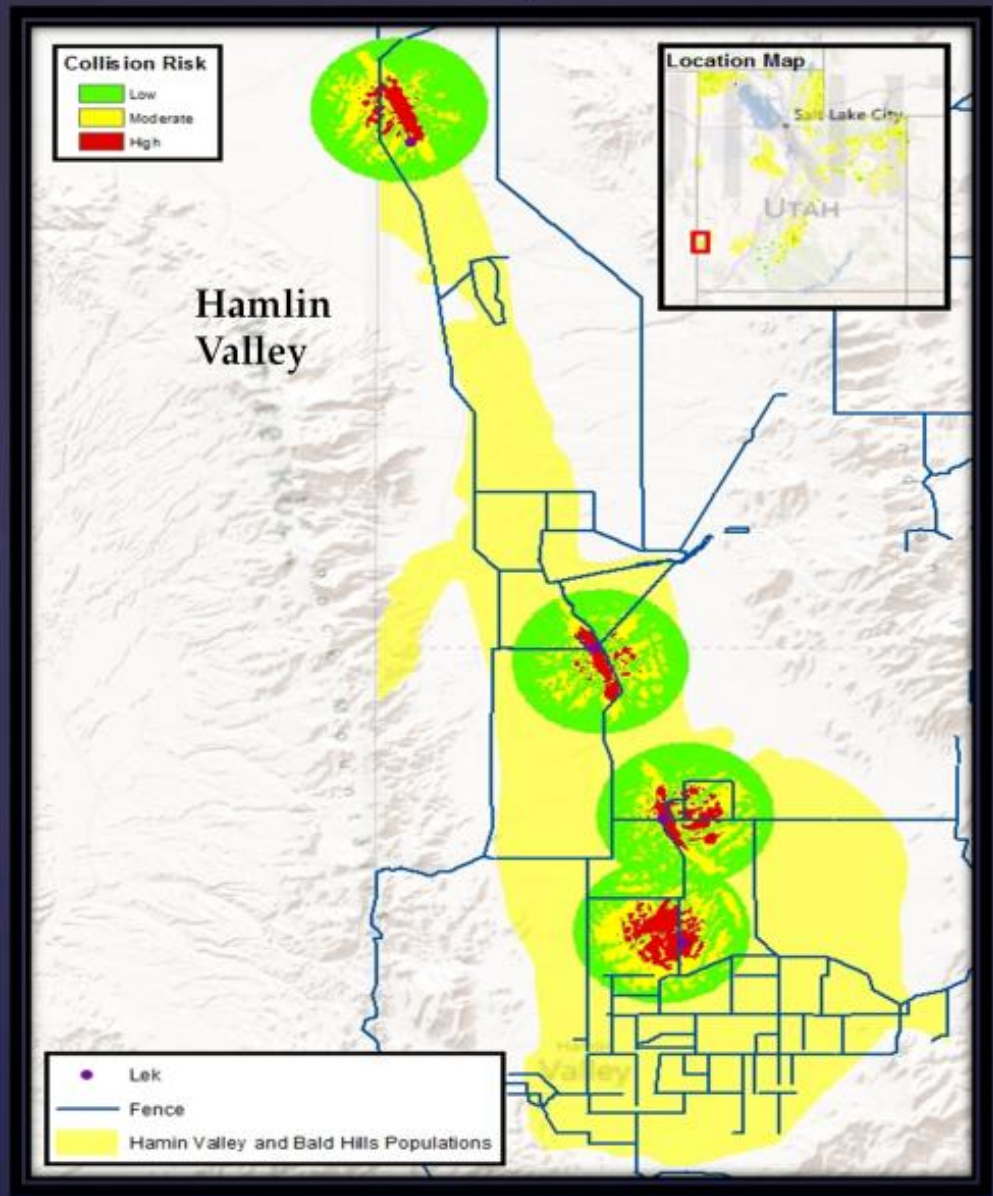
Bald Hills = 0.424 km/km^2



Collision Risk (based on Stevens et al. 2011)

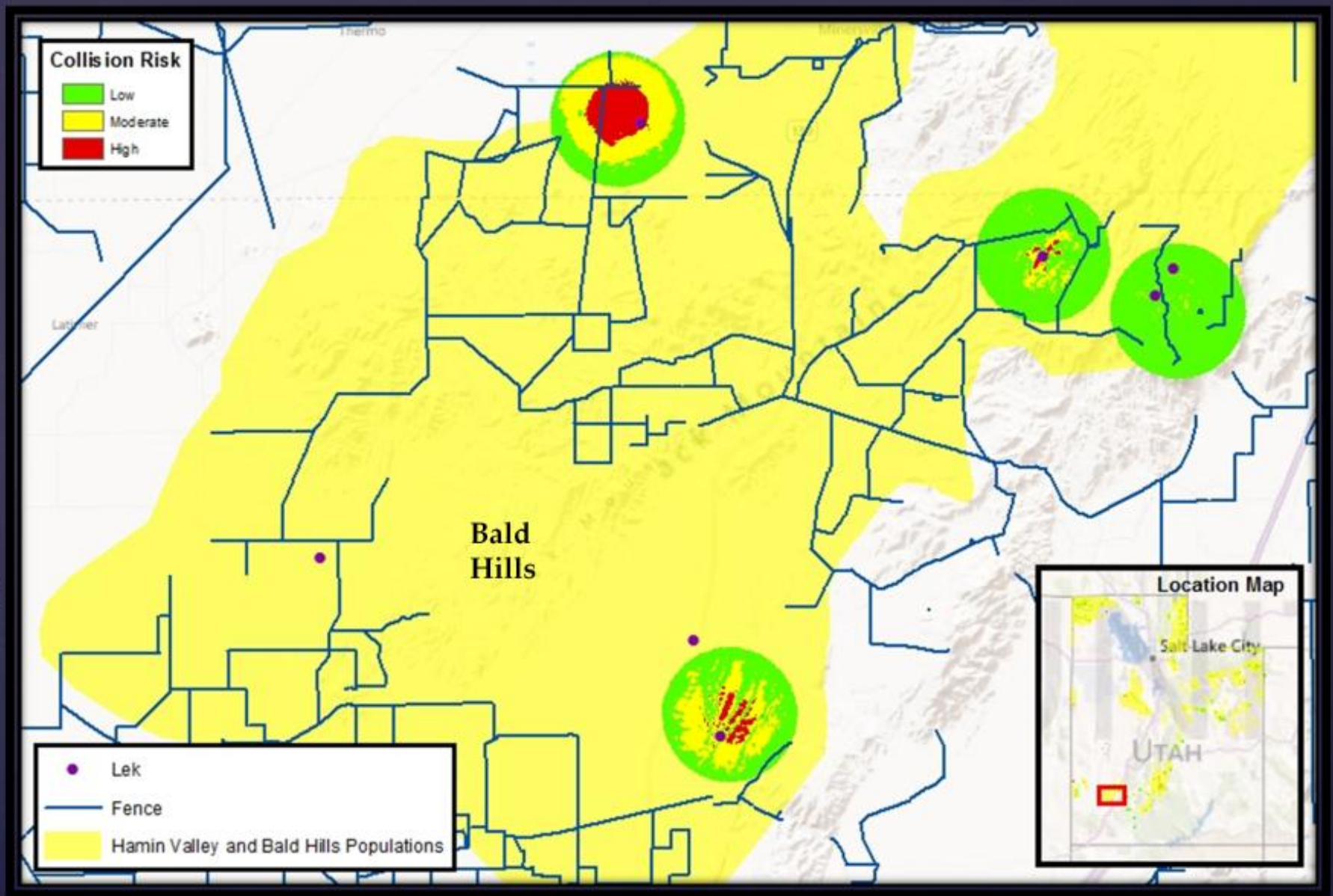
3 of the 4 leks in Hamlin Valley – have fences associated with a major collision risk immediately adjacent to the lek

1 lek – high collision risk, but further from lek center



Collision Risk (based on Stevens et al. 2011)

Much less collision risk posed from fences near leks



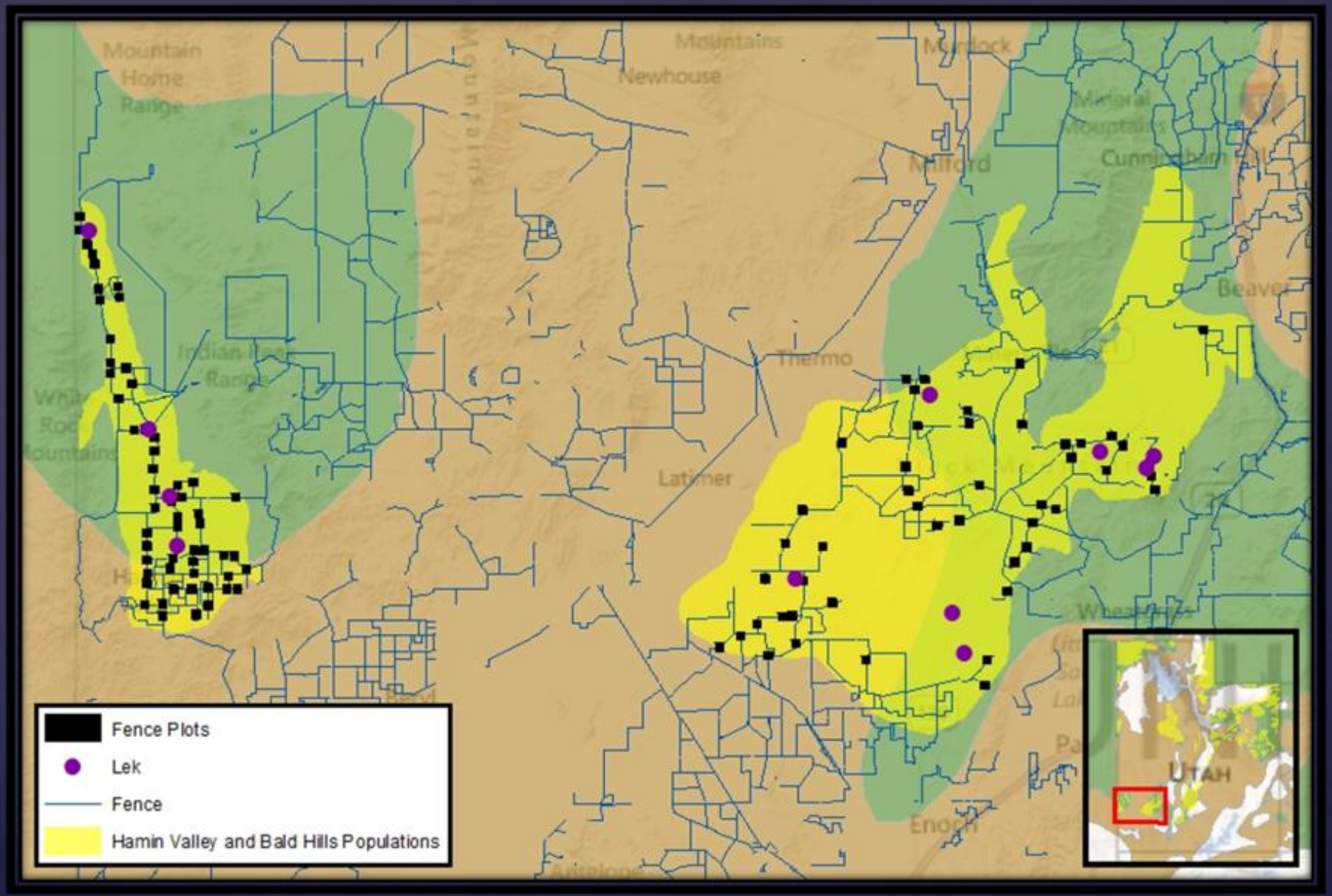
Plot Selection

Brood-rearing, Fall, and Winter

100 Random 1x1-km plot

60 – Hamlin Valley
40 – Bald Hills
} Time Allocation

Plot Selection



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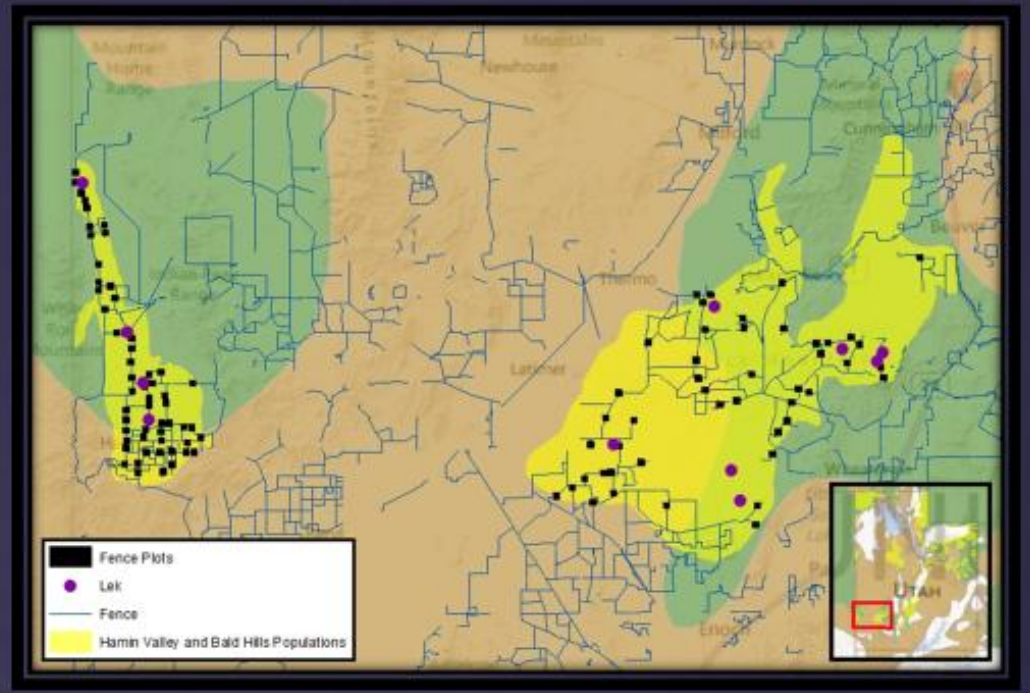
Lekking

All fences within 1.5-km of LEK



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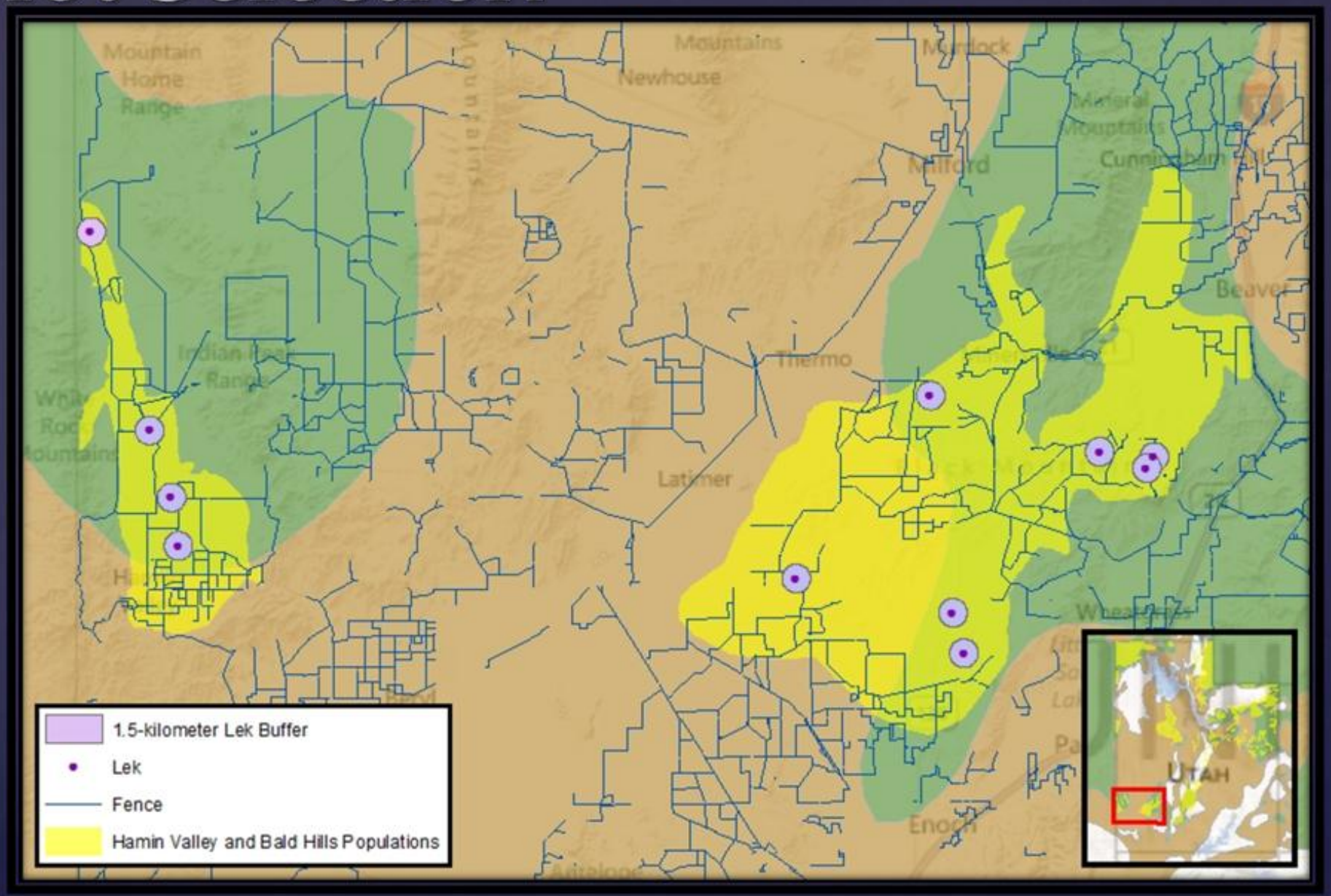

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Lekking

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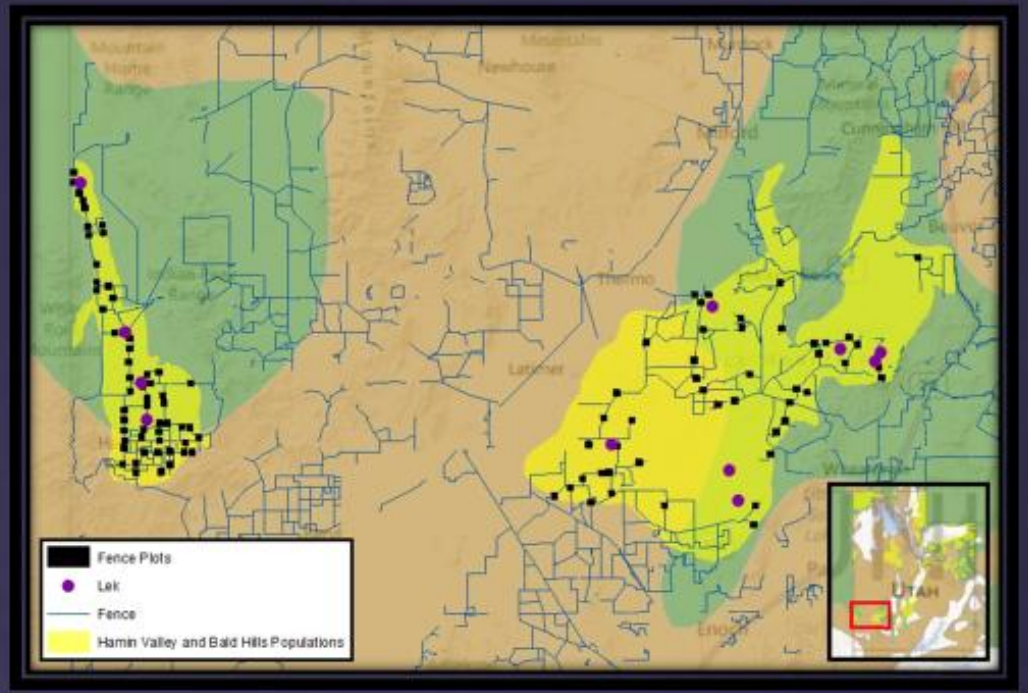
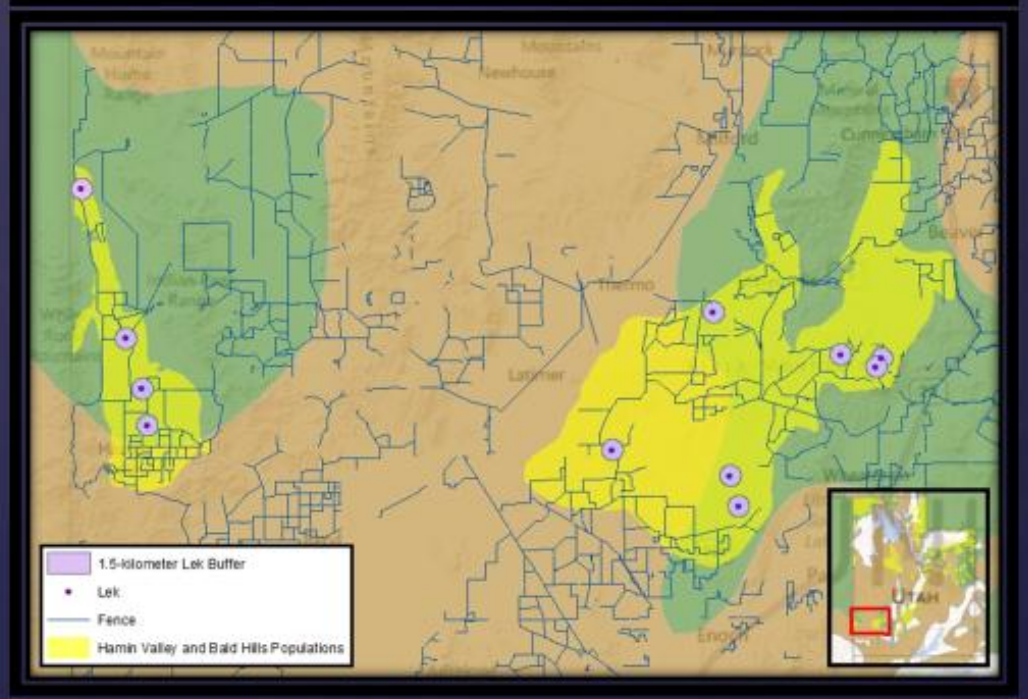
Observation methods the same for both





Observation methods

One observer walks both sides, or two observers walk each side simultaneously

Positive collision signs:

- Carcass
- Pile of feathers within 15-meters of fence
- Feathers on fenceline


Photo Credit: Sage-grouse Initiative


Photo Credit: TNC - Idaho


Photo Credit: Stephen Bodio

Survey Summary

Season	Timing	Number of times surveyed	Total kilometers of fenceline surveyed
Brood-rearing	June	1	140.17
Fall	September-October	1	140.17
Winter	December-January	1	58.9
Lekking	March-April	2	62.8

Collisions

Brood-rearing, Fall, and Winter

One bat
Three birds (2 pinyon jays and 1 owl)
No Sage-grouse!

Lekking

7 leks are situated around fences and yet still no collisions of any species observed

Conclusions

Sage-grouse in the Bald Hills and Hamlin Valley populations are colliding with fences at a very small rate that leads to non-detection

With no collisions, unable to determine the factors that cause collision in these populations and unable to determine modifications that could increase visibility to decrease mortality

It may not be cost effective for land managers in small populations to focus efforts on modifying existing fences to reduce grouse collision mortality

?

Conclusions

In other studies, fence marking has been shown to reduce collision of sage-grouse (Stevens 2011)

Can be beneficial to other species as well, avian or not

If funds available – highly recommend, cheap fix to a common problem

Photo Credit: Sage-grouse Initiative

Photo Credit: Sage-grouse Initiative

Avian Predator Perches

Possible indirect problem posed by fences

In particular – provide perch spots for raptors to hunt adults, juveniles, and chicks & for ravens to find nest spots and depredate eggs

Question: Are there fence types, designs, and placements that decrease raptor and raven likelihood of perching on fencepost in sage-grouse habitat?

Avian Predator Perches

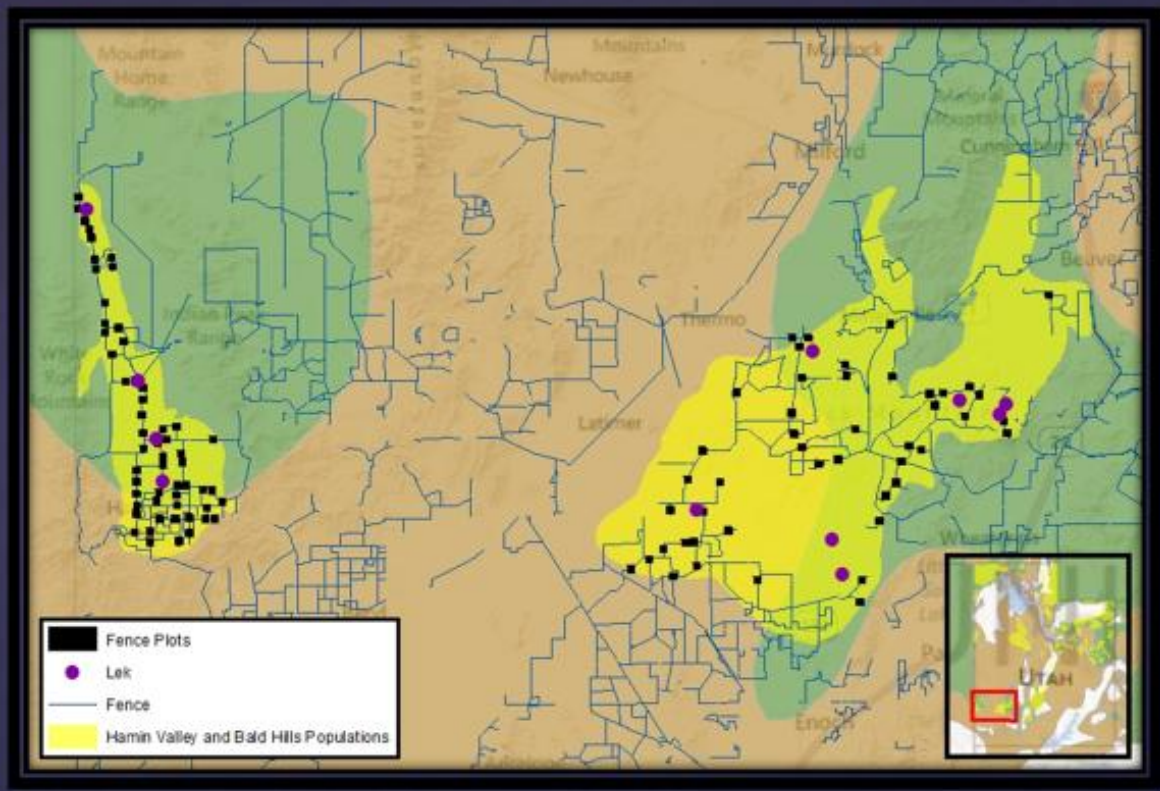
Plot Selection: Used same plots as those surveyed for collision

Methods: Surveyed all fences posts for sign of raptor raven use:

- Actual perching event
- Feather
- Whitewash
- Sign of predation – bone/carcass at base of fence post
- Raptor cast

Fences classified as high, moderate, or low predator use then measured characteristics of poles within the high and low use

Status: Field data collected, awaiting spatial data and analysis



Avian Predator Perches

Characteristics Measured: Height of pole from ground, type of pole (wood, t-post), color, width of fence span, density of surrounding shrubs, direction of fence, distance to water and nearest natural perch

Management Implication: Determine if fence design, location, or revegetation contribute to perching

Questions?

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