

# Proposed Project – White Mountain Wolf/Livestock Interactions

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# Impetus for Project

- Wolf depredation causes hardship for producers
- Non-lethal effects can also lead to negative effects
- Existing programs can financially compensate for depredations
  - Underestimate losses



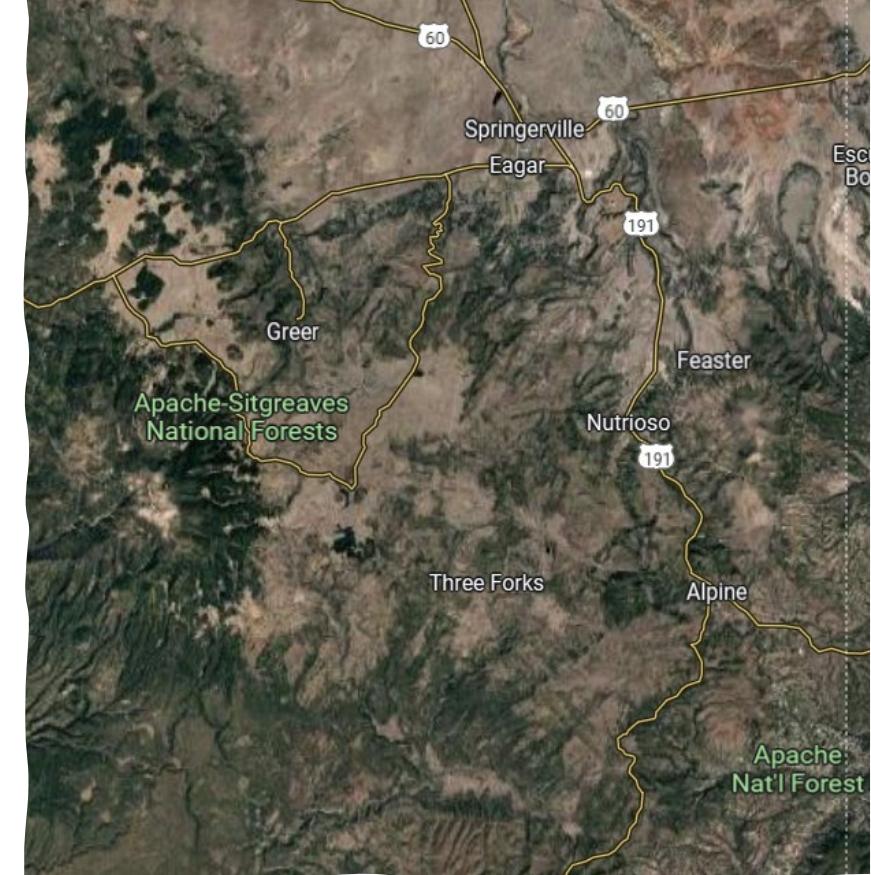
# Goal of project – Pay for Presence Model

- Collect data on non-lethal effects of wolf presence
- Put numbers to these losses
- Inform model to proactively compensate producers for wolf presence

# Study Area – White Mountains

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- White Mountain region has greatest density of wolves in Arizona
- Many livestock operations utilize high mountain summer forage and low elevation winter pasture



# Wolf Location Data

- Hierarchical dataset of wolf presence
  - GPS location data
  - Camera grid system
  - Range rider data



# Cattle Location Data

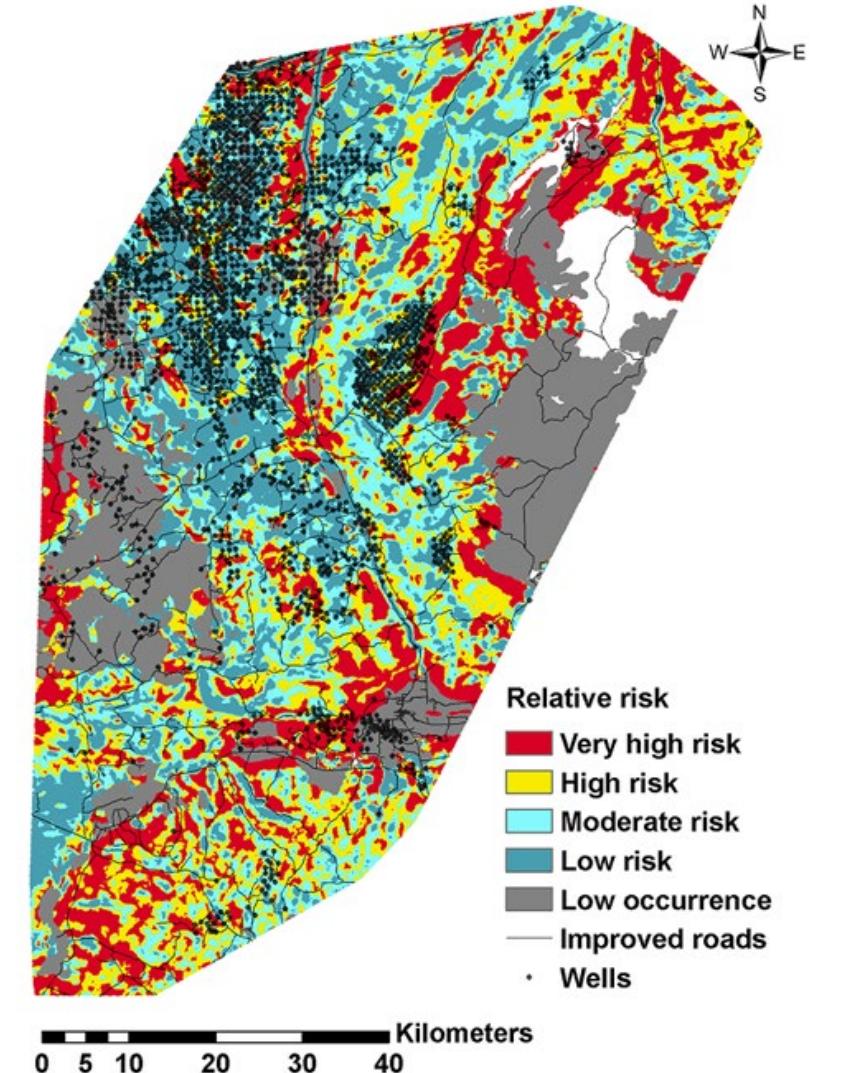
Ear tags

Virtual fence  
collars



# Behavioral Responses

- Regional livestock habitat analysis to compliment wolf habitat predation work (AZGFD)
  - Map high risk areas
  - Use areas of lower forage quality?
- Herd dynamics
  - Form groups to decrease predation risk
    - Suboptimal distribution and overuse of range
- Movement dynamics
  - Flight events - increased speed, decreased sinuosity
    - Can reduce foraging efficiency



Example habitat risk analysis map from Smith et al. 2014

# Behavioral Responses

- Fear of predation can lead to lower feeding efficiency
- Vigilance
  - Reduces foraging time -> lower feed efficiency
- Increased bite rate of lower quality forage to compensate for reduced foraging time
  - Reduce ingestion of nutrients

# Physiological Responses

- Behavior responses can lead to negative physiological effects that influence the bottom line
- Collect data on:
  - Conception rate
  - Birth/weaning weights
  - Body condition
  - Stress levels (fecal cortisol)
    - Can affect meat quality

# Resource Responses

- Behavioral changes due to wolf presence may affect range condition
- Overuse of “safer” areas or suboptimal habitat
  - Lower carrying capacity of pasture
  - Reduced animal productivity
- Measure range condition
- Quantify amount of forage lost



# Economic Impact Analysis



UA Agricultural Resource  
Economics Team



Put dollars to data



Explore viability of a pay for  
presence model

# Current Project Status

- Aiming to submit proposal to UDSA NIFA Risk Management Education Grant (November)
  - Depends on federal funding status
- Looking for more ranches to participate in project
  - Increase sample size and broader scope
  - Would require monitoring of livestock
  - May require management shifts to facilitate proper study design
    - Information gained may not immediately alter livestock or predator management activities

# Questions?

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