

SA Species

Species closely associate with shrub-steppe landscapes in the Intermountain West

Birds (30)

*Upland species

- Sharp-tailed Grouse
- Ferruginous Hawk
- "Prairie Falcon"
- Long-billed Curlew
- Burrowing Owl
- Loggerhead Shrike
- Gray Vireo
- Horned Lark
- Virginia's Warbler
- "Chipping Sparrow"
- Lark Sparrow
- Black-throated Sparrow
- Savannah Sparrow
- "Grasshopper Sparrow"
- "White-crowned Sparrow"
- "Western Meadowlark"
- "Brewer's Blackbird"
- Scott's Oriole
- Yellow-billed Cuckoo
- "Belted Kingfisher"
- "Willow Flycatcher"

*Riparian Species

- Veery
- "Swainson's Thrush"
- "Orange-crowned Warbler"
- Nashville Warbler
- "Yellow Warbler"
- "MacGillivray's Warbler"
- "Wilson's Warbler"
- "Song Sparrow"
- Bullock's Oriole

Small mammals (20)

*Upland species

- Merriam's shrew
- Pebble's shrew
- Pygmy rabbit
- Idaho ground squirrel
- Merriam's ground squirrel
- Pine ground squirrel
- Townsend's ground squirrel
- Washington ground squirrel
- Little pocket mouse
- "Great Basin pocket mouse"
- Dark kangaroo mouse
- Pale kangaroo mouse
- Chisel-toothed kangaroo rat

*Riparian Species

- Water shrew
- Townsend's pocket gopher
- Western harvest mouse
- "Long-tailed vole"
- "Montane vole"
- "Western jumping mouse"



White-crowned Sparrow

Dobkin and Sauder 2004

Project Goals

- Determine the contribution of high elevation sagebrush steppe to bird and small mammal species biodiversity
- Determine whether or not high elevation sagebrush provides a refuge for sagebrush obligate species



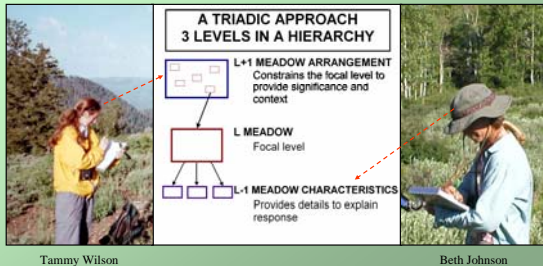
Jason Robinson, Tammy Wilson, and Joel Ulmer cleaning mammal traps



Beth Johnson, Ruth Kikkert, and Ron Daigle trapping small mammals

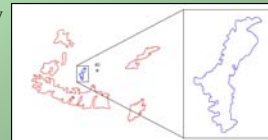
Hierarchical Framework

- Two masters theses projects answer similar questions but at different levels



The Conceptual Hierarchy

- L Project focal level is the animal community within a sagebrush meadow
- L+1 Tammy Wilson is focusing on the influence of meadow arrangement on bird and small mammal diversity and density
- L-1 Beth Johnson is examining the relationship between meadow characteristics and bird and small mammal diversity and density



Objectives

Assess the influence of meadow characteristics on bird and small mammal diversity and density of selected species

Meadow characteristics of interest include:

- Size
- Shape
- Edge
- Soil
- Vegetation



Beth Johnson collecting bird data

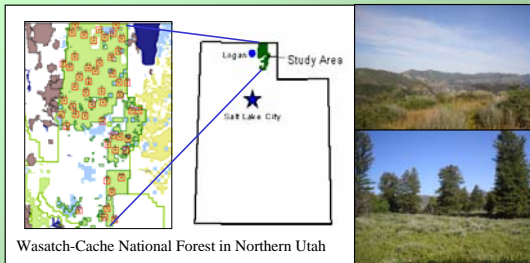
Tammy Wilson's Objectives

- Same response variables, but different set of explanatory variables
 - In her analysis she will assess the influence of meadow arrangement on bird and small mammal diversity and density of selected species
- Combining the results of our two studies will provide greater insight into the system



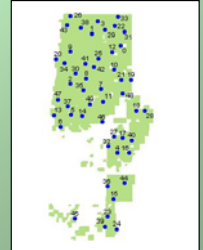
Tammy Wilson collecting vegetation data

Study Area



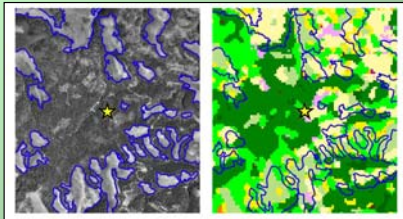
Methods

- 50 random points generated within the study area using a dispersion interval of 2500m
- Meadows in an area around the points were digitized using DOQQs
- The meadow closest to the randomly selected point was chosen as the focal meadow of interest



Methods

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- The meadow closest to the randomly selected point was chosen as the focal meadow of interest



Methods

- Meadows were sampled if they met the following criteria
 - on public land
 - contain at least some sagebrush
 - within 5km for birds or 1km for mammals of a road
 - contained within a forested matrix (evaluated using a 6 km² buffer)
 - mostly less than 50% slope
- 36 meadows were sampled for birds and 11 for mammals in the summers of 2003 and 2004
- Each meadow was sampled only once

Methods

- 2-10 sub-sample points were placed in each focal meadow
 - Sub-sample points were required to be
 - occur on a slope less than 50%
 - 250m apart
 - not in water
 - not in a group of trees



Methods

- Birds and vegetation characteristics were measured at each sub-sample point
- Mammals and soil characteristics were measured at the first 2 sub-sample points in selected meadows
- The bird and mammal data became the response variable for both L+1 and L-1 level analyses

Methods Field Protocols

- Variable distance bird point counts
- Small mammal trap webs
- Vegetation surveys
- Soil description
- 2 field seasons



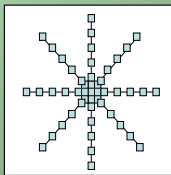
Joel Ulmer collecting bird data

Birds

- Variable distance bird point counts (point transects) conducted for 8 minutes at each sub-sample point
- The double-observer method was used for each point count
- All birds seen or heard were recorded
- Distance and bearing was measured to each bird

Mammals

- Mammals were trapped using a 50m radius trap web with 8 arms
- Sherman live traps and Victor snap traps were placed at the center, 5m, 10m, 20m, 30m, 40m, and 50m points along each arm of the web



Vegetation & Soils

- Vegetation
 - Species lists including big sagebrush down to subspecies
 - Daubenmire frames
 - Shrub cover
 - Shrub age classes
 - Dimensions of nearest shrubs
- Soils
 - Parent material off of Utah geologic map in ArcView
 - Soil augering for depth, texture, and rock type component



Balsamorhiza sagittata

Analysis

- Analysis is currently underway
- Using Program DISTANCE to generate bird and small mammal densities for selected species
- Species not abundant enough to generate density calculations are being analyzed using presence/absence
- Partners in Flight Species Assessment Scores being used to calculate CVs (conservation values)
- Intend to use SAS Proc MIXED to look at points both independently and as part of a larger meadow of correlated data points

PROTEINACEAE PL. FLIGHT

PHYSIOGRAPHIC REGION: BREEDING SCORES

SW - Utah Westlands

Source: Niles, J. (1994). Conservation Plan

Species	SW	W	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS
Great Horned Owl	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Swainson's Sparrow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Golden Plover	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mountain Bluebird	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Golden Tanager	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mountain Bluebird	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Swainson's Sparrow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mountain Bluebird	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Swainson's Sparrow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Great Horned Owl	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Meadow Variability

- Meadows appear highly variable
- 1.5 to 1930 acres
 - 29 species of graminoid
 - 67 plant species identified at only one sub-sample point
 - 5 species of *Artemisia*
 - 3 subspecies of *Artemisia tridentata*



Birds Preliminary Results

Birds Observed
3615 Total observations
70 Species identified
1 SO observed ★
3 SNOs observed ★
11 SAs observed ★

- 70 species
- Most common species
 - Green-tailed Towhee ★
 - American Robin
 - Brewer's Sparrow ★
 - Chipping Sparrow ★
 - Ruby-crowned Kinglet
 - Dark-eyed Junco
 - Mountain Chickadee
 - Hermit Thrush
 - Dusky Flycatcher
 - Western Tanager
 - Warbling Vireo
- Additional SNO/SA species
 - White-crowned Sparrow ★
 - Vesper Sparrow ★
 - MacGillivray's Warbler ★
 - Yellow Warbler ★
 - Orange-crowned Warbler ★
 - Brewer's Blackbird ★
 - Western Meadowlark ★
 - Song Sparrow ★
 - Wilson's Warbler ★
 - Swainson's Thrush ★
 - Grasshopper Sparrow ★
 - Gray Flycatcher ★

Mammals Preliminary Results

17 species

1128 animals trapped
2 SO species ★
5 SA species ★

- Deer Mouse (722)
- Least Chipmunk (178) ★
- Uinta Chipmunk
- Great Basin Pocket Mouse ★
- Red-backed Vole
- Montane Vole ★
- Long-tailed Vole ★
- Snowshoe Hare
- Golden-mantled Ground Squirrel
- Uinta Ground Squirrel
- Western Jumping Mouse ★
- Sagebrush Vole ★
- Grasshopper Mouse ★
- Northern Pocket Gopher
- Short-tailed Weasel
- Northern Flying Squirrel
- Rock Squirrel
- Long-tailed Weasel



Least chipmunk *Tamias minimus*

Summary

Preliminary observations

- 24 of 60 species of interest detected
 - 1 of 4 SO birds and 1 of 2 SO mammals
 - 3 of 3 SNO birds and 1 of 1 SNO mammals
 - 14 of 30 SA birds and 4 of 20 SA mammals were observed
- Future analyses
 - Linking meadow characteristics to species diversity and habitat-specialist presence/absence

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Questions?

