

A photograph of a hen blue grouse standing in a fenced enclosure. The bird is the central focus, with its brown and grey mottled feathers clearly visible. It is positioned behind a metal fence. In the foreground, a large, weathered log lies horizontally across the frame. The background consists of a dense green forest. The title text is overlaid on the upper portion of the image.

Factors Affecting Hen Blue Grouse Responses to Human Disturbance

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- Oz Garton
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- Taylor Ranch summer 2001 crew



Introduction

- Bergerud and Hemus (1975)
 - ◆ compared observability and distance flushed of male blue grouse between three populations
 - ◆ observations indicated cover was determining factor
 - ◆ differences were found to be not significant

Introduction

- McNicholl (1983)
 - ◆ compared reactions of male blue grouse to human intrusion
 - ◆ used tameness scale to compare individuals
 - ◆ qualitatively, birds became “tamer” with time, but could not demonstrate this quantitatively

Introduction

- Zwickel et al. (1977)
 - ◆ compared two populations of blue grouse
 - ◆ qualitatively, birds at one site were “wilder”
 - ◆ quantitative difference existed in total distance moved

Objectives

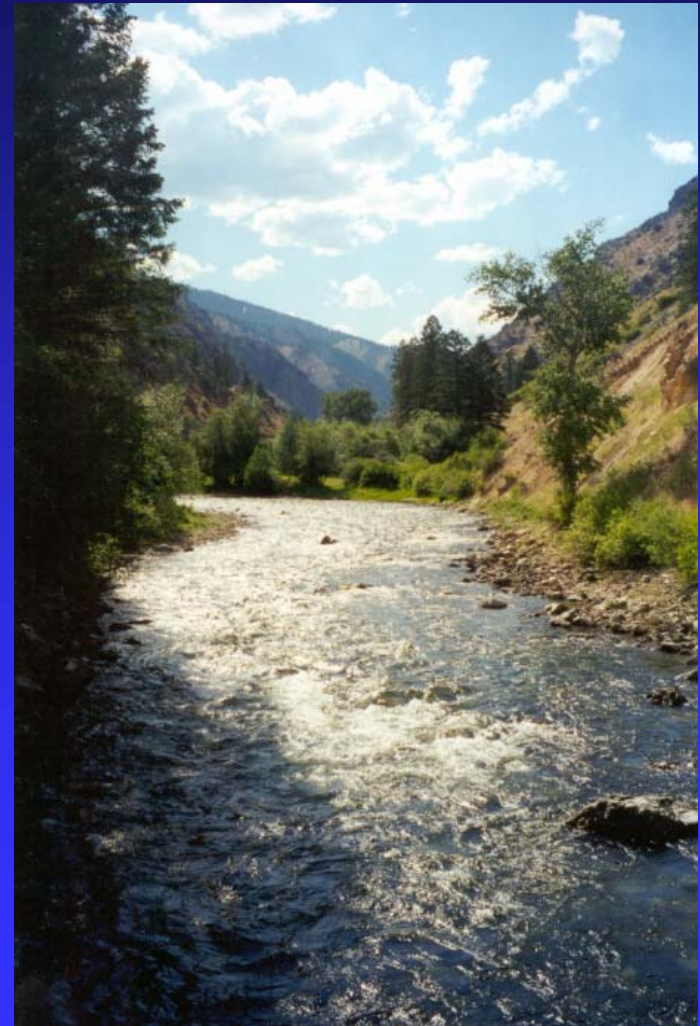
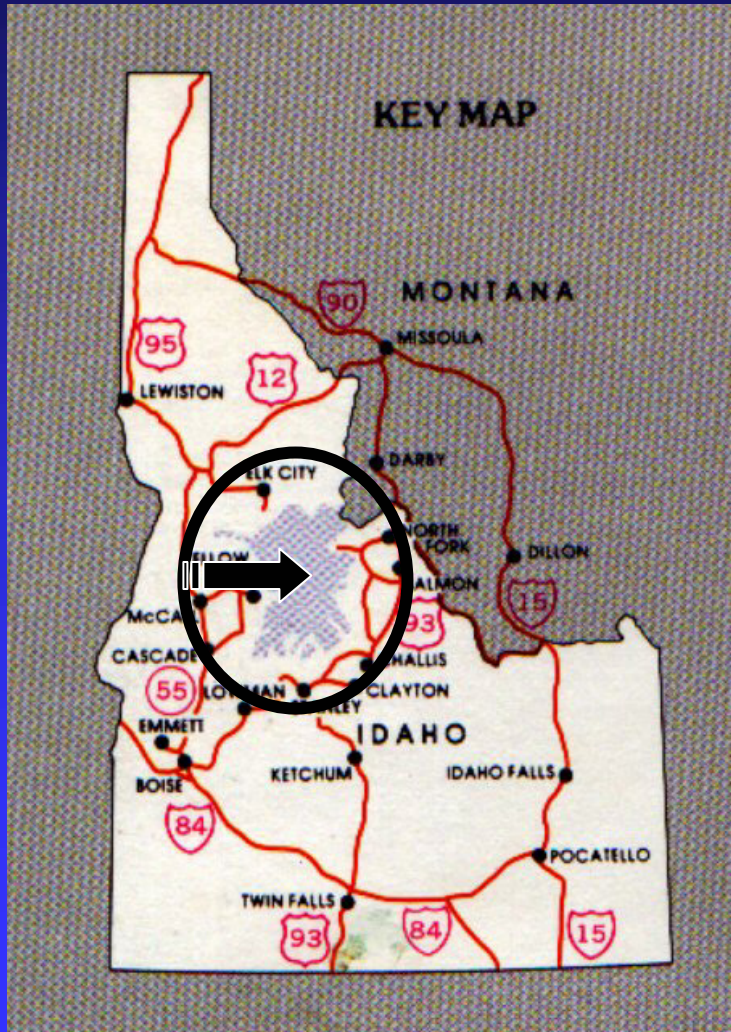
- Determine whether habituation to humans affects hen blue grouse flushing behavior
- Determine whether other factors affect hen blue grouse flushing behavior
- Determine whether these factors are significant enough to be considered when performing flushing counts

Study area

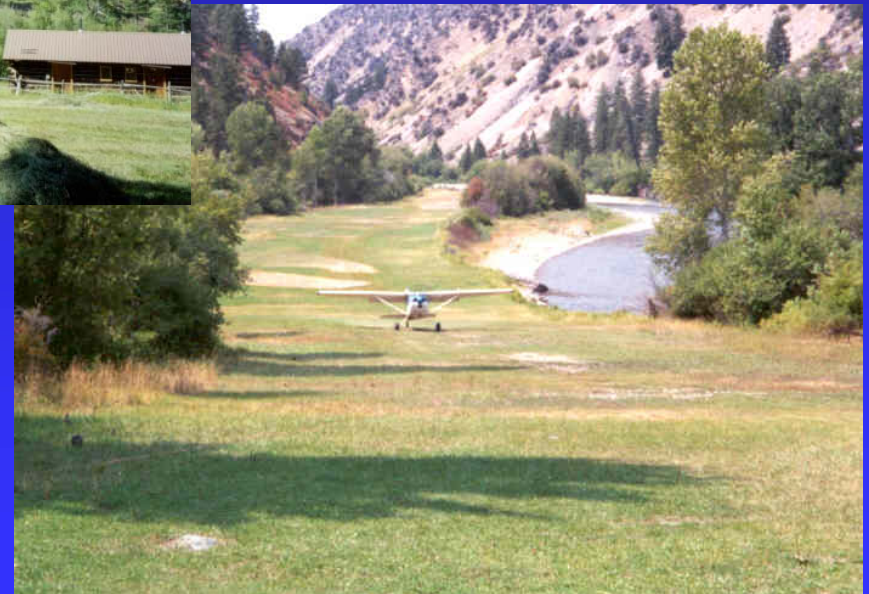
- Lower Big Creek – Frank Church-River of No Return Wilderness, Idaho
- Experimental study area – Taylor Ranch
- Control study area – Big Creek Trail



Lower Big Creek



Experimental study area



Control study area



Upstream



Downstream

Methods

- Captured and marked hen blue grouse
- Developed an actigram
- Tested hen blue grouse
- Analyzed data using SYSTAT 10



Captured and marked hen blue grouse

- Captured hen blue grouse using a noose pole
- Banded with colored, plastic leg bands
- Each individual given a unique color combination



Developed an actigram

- Over 30 behaviors identified
- Behavior categories
 - ◆ calm
 - ◆ alert/aggressive
 - ◆ escape
- Used in recording observations during testing

Bird testing

- Test bird identified.
- Observer walked directly at the grouse's original position.
- Observer dropped a marker for each identified behavior.
- Observer stopped when they reached grouse's original position.
- Observer remained still until grouse stopped moving away from observer and resumed calm behavior.
- Measured distance between grouse and observer for each behavior marked.
- Measured total distance grouse moved.
- Recorded 11 other habitat, non-habitat, and behavioral observations.

Habitat, non-habitat, and behavioral observations

- Type of bird (banded, unbanded, or control)
- Observer
- Week of study period
- Time of day
- Air temperature
- Activity prior to disturbance
- Cover type prior to disturbance
- Age of chicks
- Number of chicks
- Tameness scale score

Analysis of data

- SYSTAT 10

 - ◆ ANOVA

 - ◆ χ^2

- $\alpha = 0.10$



Hypothesis

- h_0 : Flushing behavior does not differ between birds regardless of habitat, non-habitat, or behavioral factors



Results

- 47 tests performed
 - ◆ 26 on banded birds at Taylor Ranch
 - ◆ 12 on unbanded birds at Taylor Ranch
 - ◆ 9 on control birds on the Big Creek Trail

Results

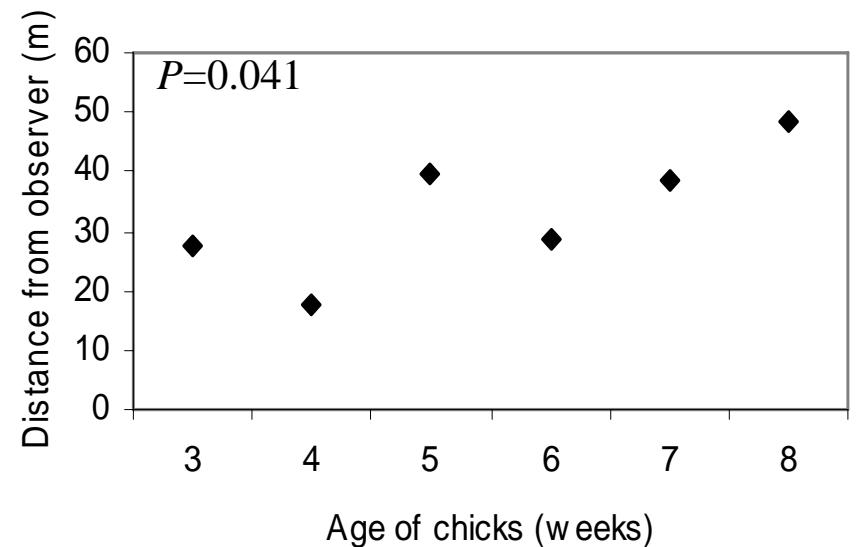
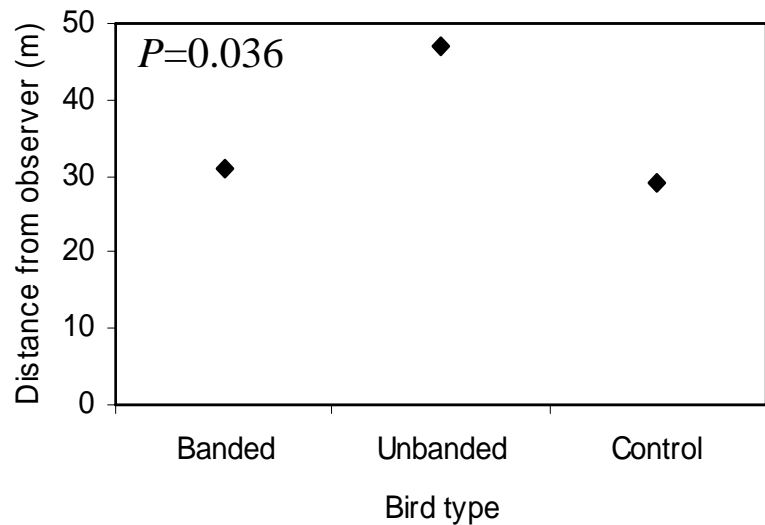
- Focus on three behaviors:
 1. distance from the observer at which an alert posture was assumed
 2. total distance moved during test
 3. whether or not a flush occurred

Alert posture

- Characterized by:
 - ◆ cessation of calm behavior (feeding, preening, etc.)
 - ◆ head upright
 - ◆ often looking at observer



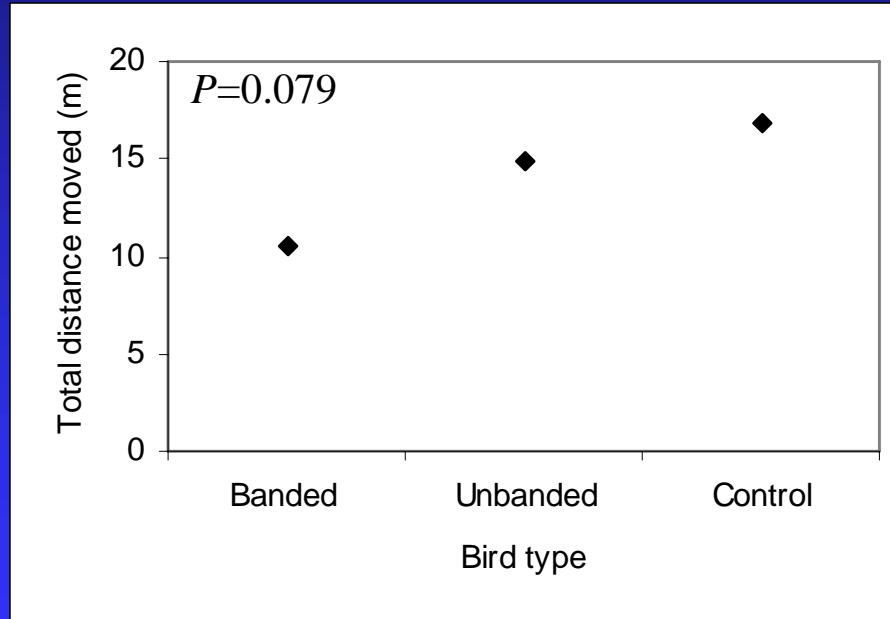
Alert posture



Alert posture

- Observer, week of study period, air temperature, activity prior to disturbance, cover type prior to disturbance, number of chicks, and tameness scale score:
 - ◆ followed no obvious trends
 - ◆ all had $P > 0.10$
- Time of day showed a very slight trend of decreased alertness at mid-day

Total distance moved



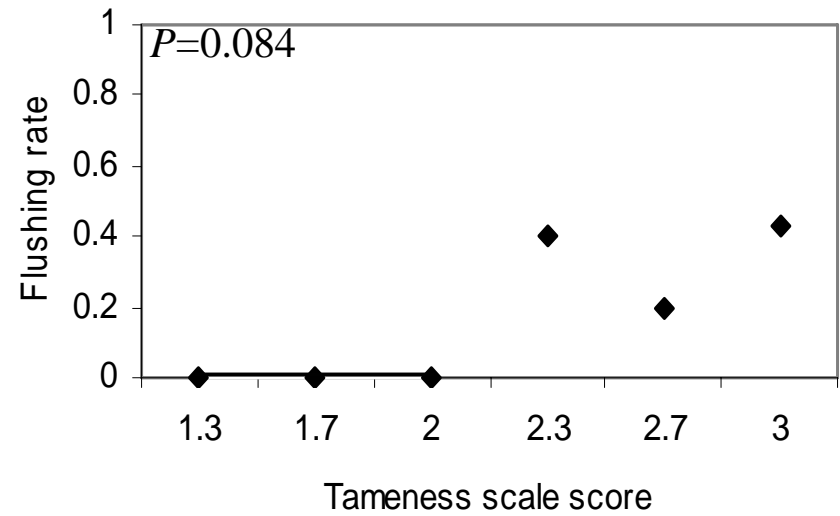
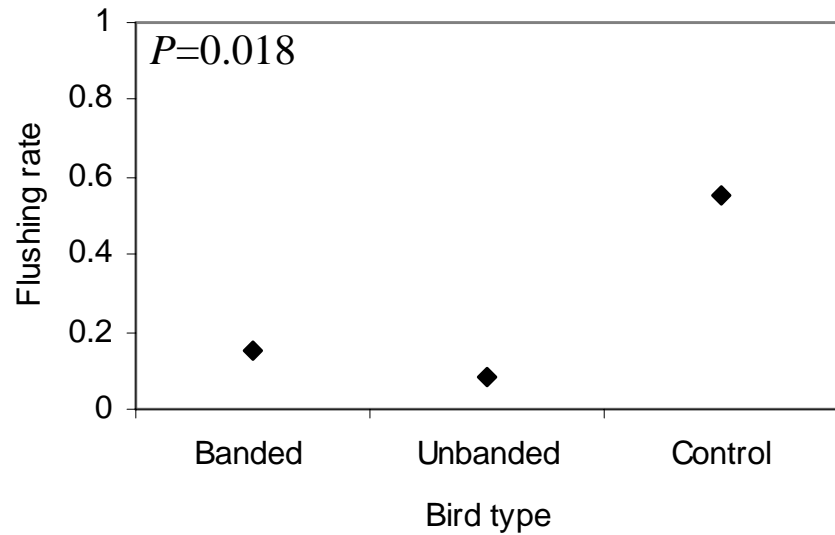
Total distance moved

- Observer, air temperature, activity prior to disturbance, cover type prior to disturbance, number of chicks, and tameness scale score:
 - ◆ followed no obvious trends
 - ◆ all had $P > 0.10$

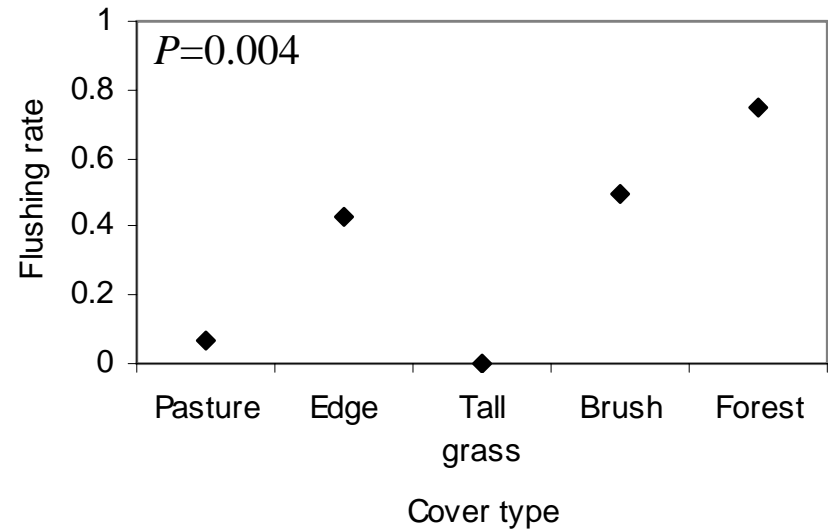
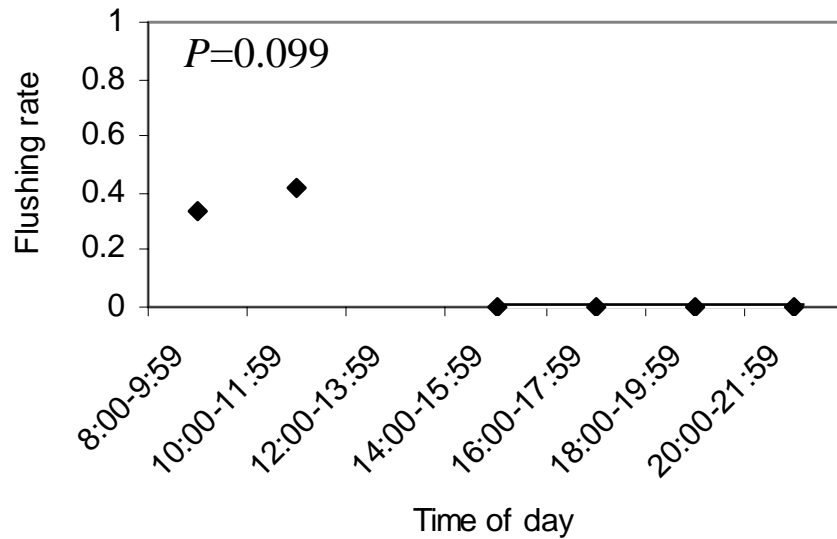
Total distance moved

- Week of study period had $P < 0.10$, but followed no predictable trend
- Slight increase with time of day and age of chicks, but both had $P > 0.10$

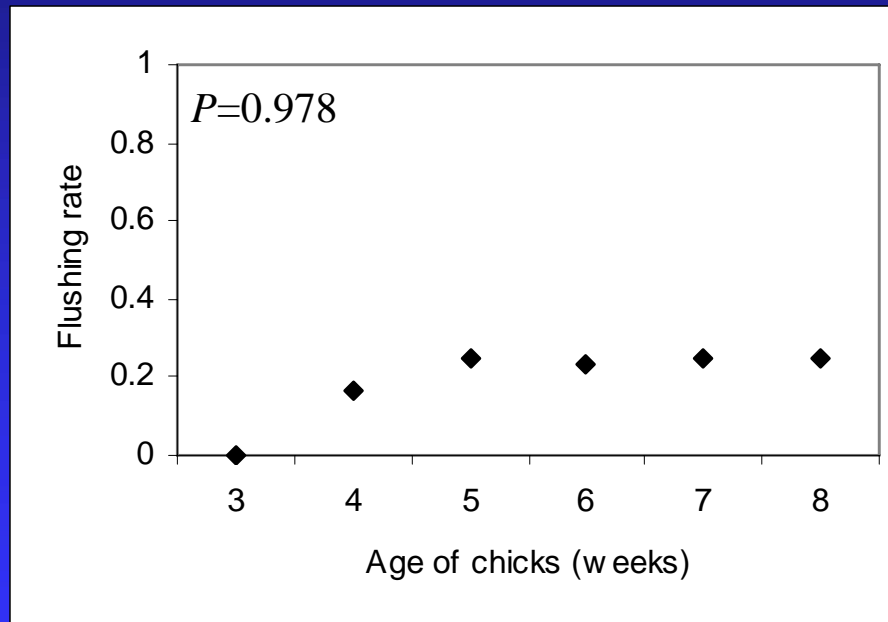
Flushing rate



Flushing rate



Flushing rate



Flushing rate

- Observer, air temperature, and activity prior to disturbance:
 - ◆ followed no obvious trends
 - ◆ all had $P > 0.10$
- Week and number of chicks had $P < 0.10$, but followed no predictable trend

Discussion

- Observer, week of study period, air temperature, number of chicks, and activity prior to disturbance do not seem to affect flushing behavior
- These factors do not need to be considered when assessing flushing counts

Discussion

- Time of day
 - ◆ seemed to affect flushing behavior
 - ◆ less alert at mid-day
 - ◆ moved further from observer later in day
 - ◆ flushed more readily in morning
 - ◆ should be considered when assessing flushing counts

Discussion

- Age of chicks
 - ◆ reaction to human disturbance became more severe with older chicks
 - ◆ hens may react to intrusion differently at different times of the summer depending on the age of their chicks
 - ◆ number of weeks post-hatch should be considered when assessing flushing counts

Discussion

- Cover type prior to disturbance vs. bird type
 - ◆ 29 of 47 tests were conducted in pasture cover type
 - ◆ only 1 of those 29 tests was with a control bird
 - ◆ all tests of birds in tall-grass cover type were with control birds
 - ◆ brush, edge, and forest cover types were randomly distributed among bird types

Discussion

■ Cover type

- ◆ birds flushed more readily if there was sufficient cover to flush towards
- ◆ birds in forested areas tend to flush more readily than birds in open grassland with no nearby brush or forest habitats
- ◆ cover type should be considered when assessing flushing counts

Discussion

- Tameness scale score
 - ◆ indicates tamer birds were less likely to flush
 - ◆ indicates type of bird (level of human contact) has at least an equal affect on flushing behavior
 - ◆ level of human contact should be considered when assessing flushing counts

Management implications

- Many factors seemed to affect hen blue grouse flushing rates
 - ◆ level of habituation to humans
 - ◆ cover type
 - ◆ age of chicks
 - ◆ time of day



Management implications

- These factors should be considered when comparing populations of blue grouse assessed using flushing counts

