

# INSECTS IN SAGE GROUSE DIET



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# WHAT DO WE KNOW?

- Adult Sage Grouse diet includes mostly sage brush (>60%)
- However, during the first weeks of their life, Sage Grouse juveniles feed almost exclusively on insects

# WHAT DO WE KNOW?

How long do they feed on insects?

- Klebenow & Gray (1968): 1 week
- Patterson (1952): 1 to 2 weeks
- Johnson & Boyce (1990): 3 to 6 weeks
- Drutt et al. (1994): up to 10 weeks

Johnson & Boyce (1990):

0-3 weeks: insects are needed for survival and development

3-6 weeks: insects are needed for optimum development

# WHAT DO WE KNOW?

What kind of insects do they feed on?

- Hymenoptera (ants)
- Orthoptera (grasshoppers and crickets)
- Coleoptera (scarab beetles, weevils, darkling beetles, leaf beetles)
- Hemiptera (true bugs)
  
- Earthworms

Sources:

Klebenow & Gray (1968)

Johnson & Boyce (1990)

# ANTS

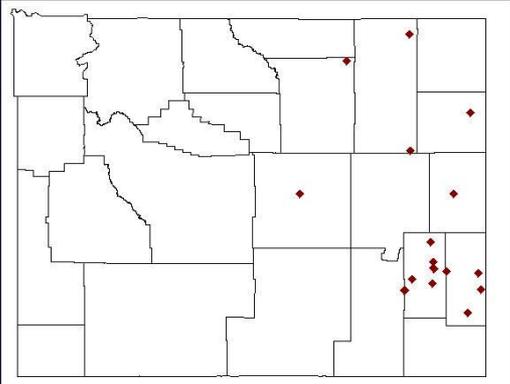
11 species



# GRASSHOPPERS

- Grasshoppers (Orthoptera: Acrididae)
  - >100 species in Wyoming
  - nymphs develop in June
  - several species feed on sage brush

# SAGEBRUSH GRASSHOPPER



*Melanoplus bowditchi*, the sagebrush grasshopper, is known from areas with sagebrush in eastern Wyoming.

It is under-reported on this map because of difficulty in identification.



Eggs overwinter in the soil. Adults are present from July to September.

It feeds exclusively on sagebrush and may prefer sandsage. It is probably not abundant enough to affect sagebrush distribution and abundance.



Source: Pfadt (1991)

# DARKLING BEETLES



# DARKLING BEETLES



# WEEVILS



# SCARAB BEETLES



# LEAF BEETLES



# OTHER SAGEBRUSH ARTHROPODS

## Foliage arthropods (63 spp.)

- Homoptera: 4 families
- Diptera: 6 families
- Hymenoptera: 2 families
- Aranea: 5 families
- Acari: 3 families
- Hemiptera: 2 families
- Thysanoptera: 2 families
- Collembola: 1 family
- Psocoptera: 1 family

# OTHER SAGEBRUSH ARTHROPODS

Soil/Litter arthropods (146 spp.)

- Collembola: 4 families
- Psocoptera: 3 families
- Thysanura: 2 families
- Homoptera: 3 families
- Diptera: 8 families
- Coleoptera: 6 families
- Hymenoptera: 2 families
- Aranea: 4 families
- Acari: 6 families
- Hemiptera: 1 family
- Thysanoptera: 2 families

Source: Christiansen (1988)

# OTHER SAGEBRUSH INSECTS



## Hera sheep moth (Lepidoptera)

- Caterpillars feed on sagebrush
- Complex biology: may diapause for up to 6 years and then emerge *en masse* under suitable conditions

# OTHER SAGEBRUSH INSECTS

Mormon cricket (a katydid)



# HOW DO THE SAGEBRUSH INSECTS RESPOND TO HABITAT DISTURBANCES?

Prescribed fire:

darkling and scarab beetles were not affected

Pyle & Crawford (1996)

Mowing:

decreased density of most orders  
increased diversity of most orders except  
Coleoptera and Hymenoptera

Christiansen (1988)

# WHAT CAN WE DO?

- Compare arthropod communities (richness, evenness, diversity) in undisturbed and disturbed sagebrush habitats
- Choose several species of arthropods as sagebrush (and Sage Grouse) habitat indicators
- Monitor the disturbed Sage Grouse habitat quality using the selected arthropod bioindicator species

# COLLECTION METHODS

Foliage arthropods:

- sweep-net samples
- Malaise traps

Ground-dwelling arthropods:

- pitfall traps

# ARTHROPOD ID

- Identify sagebrush arthropods to family (and in some cases to species) level

## Wyoming Arthropod Diagnostic Clinic:

Alex Latchininsky (766-2298, [latchini@uwyo.edu](mailto:latchini@uwyo.edu)) and  
Scott Schell (766-2508, [sschell@uwyo.edu](mailto:sschell@uwyo.edu))

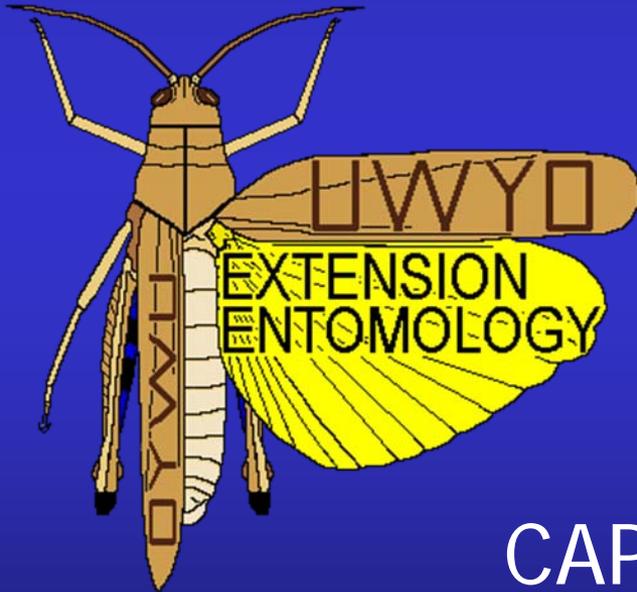
## Rocky Mountain Insect Museum:

Scott Shaw (766-5338, [braconid@uwyo.edu](mailto:braconid@uwyo.edu))

# Web Resources for Entomology at UW

## Extension Entomology Website

<http://uwadmnweb.uwyo.edu/UWCES/Entomology.asp>



- Insect in the Home
  - Insect in the Garden
  - Spiders
  - Hot topics
  - Publications and Bulletins
  - Insect Identification
- ...and much more

## CAPS Website

<http://uwadmnweb.uwyo.edu/CapsWeb/>

Weed and Pest Alerts