Pollinator Insects Play an Important Role in Sustaining Diversified Habitats and…

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They Aren’t All Honey Bees and Butterflies

Longhorned beetle

Narcissus flies

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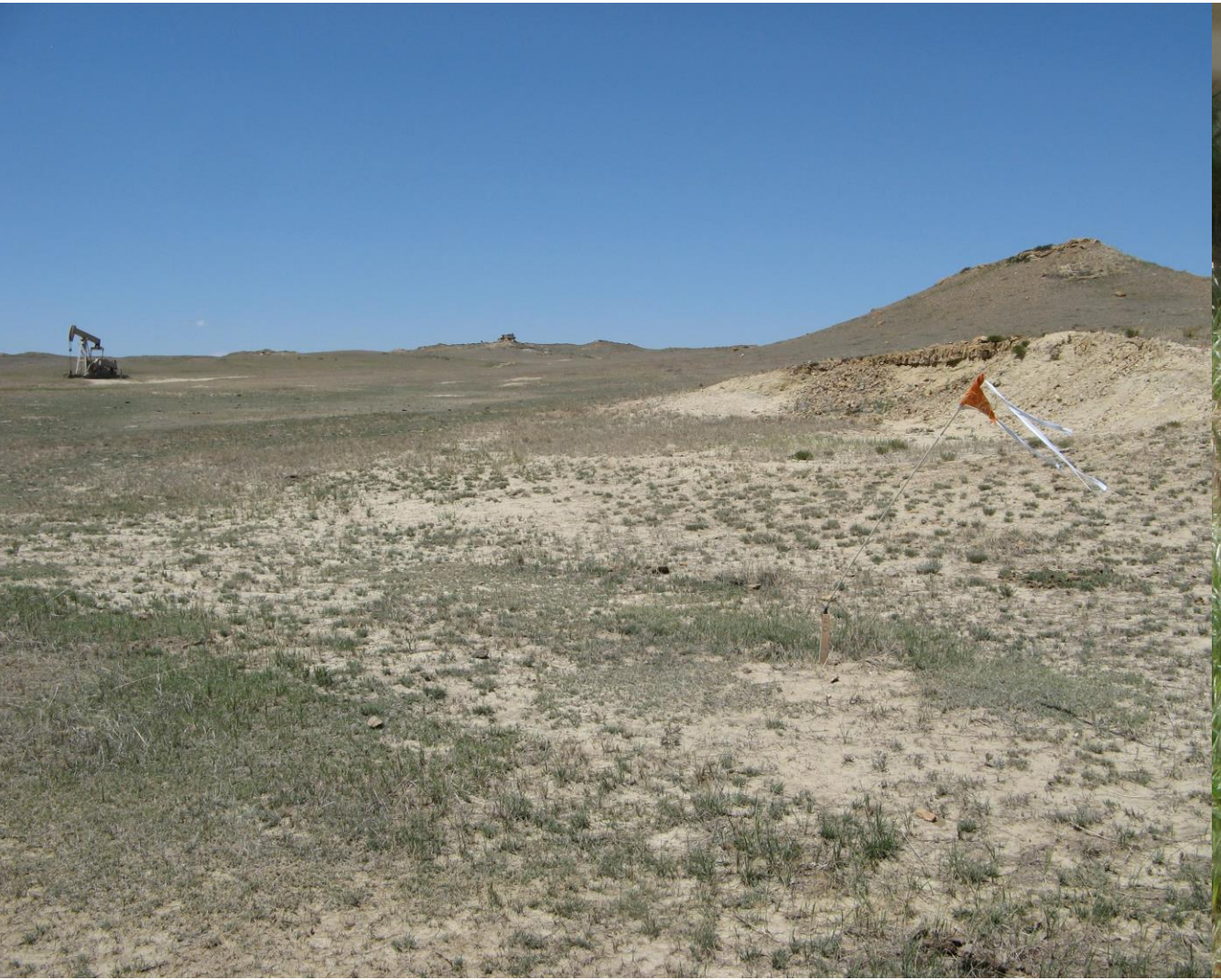
What the BLM states reclamation should be:

"The ultimate objective of reclamation is ecosystem restoration, including restoration of any natural vegetation, hydrology, and wildlife habitats affected by surface disturbances from construction and operating activities at an oil and gas site."

It would be a lot simpler task if you could just irrigate and plant a wildlife magnet crop like alfalfa!

Instead you have to restore habitats like this while keeping invasive weeds like cheatgrass at bay.



In addition, reclamation has to last Long-term

"The BLM continues to monitor the site over the long term to ensure that stability and full ecosystem restoration. Reclamation is successful when it has established a self-sustaining, vigorous, diverse, native plant community that will control erosion and non-native plant invasion and support wildlife habitat or forage production."

No toadflax or leafy spurge here yet, these are western wallflowers after two "wet" years.

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Pollinator insects help with long-term reclamation success of large disturbed areas in two ways:

1. Ensure flowering forbs, used in reclamation seed mixes, are successfully pollinated and set seed to perpetuate themselves.

2. Provide the critical resources of nectar and pollen to insects whose larvae are important predators of plant feeding pests of revegetated such as plant bugs, grasshoppers and cutworms.

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POLLINATION AND FERTILIZATION

Very Simplified

Pollen from another plant carried by insect ends up on stigma

3

4

2

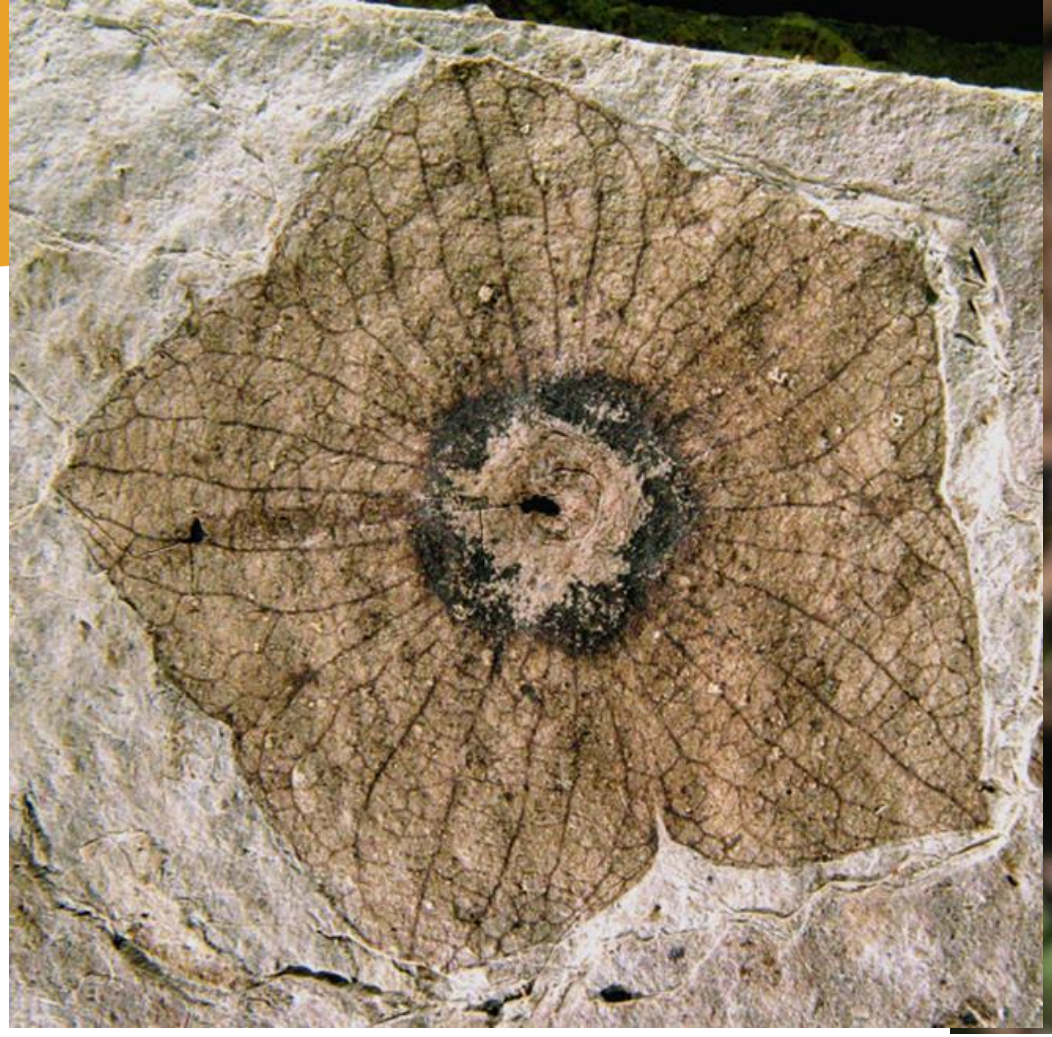
Germination – germ tube grows down the style to the ovary

5

1

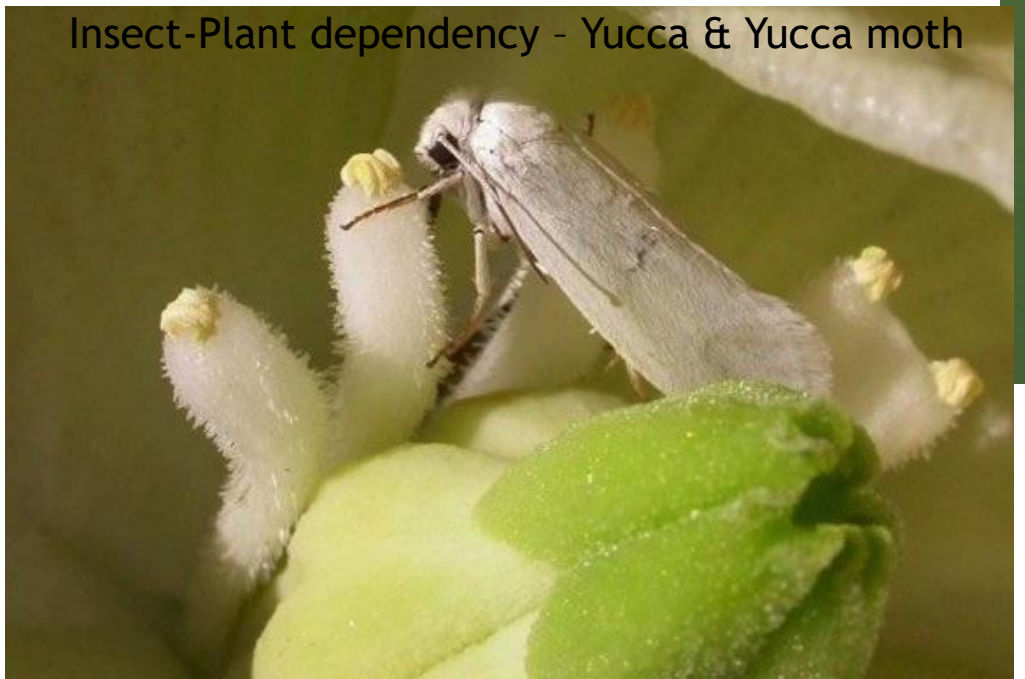
Pollen produced by anther

Flowers that use animals are arranged so they get dusted by pollen when they visit

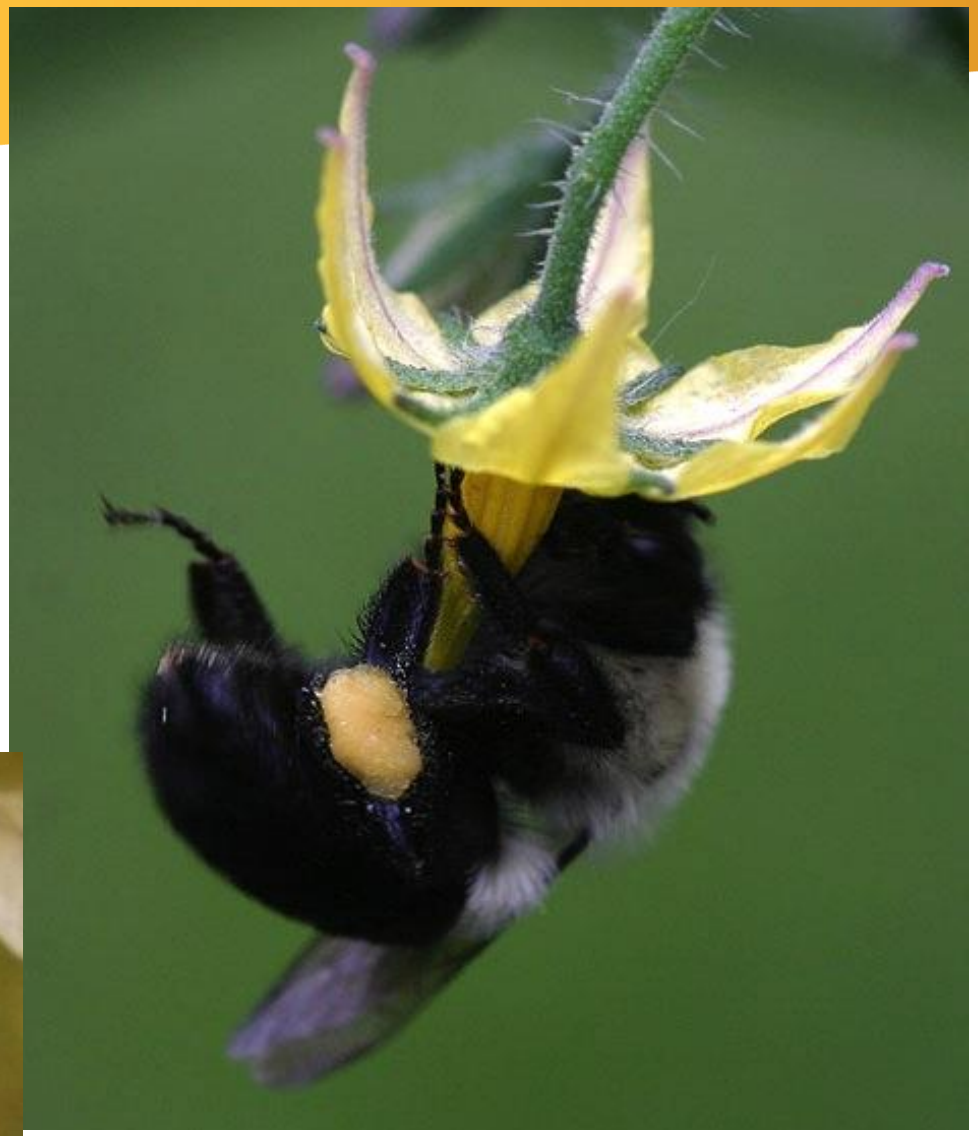


Fossil evidence of flowering plants (angiosperms) shows them diversifying and flourishing starting in early Cretaceous period.

Specialized structures for pollination - the proboscis



Insect-Plant dependency – Yucca & Yucca moth



Specialized behavior- buzz pollination

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INSECT ORDERS:

Major groups of insects sharing common traits

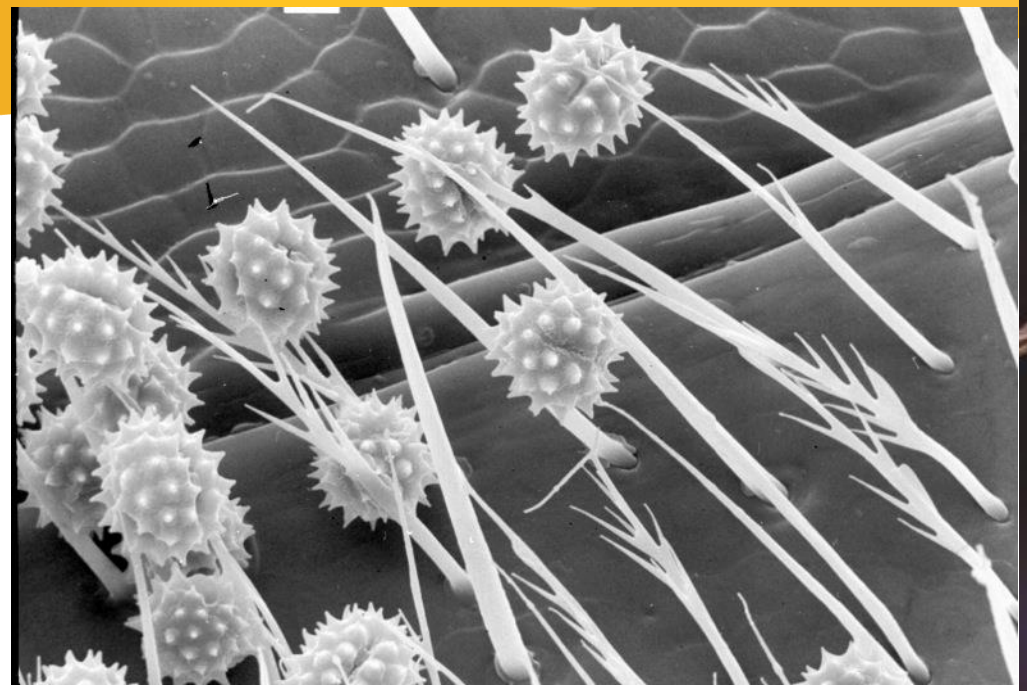
Families – even closer relations – end with "-idae"

Example - Coccinellidae

Order Coleoptera (Beetles)
Hard shell like front wings

Order Diptera (True flies)
Only one pair of wings

Superfamily Apoidea of the Order Hymenoptera ~3,500 species in NA



Honey bees (Apidae) are considered the most efficient pollinators. Branched "hair" and a static electricity charge that attracts pollen plus their behaviors are key to this efficiency.

Subfamily Apinae - bumble bees – the genus *Bombus*

Wild native bees like this *Bombus huntii* are necessary for early season native flowers

sps

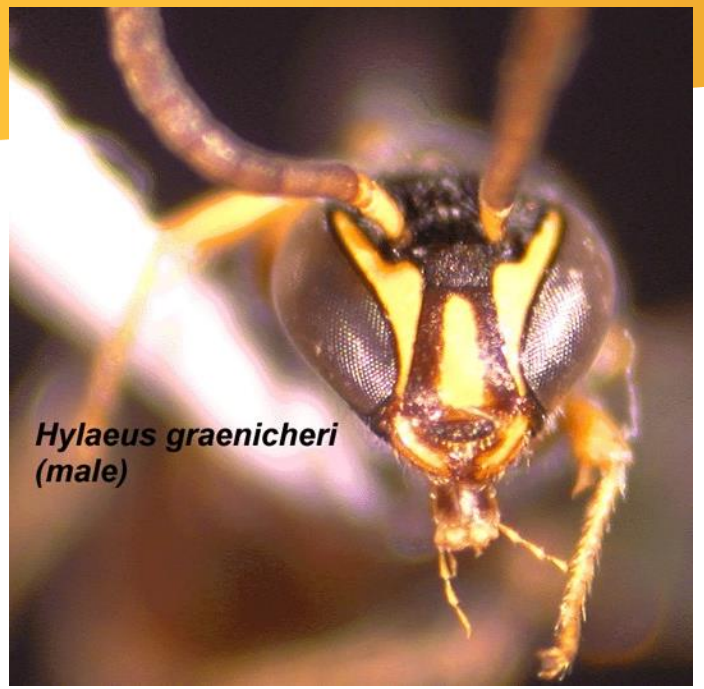
Other Common Bee-like Families In the Superfamily Apoidea

Adrenidae – “mining bees”
A species, *Anthophora pueblo*, described in 1980 from in Utah chews holes in soft sandstone for their nests.

Abundant subfamily Anthophorinae common called “digger bees”

Solitary, but some species will group up in suitable habitat but they are independent of each other. Most nest in the soil.

Colletidae -Yellow face and plasterer bees



The vast majority of bee species found in Wyoming nest in holes in the earth.

Halictidae - alkali bees and sweat bees

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Megachilidae -
Leaf-cutter bees

Also includes the orchard
& mason bees

Many of them use hollow stems
and holes in wood for their nests.

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Many other Families in Hymenoptera feed on nectar and some pollinate.

Hunting wasps (Sphecidae – L & Crabonidae –R) capture plant feeding insects for their larvae but feed on flowers as adults

Hymenoptera

Includes 1000's of beneficial "non-stinging" wasps that help control plant feeding insect populations. Such as this member of the huge superfamily Ichneumonoidea attacking the aphid. Its larvae completes development inside the unlucky host.

Many of these parasitoid wasps will use flower nectar for adult stage sustenance but some will feed on guttation fluids, aphid and softscale insect honeydew, and some will also feed on other insect's hemolymph after stabbing them with their ovipositor.

The Order Diptera (True flies) contains many pollinators.

Tachinidae family flies are entirely beneficial. The adults feed on nectar and pollinate flowers. Their larvae eat other insects, such as grasshoppers and caterpillars, from the inside out.

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Many flies mimic wasp coloration for defense

A typical flower fly, Family Syrphidae, its larvae preys on aphids.


A bee fly (Bombiliidae) - The larvae are predators of other insect's eggs. This species uses grasshopper egg pods.
Sparnopolius species bee flies
Larvae feed on June beetle grubs
©AVL2007

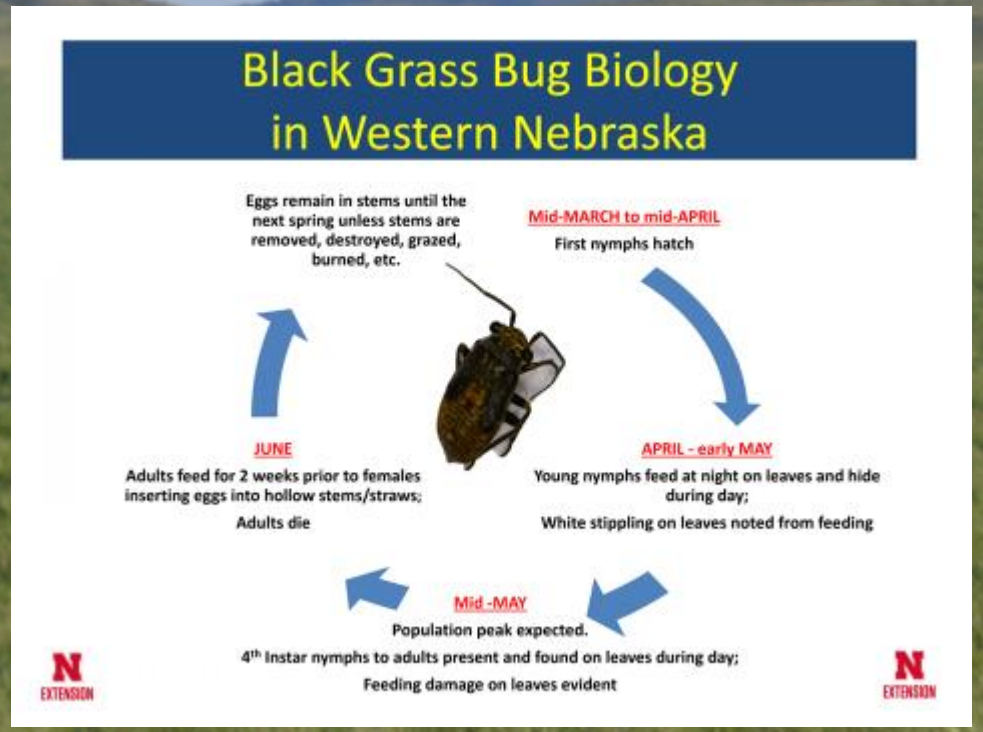
Coleoptera - The beetles are considered “mess and soil” pollinators because they have chewing mandibles.

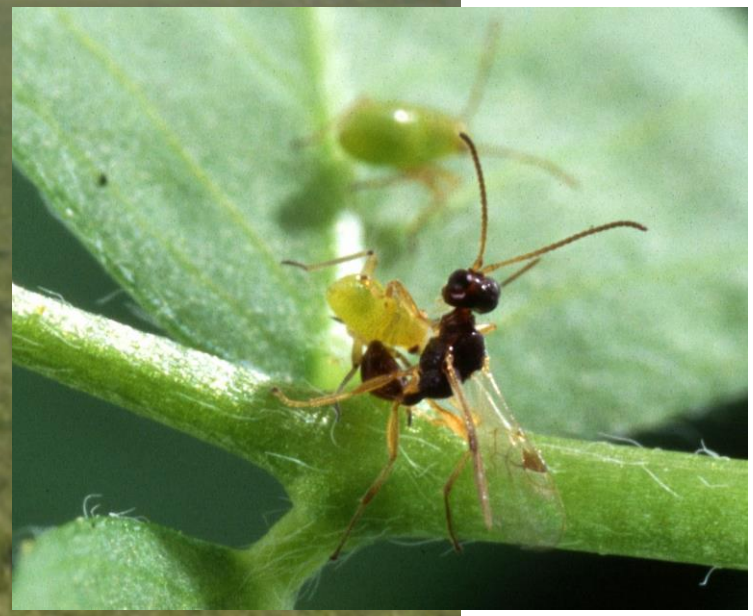
A Cerambycidae subfamily, the Lepturinae, aka flower longhorn beetles, are pollinators.

The checkered beetle family Cleridae contains some species that feed on pollen.

Example of crested wheatgrass monoculture that would benefit from flowering plants and the predator and parasitoid insects that depend on them.

This wheatgrass pasture should be taller, greener, and sprouting seed heads.





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Questions about insect pollinators?

"Promoting Pollinators on Your Place"

Publication #: B-1305

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www.wyoextension.org/agpubs/pubs/B-1305-web.pdf

For arthropod identification service contact: insectid@uwyo.edu

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