PROTECTION OF POLLINATORS FROM INSECTICIDE, FUNGICIDE & HERBICIDE APPLICATIONS

Produced by the Confederated Salish & Kootenai Tribes

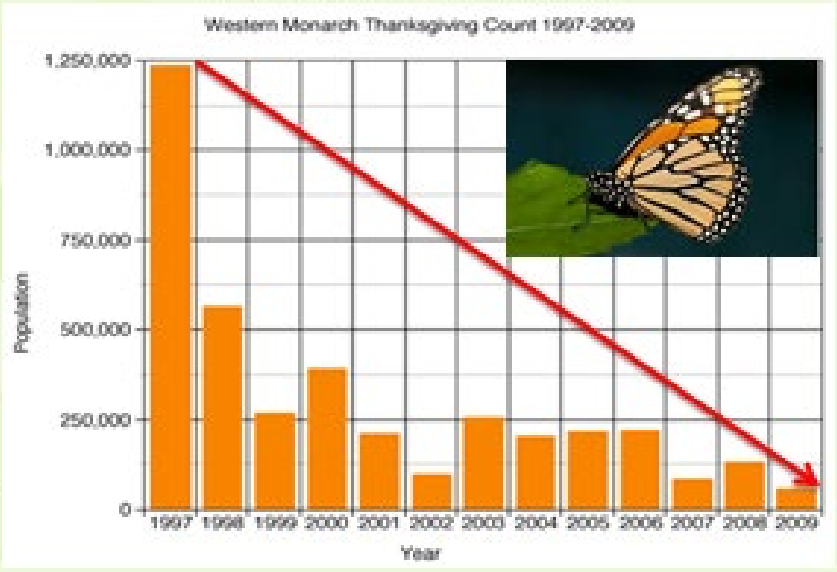
Natural Resource Department

POLLINATOR DECLINE

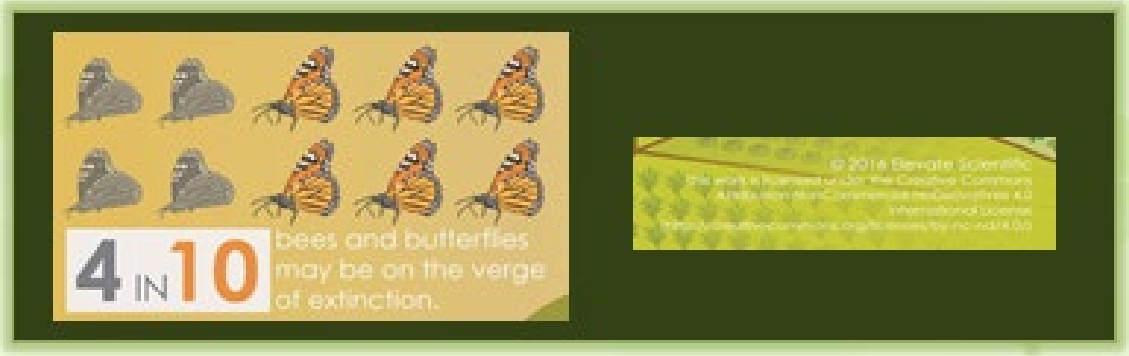
There are many factors causing the decline of pollinators.

- **Pesticides –** kill bees or affect their ability to forage plants, shown to also sometimes effect their ability to find their way back to nesting areas
- **Habitat loss** –including urbanization (increasing in habitat normally used by pollinators being turned into pavement or housing) and deforestation (loss of forest habitats)
- **Pathogens & parasites** – including varroa mites, the treatments for which also can negatively impact bees
- **Climate change** – in part resulting changes to bloom times, putting pollinators out of sync with their natural resource

For example, Monarch butterflies are experiencing alarmingly rapid population decline. Many of the factors listed above have a role in their decline, but also the extermination of showy milkweed. Monarchs solely rely on milkweed for habitat and food. Adults lay eggs on the leaves of milkweed which the larvae then feed off of. Without it, we will no longer have Monarch butterflies.



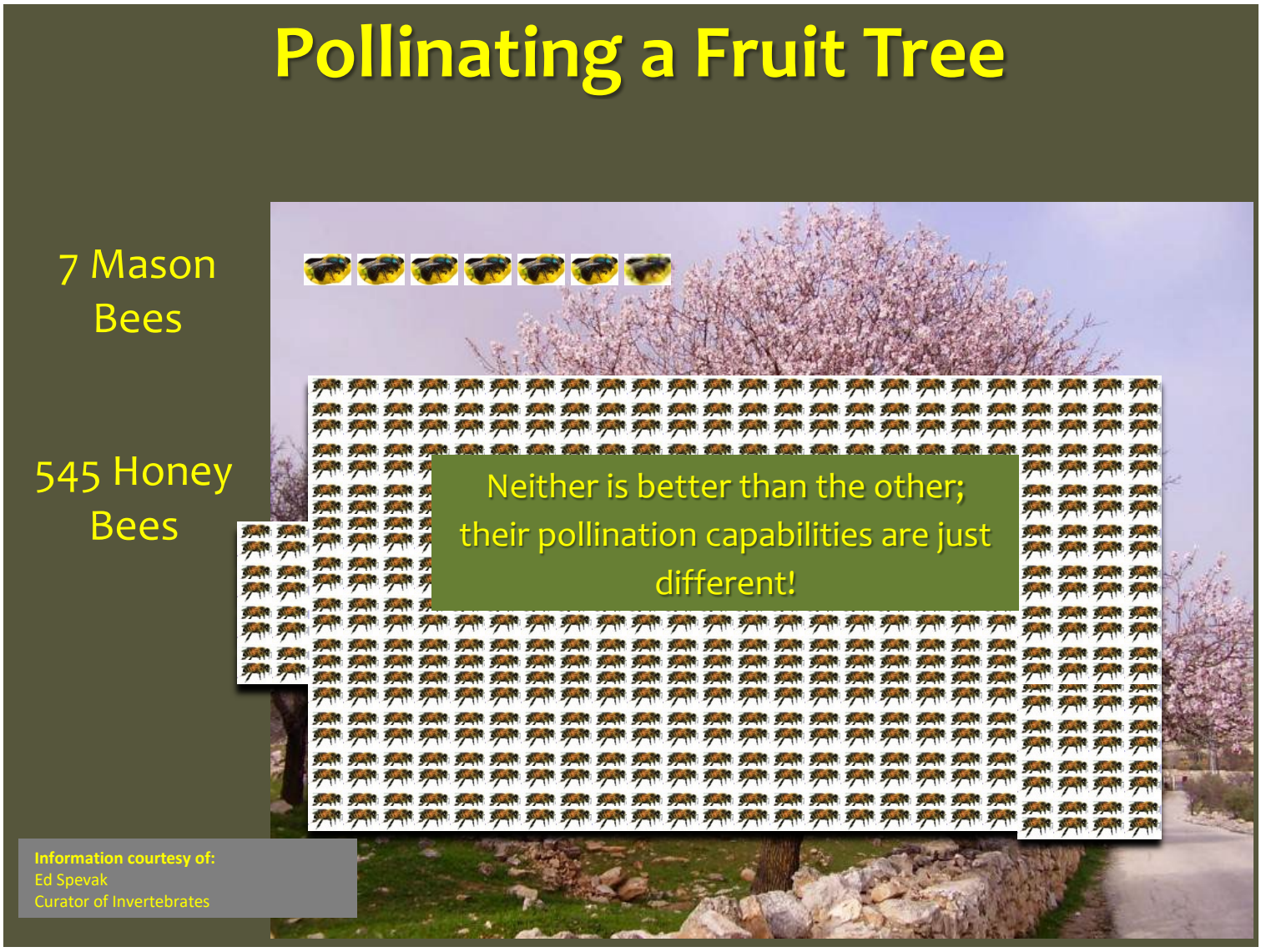
The Monarch Butterfly is on the verge of extinction. Since the 1980s, there has been a 95% decrease in the species (Schultz et al. 2017).



EFFICIENCY - NATIVE BEES VS. HONEY BEES

Honey bees are great pollinators and are easily maintained. However, native bees such as mason bees are much more efficient when it comes to pollinating.

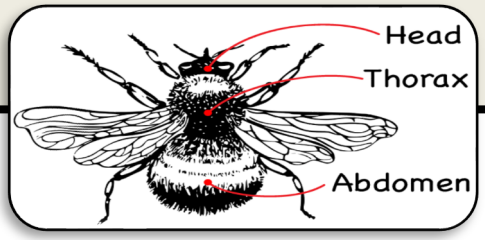
In a mature acre of almonds there are roughly 110 trees. Honey bee hives usually have about 120,000 bees with half of them pollinating, or 545 per tree. Mason bees however are solitary bees, meaning they do not live in hives, and they pollinate at all times of the day. About 800 of them are needed per acre, or seven per tree. When compared to the honey bees, it is clear that using only those seven mason bees per tree versus 545 honey bees, you are getting much more pollination done with fewer resources.



Native Montana Bee Identification

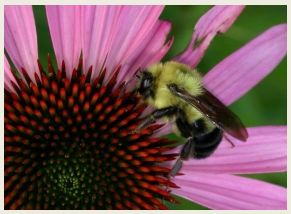
Bee Identification

Bees are similar to other insects meaning they have three body segments: **head**, **thorax**, and **abdomen**. The **head** consists of the eyes, antennae that are bent, and mouth parts that include jaws for chewing and a tongue for drinking nectar. The **thorax** bears their legs and wings (two hind-wings & two forewings). The **abdomen** contains the stinger (on females) and hind legs (pollen-carrying).



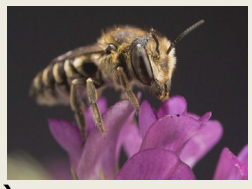
Importance

Bees play a major role in natural and agricultural systems. They pollinate flowering plants that provide food, fiber, animal forage, and ecological services like soil and water conservation. About three-quarters of all flowering plants rely on pollinators to reproduce. On top of what honey bees do, native bees provide valuable pollination services. It's unknown, but the number of native bee species in Montana is likely in the hundreds. Here are nine of those different species with characteristics, size, and common native plants they pollinate.

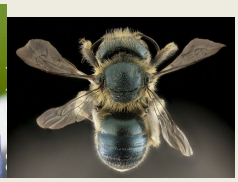
Bumble bees (*Bombus spp.*)

- Robust, hairy bees; black body covered with black, yellow, orange, or white hair bands; pollen basket on hind legs; 10-23 mm in size.
- Social colonies; usually nest underground in small cavities like old rodent burrows.
- Can buzz-pollinate. This is important for plants like tomatoes, blueberries, peppers, and cranberries to name a few.

Leafcutting bees (*Megachile spp.*)

- Head is as broad as the thorax; large jaws used to cut leaves; black body with pale hair bands on abdomen; pollen-carrying hairs on underside of abdomen; 7-15mm in size.
- Solitary bees; nest in natural or man-made holes such as beetle tunnels or wood nesting blocks.
- Females cut circular pieces from leaves to use as lining for nests.
- Pollinate fruits, veggies; used by commercial growers to pollinate blueberries, onions, carrots and alfalfa.

Mason bees (*Osmia spp.*)

- Robust body; broad, round head and abdomen; usually metallic green or blue; pollen carrying-hairs on underside of abdomen; 5-20mm in size.
- Solitary; nest in natural or man-made holes like beetle tunnels, wood nesting blocks, or reed stems
- Use mud or chewed-up leaves/petals for nest walls.
- Generally like fruit trees and a wide variety of flowers.


Small Carpenter bees (*Ceratina spp.*)

- Shiny, dark metallic blue-green body; sparsely haired, distinctive cylindrical abdomen' pollen-carrying hairs on hind legs; 3-10mm in size.
- Solitary; nest in dead twigs and stems.
- Yellow or white marking on face (males have inverted T).


Sweat bees (Family: Halictidae)

- Many different forms including: dull black/brown body with light abdominal hair bands, bright metallic green, dull metallic blue, copper, or green, and black with a red abdomen (parasites of other bees); pollen-carrying hairs on hind legs except in parasitic bees; 3-11mm in size.
- Solitary, communal, and semi-social soil nesters; some attracted to salt in human sweat.
- Visit a wide variety of flowers.


Yellow-faced or masked bees (*Hylaeus spp.*)

- Slender; almost hairless; black body with yellow or white marking on head, thorax, and legs; no pollen-carrying hairs; 5-7mm in size.
- Solitary; nest in twigs, stems, and existing tunnels in wood.
- Carry pollen and nectar in special storage structure of digestive system called a crop.
- Pollinate wide variety of wild flowers.


Cuckoo bees (*Normada spp.*)

- Wasp-like; sparse branched hairs; red or black body with yellow or white marking; relatively think antennae; no pollen-carrying hairs; 5-15mm in size.
- Females visit flowers for nectar but do not collect pollen for their young.
- Females are cleptoparasites, meaning they lay eggs in nests of other bees, stealing the nests and food.


Long horned bee (*Melissodes spp.*)

- Robust; hairy; black body with pale hair bands on abdomen; dense pollen-carrying hairs on hind legs; very long antennae; 7-16mm in size.
- Solitary to communal ground nesters.
- Some very attracted to asters, sunflowers, and daisies.


Mining bees (*Adrena spp.*)

- Black or dull metallic blue or green body; fairly hairy, pollen-carrying hairs on upper parts of hind legs (like "armpits") ; 6-15mm in size.
- Solitary; nest in the ground; prefer sandy soil.
- Very abundant in the spring because they are one of the first bees to emerge each season.
- Pollinate a wide variety of plants.

INTRODUCTION

The Confederated Salish & Kootenai Tribes of the Flathead Reservation recognize the importance and benefits of pollinators in not only the state of Montana, but all over the world. The Tribe recognizes that using herbicides, insecticides, and fungicides to manage pests and diseases for crop production is important. Reducing the risks of agricultural practices that have negative effects on pollinators is highly encouraged.

The main goal of the protection plan focus on the interaction between crop protection chemicals, wildlife & habitat restoration programs and pollinator conservation programs. Evidence shows that the management practices listed within the plan will benefit native pollinators. Because of the difficulty in evaluating native pollinator populations and financial considerations, the plane will mainly focus on managing pollinators and agricultural chemicals such as herbicides, insecticides and fungicides.

In the plan are best management practices and suggestions that encourage and facilitate communication between beekeepers, agricultural crop producers, and the public. Beekeepers and agricultural crop producers are two groups that can find it challenging to come to a consensus when dealing with the use of crop-protection chemicals and land use issues.

Pollinators can only tolerate a certain amount of biological and environmental stress. The most productive areas in which pollinator protection efforts can focus on are keeping pesticides away from bees, and bees away from pesticides. Native pollinators visit and pollinate crops, so efforts to minimize pesticide impacts on managed pollinators will also benefit native bees and other beneficial insects.

The plan is intended to be a work in progress, which will continue to be updated over time. Knowledge and research will continue to expand thus allowing for future improvements protecting pollinator health. The Tribes recognize that pollinators thrive on native plant species. Understanding and gaining knowledge of those species will increase the efforts and productivity of pollinator conservation.

Native pollinators have similar requirements to honey bees when it comes to forage and specific habitat requirements. The purpose of this plan is not only to increase numbers for managed pollinator populations, but for native pollinators as well. The Tribes recognize that protecting and conserving native pollinators is challenging due to small, dispersed populations of non-social pollinators often requiring distinct habitats. Improvements, such as increased forage and minimized pesticide impacts, benefit these vital species as well, and may be the most effective way to protect and encourage their populations.

PROTECTION OF NATIVE BEES FROM HOMEOWNER PESTICIDE APPLICATORS

Eliminate or reduce the use of systemic pesticides whenever possible. In particular, systemic insecticides including neonicotinoids should be avoided. These can cause harm to more than just the targets listed on the label and persist in the environment much longer. An example would be seed treatments.

- Persistence – the amount of time a pesticide stays in the environment after an application

  Example: If you were to spray Bayer Advanced Home Pest Insect Killer in January, only half of the application would break down by February. In March of the same year, a quarter of the application would remain. Even by April, that one application would still have an eighth remaining. In the span of three months, the one application of Bayer Insect Killer persists in the environment. When you consider how often and regularly agricultural land owners apply pesticides, it's very clear that those applications never break down, thus remaining there for pollinators to come into contact with.

  - 30 days → half of application will break down
  - 60 days → ¼ more of application will break down
  - 90 days → 1/8 of application still left where applied

  (This is a generalized example, all pesticides are different and their persistence time varies)

Using areas of clean ground for nesting such as around a crop field is beneficial for pollinators. These areas can be planted with native plants or even have "Bee hotels" (see images below). Providing clean water in some way is also beneficial.

When planting native plants it is important to have a variety of species. Plant diversity is not only pleasing to the eye but can also provide a wider range of bloom times. Plants blooming throughout the year provide a constant food source for pollinators. Not only do they have more opportunities for foraging, but the added variety is attractive to more types of pollinators, and the beneficial insects as well.

Some great examples of native plant species:

Name	Bloom Time	Picture
Prairie Coneflower (*Ratibia columnifera)*	Perennial; June-September	
Prairie Aster (*Machaeranthera tanacetifolia)*	Biennial; Mid-Summer to First Frost	
Indian Blanket Flower *(Gaillardia pulchella)*	Perennial; July-September	
Western Yarrow *(Achillea millefolium)*	Perennial; July-September	

PROTECTION OF HONEY BEES FROM PESTICIDE APPLICATIONS

The Confederated Salish & Kootenai Tribes recognize that the pollination, honey, and wax production provided by commercial honeybees; the pollination of native bees and the positive impacts of beneficial insects; plays a major role in agriculture and the environment. We also recognize the benefits of using pesticides to control or reduce pests that adversely affect crop production. Loss of honeybees and native bees due to pesticide applications result in a reduction of honey and crop production. This decline may also result if applications of pesticides delay or are prohibited.

Consideration, communication, common sense, and cooperation are the keys for minimizing pesticide damage to commercial and native bees.

The department has established the following guidelines/best practices, in cooperation with the agriculture industry, to assist in minimizing damage to pollinators while recognizing the need to protect producers' crops from pests. These guidelines are non-mandatory and are not intended to replace or preempt any applicable rules, statutes, or pesticide label requirements.

PESTICIDE APPLICATORS, GENERAL PUBLIC & LAND OWNERS

Observe ALL pesticide label directions:

- For assistance in determining the best management practices to use in your situation, contact your local extension agent, Natural Resource Department – Pesticide Program, Montana State University specialist, crop consultant, or chemical company representative.

Know your service area:

- Locate any apiary sites within the areas being treated by using the Montana Department of Agriculture website → arg.mt.gov
- Periodically contact bee keepers in your area to familiarize yourself with their operations. Obtain name, address, telephone number(s), and a map of the apiary site. Know where the apiary area is in correlation to the treatment area.

- Examine treatment area prior to any chemical application to determine if commercial or native bees are using the area and evaluate the life stages of plants (blooming crops/weeds).
- When economically feasible use pesticides or insecticides less harmful or potentially non-harmful to bees. Apply at appropriate times of the day to avoid foraging bees.
  - Avoid applying when temperatures are low or have high humidity, including weather after the application. Toxic residues can remain hazardous to bees much longer during these periods (persistence, inversions).

Check the Natural Resource Information System (NRIS) website:

- http://maps2.nris.mt.gov/mapper/county.html → can check apiary sites in your area; shows commercial sites in the area only (landowner and hobbyist apiaries are NOT shown)
- Search "Agriculture" in the search box. Scroll down to rank 35 "Montana Registered Commercial Apiaries" and select. There will be a button labeled "View" which will open up a map with the apiaries on it.

Communication:

- The key to success is communication. ALWAYS contact bee keepers or land owners at least 48 hours prior to applications. This allows time to remove the bees and protect them.
- Inform the bee keeper or landowner which insecticides or pesticides will be used and provide a copy of the label if possible.
- If possible, provide exact location and approximate time of application.

BEEKEEPERS

- Mark apiaries legibly with name, address phone number, and if possible, landowner's name. This info should be legible from a safe distance.
- Notify lessees and landowners of the presence and location of ALL apiaries, and date hives placed on the land or lease. Provide owners with name and phone number.

- If possible, choose sites that are relatively isolated from potential insecticide and pesticide applications.
- Contact producers in the area of the apiary site; give them same information given to land or lease owner, along with this guide.
- Inform self about local insect pest problems and how they are being controlled. Become familiar with the various pesticides used on crops around your bees and the potential effects they may have.
- Once application has been applied to area, allow 48 hours to pass before returning hives to that site, unless an increased or decreased time period has been agreed upon.

Recognize that applicators are concerned with the label laws governing the use of pesticides, as well as personal safety. This may influence when they spray and what they prefer to apply.

PRODUCERS

Producers include those on whose land the apiary is located and those in the vicinity of the apiary.

- Know the beekeepers using your land and the property surrounding the area.
- Producer should examine the field to determine the insects present & the types of plants blooming (crops and weeds).
- Request that applicators apply insecticides in a manner that minimizes impacts on bees.
- Learn which pesticides affect bees. For assistance determining best materials to use in your situation, contact your local Natural Resource Department – Pesticides Program (CSKT), extension agent, crop consultant, or chemical company representative.
- Contact beekeeper if an apiary is located within a close distance to crop that is going to be treated with any type of pesticide. Thought to consider, bees typically fly about 2.5 miles from the hive, but are been known to travel as far as seven miles, particularly if resources are scarce.

RESOURCES

Additional information can be obtained from any of the listed resources:

- **Montana Department of Agriculture →**
  agr.mt.gov website or by phone at (406)444-3144

- **CSKT Natural Resource Department – Pesticide Program →**
  Brittani Clairmont
  Pesticide Outreach Coordinator
  Phone: (406)883-2888 ext. 7209

  OR

  Jasmine Brown
  Pesticide Specialist
  Phone: (406)883-2888 ext. 7218

- **Natural Resource Conservation Service (NRCS) →**
  Nrcs.usda.gov
  &
  Lake County Conservation District
  https://lakecountyconservationdistrict.org/
  64352 Hwy 93
  Ronan, MT 59864
  (406)676-2841

- **Xerces Society: Pollinator Conservation →**
  http://xerces.org/pollinator-conservation/gardens/

- **Xerces Society: Reducing Impacts of Pesticides →**
  http://xerces.org/pollinator-conservation/agruculture/managing-pesticides-to-protect-bees/