



Monarch Joint Venture Grant Reprint 2018

Magnificent Monarch



Inside:
Flowers: Butterfly Beacons
Tagging & Tracking Monarchs



Photo by Beth Waterbury

Let's talk about...

The Monarch Butterfly

The monarch butterfly is beautiful and amazing. It is so special that it became Idaho's state insect in 1992.

One thing that makes the monarch so incredible is that it migrates! Idaho's monarch butterflies fly to western California and possibly Mexico to overwinter. They feed on the nectar of flowers until winter comes. Then they enter a state like hibernation. Hundreds of thousands of butterflies cluster together on trees to stay warm. When spring arrives, the monarchs start their trip north.

These butterflies do not reach Idaho. They will die along the way, but they lay eggs that will hatch into a new generation to continue the trip. After two or three generations, monarch butterflies arrive back in Idaho.

Another thing that makes monarchs special is they can eat a plant called milkweed. Milkweed contains toxins.

Not very many animals can eat this plant, but monarch caterpillars love to eat milkweed. As they eat milkweed, the toxins build up in their bodies. The bright colors of the black, white and yellow striped caterpillar and the orange and black adult serve to warn predators that they carry toxins and taste terrible. If a bird or other predator tries to eat the monarch, it will get a big surprise. Smart predators learn not to eat an insect that tastes awful. This will not help the monarch that was the bird's lunch, but it will help other monarchs from becoming a meal.

Like all butterflies, monarchs change throughout their lives. An adult female lays about 400 eggs on the leaves and flower buds of milkweed plants. They don't lay all the eggs on one plant.

They like to lay only one egg on a plant. If she can't find enough milkweed plants to lay one egg per plant, she may lay more than one egg per plant or may lay fewer than 400 eggs. The eggs are tiny; they are about the same size as the head of a pin. Depending on the weather, the eggs hatch in 3-5 days.

The tiny monarch caterpillar will eat its egg case as its first meal. Then it will switch to milkweed and grow quickly. During their two weeks as a caterpillar, the monarchs get 2,000 times bigger and shed their skin five times.

Then it is time for a big change. The caterpillar finds a safe place in vegetation to make a chrysalis. The caterpillar's salivary glands are adapted to make silk. It spins a small pillow on the back of a branch where it hangs from its abdomen. The caterpillar sheds its skin one last time. It then dissolves its tissues into a green

caterpillar soup inside a clear casing. Within an hour, the chrysalis looks like a jade-green jewel with gold and black spots.

After two weeks in the chrysalis, the adult monarch breaks free. It pumps fluid into the veins in its wings. This helps the wings unfold and become stiff. The monarch is now ready to fly and drink nectar from flowers.

Monarch butterflies are truly remarkable. They make an amazing change from caterpillar to adults like other butterflies; they also make an incredible journey that takes them all the way across the country. Monarch butterflies have earned the honor of being Idaho's state insect!

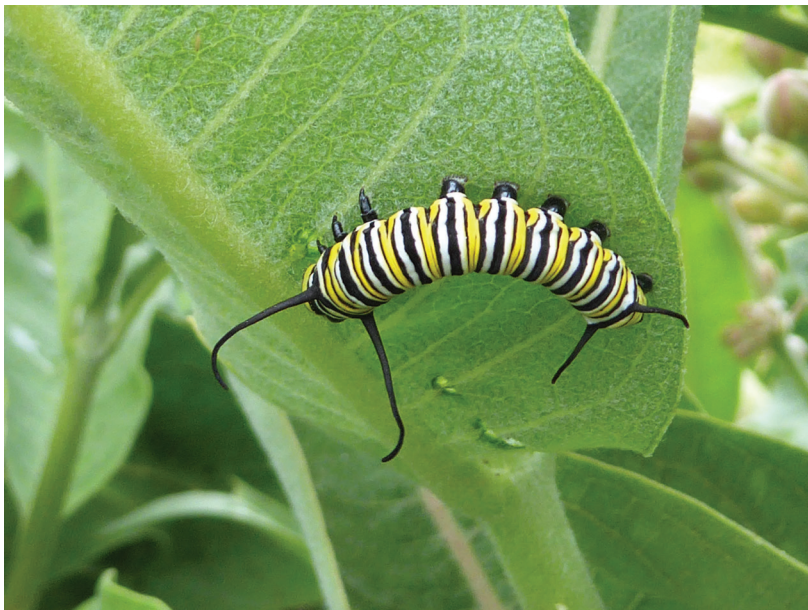


Photo by Beth Waterbury

FLOWERS: BUTTERFLY BEACONS

Butterflies and plants need each other. Butterflies sip nectar from flowers. As they sip, butterflies pollinate the flowers. Plants have developed many ways to attract butterflies to their flowers.

Some butterflies like plants that have lots of small flowers close together. Clusters of flowers let the butterfly sit and sip nectar from many flowers without having to move. This helps the butterfly conserve energy while it's eating.

Most butterflies and insects can see a kind of light called ultraviolet light. Ultraviolet light is something that humans can't see. If you looked at a flower under a purple light, it would look differently than it does in daylight. The purple light allows you to see patterns on the flower that reflect ultraviolet light. You would see lines of white going down the flower petals. It's like the flower has airport runway lights to guide insects to and from the nectar deep inside the flower.

Most butterflies like flowers that are pink, red, purple and yellow. Butterflies may like flowers that are these colors, but butterflies may not see the same colors as people. For example, butterflies may not see the color red. Butterflies are drawn to red flowers because of the ultraviolet light the flowers reflect.

Flowers are more than just beautiful. The flowers we enjoy with our eyes and noses also look and smell good to butterflies. The flower's shape, color, scent and secret ultraviolet patterns all come into play. They are beacons, landing platforms and launching pads for pollinators like butterflies.

Next time you see a butterfly drinking from a wildflower, think about why the butterfly chose that flower and not another one. Some things might be easy to see; others may not. The butterfly is getting a tasty treat and getting dusted with pollen. This helps the plant produce seeds. Both butterfly and plant help each other to survive.

Photo by Beth Waterbury

WHAT'S AN INSECT?

They are on the ground, in trees, in soil and in your house. They make up about 80 percent of all known animal species on Earth. Insects are all around us.

Sometimes any small creepy crawlly is called an insect, but to be an insect an animal must meet three important rules. They must have three main body parts—the head, thorax and abdomen, six legs and two antennae (an-TEN-ee).

The head of an insect has the eyes, antennae and mouthparts on it. Insects have two large compound eyes. Compound eyes are faceted. They have more than one lens or surface. Compound eyes look a bit like a honeycomb. Insects may also have up to three simple eyes. You have simple eyes. A simple eye has one surface or facet. Without moving their heads, many insects can see all around themselves.

The thorax, or middle part of an insect, is where the wings and legs are found. All adult insects have legs, but not all insects have wings. Butterflies have four wings.



Most insects breathe through tiny holes on their abdomens called spiracles (SPIR-i-kels). Insects that live in water would drown if they had spiracles, so some water insects breathe with gills just like fish. Other water insects have a sort of snorkel they stick above the water to breathe air.

Insects have an exoskeleton. An exoskeleton is a hard fingernail-like covering on the outside of the insect's body. The exoskeleton is divided into separate pieces called plates. The plates fit together like a puzzle and are held together with soft flexible membranes. The membranes work like rubber bands. They allow the insect to move its body. The exoskeleton can only flex. As insects grow, their exoskeletons become too small. Insects need to shed their exoskeletons, just like snakes shed their skins.

Insects come in all shapes and sizes. Hairy winged beetles and fairyflies are some of the smallest insects. They can fit through the eye of a needle! The longest insect is a 14-inch stick insect found on the island of Borneo. Atlas moths in India have wings that are 12 inches across. Goliath beetles found in Africa are some of the bulkiest and heaviest. They can be as big as a baseball. The giant weta, a cricket found in New Zealand, is the size of a small bird. Wow, what diversity. Insects sure are amazing animals!

A Bug—Squish It!!

Often when we think of insects, we think of things that bite us, sting us or suck our blood. Sometimes it is easier to see the harmful things that insects do and not see their benefits. Can you imagine a world without insects? Sitting around a campfire may be a bit more pleasant, but other things would also be affected. Our lives would be very different. It is unlikely that we would be able to survive on Earth without insects.

Insects help make the food we eat. Insects pollinate more than 200 kinds of crop plants just in the United States. Take away insects and there would be no carrots for salads, no watermelon or apple pie, no vanilla or strawberry ice cream. We would also have a world without chocolate. A tiny fly, no bigger than a pin head, pollinates cacao flowers. Chocolate is made from the seeds found in the cacao seed pod.

There would be no honey, silk, inks or dyes. Insects and insect parts are used to make

jewelry and beads. Insect products are even used to make medicines to fight off infections and help with painful arthritis.

Insects are valuable scientific tools. They have been used for studying ecology and genetics. Because grasshopper and cockroach nerves are similar to humans, they have been used to test the affects chemicals might have on people.

Insects are important parts of the food web. Bats, skunks, raccoons and fish are just some animals that eat insects. Insects are also important decomposers. Think of all the dead trees, dead animals and animal poop there would be with no insects to help clean things up.

Have you ever stopped to watch a butterfly on a flower? Many people like to watch and photograph butterflies and other insects. People in China even keep crickets as pets!

Next time you feel like squishing an insect, think about what the insect does for you. You may think twice about smashing that bug. Well, maybe not mosquitoes!

Tagging & Tracking MONARCHS

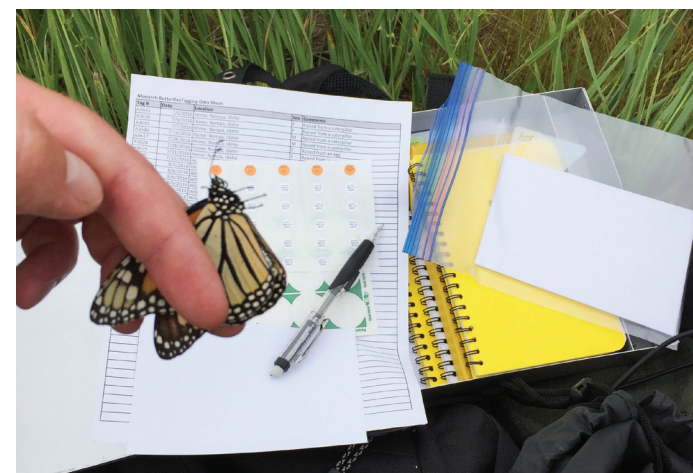
The amazing migration of the monarch butterfly was a mystery until a clever scientist came up with a great idea. Why not place a small sticky tag on a monarch's wing and see if that tagged butterfly is seen again during its migration? That idea led to the discovery of a site in Mexico where millions of monarchs from the U.S. and Canada gather to overwinter each year. But where do monarchs born in Idaho go when they migrate?

Idaho biologists and volunteers are trying to answer that question by tagging monarchs. By knowing the pathways taken by migrating monarchs, actions can be taken to protect and restore the habitats they rely on along their journey.

Tagging a monarch is not as easy as it sounds! First you need to capture them in a butterfly

net. Netting a monarch is challenging—they're very skittish and can see in all directions. Once the butterfly is in the net, biologists reach in and gently remove the monarch with its wings folded together. The monarch is examined to determine its sex and note the condition of its wings—are they raggedy and faded or fresh and strong? The fresh monarchs are best for tagging.

A sticky white tag—about the size of an M&M candy—is firmly pressed on the underside of the monarch's hind wing, so when it perches, the tag is very visible. The tag is printed with a serial number and email address so the observer can report the sighting. The number of tags that are actually reported is quite small in any one year. But you never know....maybe a tagged monarch will cross your path!



Photos by Idaho Fish and Game



Photo by Colleen Moulton

NATURE'S TRANSFORMERS



Photo by Becky Hansis-O'Neill

Can you think of an animal that changes the shape of its body as it grows? How about a butterfly? They change from crawling insects that chew their food to beautiful, flying insect that drink their food. What a change! They go through a metamorphosis.

There are many kinds of metamorphosis in the insect world. There are insects that make big changes, like the butterfly. This is called complete metamorphosis. There are other insects that don't seem to change at all. This is called simple metamorphosis.

Insects with simple metamorphosis have three life stages—egg, nymph and adult. Simple metamorphosis is broken into three kinds. The first is insects that have no metamorphosis. They look the same when they are nymphs and adults. None of these insects have wings. The second is incomplete metamorphosis. Dragonflies are in this group. Insects in this group lay their eggs in water. The nymphs are called naiads (NI-ads). They live in the water and breathe with gills. The adults do not live in water and do not breathe with gills. The last kind of simple metamorphosis is insects with gradual metamorphosis. Grasshoppers are in this group. The nymphs and adults look pretty much the same, and they live in the same habitats.



Insects that have complete metamorphosis have four stages in their life cycle – egg, larva, pupa and adult. The young and adults live in different habitats and often feed on different food. Butterflies are in this group. Butterfly life stages are given special names. The larva is called the caterpillar, and the pupa is called the chrysalis.

Many people think that metamorphosis developed so that each life stage lives in a different habitat. That way the young insects and adult insects do not have to compete with each other for food.

Metamorphosis is amazing to see. If you find a chrysalis, leave it outside, but look at it everyday. You may be able to see the insect changing and developing inside. It is fun to see what will emerge!



Photo by Beth Waterbury

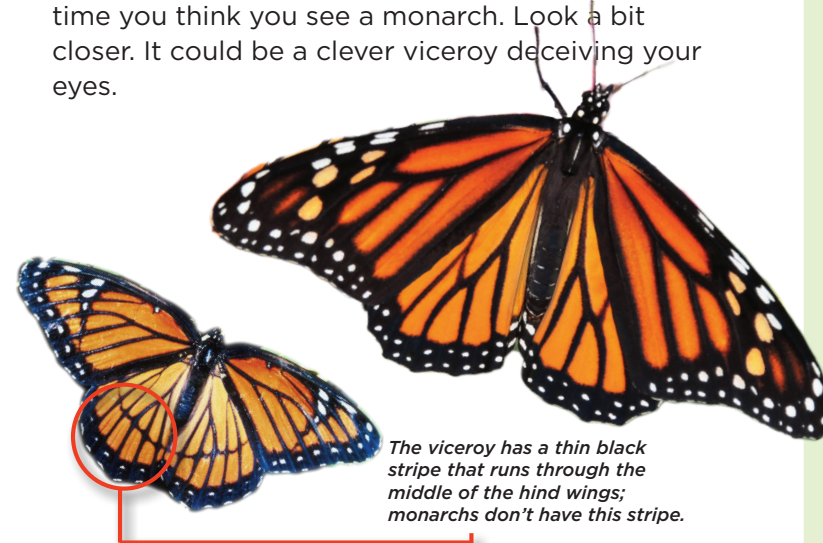
Is It or Isn't It?

Often nature can be deceptive. Sometimes animals, especially insects, will look or act like another insect or object to avoid being eaten or to sneak up on their prey. Mimicry is the word we use when animals resemble each other; camouflage is the word used when animals look like inanimate objects, like rocks or leaves.

The viceroy butterfly is a master of mimicry. It mimics the monarch butterfly to avoid being eaten by predators. Predators that have eaten a monarch learn that orange and black butterflies are to be avoided. Who wants to eat something that will make you sick!

The viceroy butterfly looks very similar to the monarch. It is also orange with black veins on its wings. There are only a few differences that set them apart. Size is one difference. The monarch butterfly is big. Its wingspan is three to four inches. The viceroy is smaller. Its wingspan is only two and one-half to two and three-fourths inches. The viceroy also has a thin black stripe that runs through the middle of the hind wings; monarchs don't have this stripe. There are even small differences when the butterflies are flying. The viceroy glides with its wings held horizontally to the body. The monarch holds its wings at an angle.

Only the adult viceroy uses mimicry. The caterpillar doesn't look like a monarch butterfly at all. The viceroy caterpillar looks like bird poop. No predator would like to eat a bird dropping! Next time you think you see a monarch. Look a bit closer. It could be a clever viceroy deceiving your eyes.



The viceroy has a thin black stripe that runs through the middle of the hind wings; monarchs don't have this stripe.



Bugged About Fishing

Insects are fascinating creatures. From their beautiful colors to their interesting behaviors, insects are worth watching. This is especially true if you like to fish. Many insects are important food sources for fish. Insects like mayflies are fish food in all of their life stages. Others, like grasshoppers, might become fish food if the insect ends up in the water. By observing the insects living around a pond or stream, you can get a pretty good idea of what the fish might be eating.

When you arrive at your fishing spot, spend some time carefully watching for insects. What do you see in the shrubs along the bank? Are any insects sitting on the top of the water? Can you see any nymphs crawling around on the rocks under the water? Is anything buzzing around you?

Once you find some insects, take a look at the flies or lures you brought with you. Try to find something that might match the insects. People who fly fish often have large collections of flies to choose from. Many of these flies look a lot like insects. By carefully comparing their flies to the insects they see, fly fishermen and women can choose a fly that imitates the insects the fish might be eating. With just the right fly, you have a better chance of catching a hungry trout!

If you enjoy fly fishing, you might want to try tying your own flies. This is where your observations of insects can come in handy. If you take a visit to a fly shop, you will see flies that look like mayflies or grasshoppers or midges or bees...the list goes on and on. Who knew that becoming an insect expert could also help you become an expert angler?

Monarch Butterfly Crossword

WORDS

Complete

Crop

Insects

Migrate

Milkweed

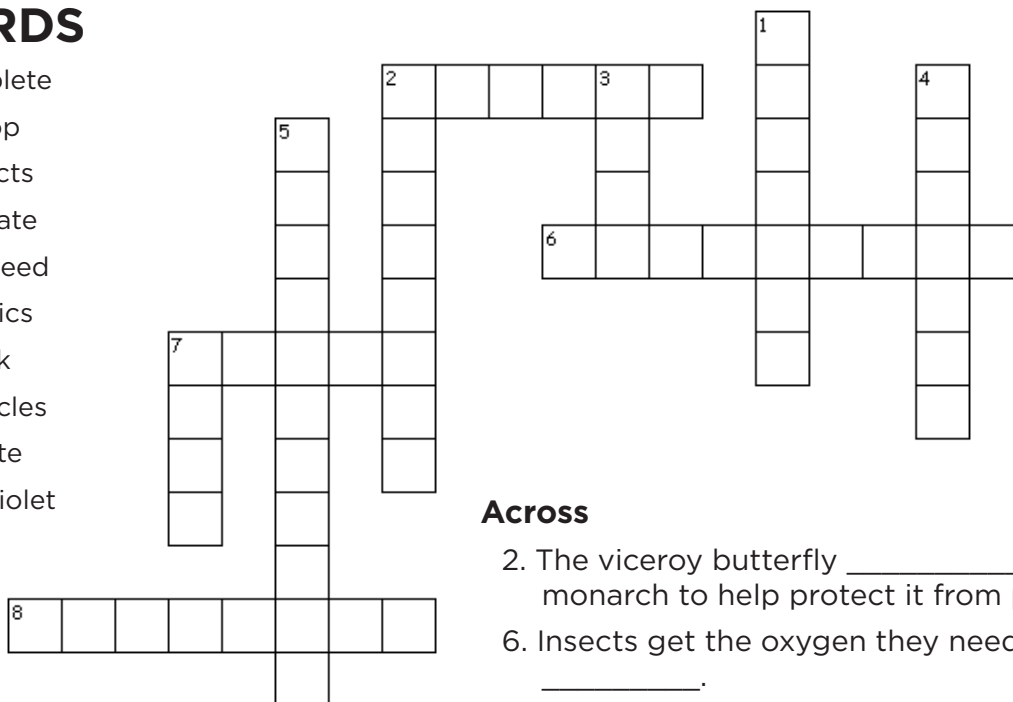
Mimics

Silk

Spiracles

State

Ultraviolet



Across

2. The viceroy butterfly _____ the monarch to help protect it from predators.
6. Insects get the oxygen they need through _____.
7. The monarch butterfly is Idaho's _____ insect.
8. Butterflies go through a _____ metamorphosis.

Down

1. Monarch butterflies travel up to 3,000 miles when they _____.
2. The toxins in _____ build up in the monarch's body and make it awful to eat.
3. Insects pollinate more than 200 kinds of _____ plants in the United States.
4. This is the only arthropod group with three body parts.
5. Butterflies can see _____ light reflected off flowers.
7. Monarch caterpillars can spin _____ from their salivary glands.

WILDLIFE EXPRESS

Monarch Joint Venture Grant Reprint 2018 of Volume 25 • Issue 8 • Monarch Butterfly • April 2012

Wildlife Express is published nine times a year
(September-May)
by the Idaho Department of Fish and Game

Lead Writer: Adare Evans

Layout: Kelly Kennedy Yokoyama

Contributors: Lori Adams, Vicky Runnoe, Beth Waterbury



WE WOULD LIKE TO HEAR FROM YOU!
If you have a letter, poem or question for Wildlife Express,
it may be included in a future issue! Send it to:
adare.evans@idfg.idaho.gov

or

Wildlife Express, Idaho Fish and Game
PO Box 25, Boise, ID 83707