

The title "Wildlife Express!" is rendered in large, colorful, stylized letters. Each letter is decorated with a different wildlife illustration: a cougar on 'W', a rabbit on 'i', a goat on 'l', a snake on 'd', a bear on 'l', a wolf on 'i', a hawk on 'f', a fish on 'E', a frog on 'x', a moose on 'p', a butterfly on 'r', and a chipmunk on 'e'.

# Wildlife Express!

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A photograph of a Calliope Hummingbird in flight, hovering over a cluster of red flowers. The bird is shown in profile, facing left, with its wings spread. The background is dark, making the bird and the bright red flowers stand out.

## The Captivating Calliope Hummingbird

Dr. Lloyd Glenn Ingles © California Academy of Sciences



# Adaptations of Hummingbirds . . .

Hummingbirds are an example of an animal with some amazing adaptations. An adaptation is a characteristic that helps an animal to survive. Snowshoe hares turn white in the winter to blend in with their snowy habitat. That is an adaptation. Great blue herons have long legs to wade in water where they find their food. That is another adaptation.

The long straight bill of hummingbirds is an adaptation for probing into long flowers to find nectar. Tiny calliope hummingbirds have a shorter bill than other Idaho hummingbirds. This allows them to feed on flowers with short tubes like scarlet gilia (hill-EE-a). Their flower tubes are too short for other hummingbirds. Black-chinned hummingbirds have longer bills. They can easily reach the nectar in longer flowers like penstemon (PEN-stem-on). The different bill lengths help make sure that the two different kinds of hummingbirds can both find food.



Andean swordbills are a kind of hummingbird that lives in the South American country of Columbia. This bird has a bill that is almost four and one-half inches long! A kind of passion flower grows where the swordbill lives. Its flower tube is also four and one-half inches long. With its extra-long bill, only the swordbill is adapted to gathering nectar from this species of passion flower. Now, that's quite an adaptation!

## . . . & Adaptations of Hummingbird Flowers

Hummingbirds are not the only ones with adaptations. Flowers that depend upon hummingbirds have evolved some pretty neat adaptations of their own. Over 130 different flowers in western North America are "hummingbird" flowers. They do everything they can to make sure that hummingbirds find them!

Most hummingbird flowers droop down toward the ground. Drooping flowers do not give insects the "landing pad" they need to land on a flower. But hummingbirds can easily hover in front of drooping flowers. Many of these flowers are red or yellow. Hummingbirds can see these colors, but most insects cannot. Hummingbird flowers usually do not smell. Smelly flowers attract insects, not hummingbirds. Hummingbird flowers also contain large amounts of nectar to attract the birds.

All these adaptations seem like a lot of work just to attract hummingbirds, but the hummingbirds don't just get food from the flowers. They also pollinate the flowers. As a hummingbird feeds, its head and face brush against pollen. Some flowers have their pollen-carrying structures placed so a hummingbird will be sure to hit them. As the bird moves from one flower to another, it brushes against more pollen. Pollen is exchanged between plants, and the flowers are pollinated. By pollinating its food source, the hummingbirds make sure that they will have food again next year.



# Fill the Bill



Looking at bird beaks is a good way to see adaptation at work. Just look at the hummingbirds. Their bills can be long or short, straight or curved. Some hummingbirds even have beaks that curve up or curve down. Each of these different beaks help hummingbirds gather nectar from certain kinds of flowers. Can you imagine a bird like a chickadee trying to get flower nectar? No way! But a hummingbird could not break open a sunflower seed the way a chickadee can.

One way to think about bird beaks is to think of them as tools for finding food. A duck called a northern shoveler has a very wide bill that works like a sieve. Water goes through bristles on the duck's beak, but tiny plants stay in the duck's mouth so it can eat. Warblers have short, thin beaks that they use to catch insects the same way you would use a pair of tweezers. What about the woodpeckers? Their stout beaks are made for making holes in wood. You would need to use a drill to make a hole in wood. Many seed-eating birds have short heavy beaks to break open tough seeds. Sparrows, chickadees, and grosbeaks all have powerful beaks that work like nutcrackers to open seeds. The sharp beaks of hawks, eagles and osprey help these birds tear meat. You have to use a knife and fork to eat your steak dinner. Birds that catch flying insects often have very small beaks but large mouths. They swoop through the air using their beak and mouth like a butterfly net to catch insects. Both the kingfisher and the great blue heron have long stout bills that they use to catch fish. Could you catch a fish with your mouth?

# Glittering Feathers

If you watch a hummingbird, you notice the beautiful metallic feathers. They shine and glitter in the sun with incredible colors. Then suddenly the hummingbird turns and all the beautiful colors are gone. What happened?

The shiny, metallic feather colors you see are caused by iridescence (ear-a-DES-sense). In hummingbirds, the most brightly colored iridescent feathers are present in the gorget (GORE-jet) of the male. The gorget is found on the throat and upper chest. Gorget feathers can be puffed out in some species when the male is displaying for a female or another male.

The iridescence you see is caused by the way light hits the feathers. Light is made of waves. These waves have different sizes or lengths. When wavelengths hit a feather, they are reflected (like a mirror or a bubble) or broken apart. This makes some wavelengths stronger and others weaker. The weak wavelengths can no longer be seen.

Feathers become iridescent when they have a fine coating on them. This coating acts like a soap bubble to reflect light. When light hits a feather, the coating scatters the light. We see the brilliant shimmering colors reflected back at us. But we can only see this reflected light when it hits the feather at just the right angle. When the bird moves, the light changes and the iridescence disappears.

The gorget colors can help you identify Idaho's hummingbirds. Calliope hummingbirds have a gorget that is made up of purplish-red stripes. Rufous hummingbirds have a very bright metallic flame-colored gorget. If you see a hummingbird with a rosy-red gorget, it is a broad-tailed hummingbird. Idaho's most uncommon hummingbird, the black-chinned hummingbird has a gorget with two colors. Like its name, the chin of this bird is a beautiful velvet-black. Underneath the black is a band of violet feathers.



# Meet the Hummingbirds

Woodstar, mountain gem, sunbeam, and sunangel are just a few of the names people have called hummingbirds. This neat group of birds is found only in the New World. That means that unless you live in North or South America, you will not see hummingbirds!

The hummingbird family is made up of about 340 different species. Most of them live in warm tropical places near the Equator. Here in the United States, 19 different hummingbirds can be found. Four of those spend the summer in Idaho: rufous hummingbird, calliope hummingbird, broad-tailed hummingbird and black-chinned hummingbird.

Hummingbirds range in size from the tiny two and one-half inch bumblebee hummingbird to larger eight-inch tropical species. In the United States, most hummingbirds are about four inches in size. No matter what their size, hummingbirds are pretty amazing! Like all birds, they can fly forwards, but they can also hover and are the only bird that can fly backwards. Being able to fly in so many directions allows hummingbirds to reach the flower nectar they need.

Hummingbirds can fly in so many different directions because of their wings. Their long pointed wings rotate at the shoulder. The wrist and elbow hardly move at all. When a hummingbird hovers, its wings make a horizontal figure "8" in the air. This makes the wings act like oars in the air, so the hummingbird can stay in one place while it feeds on a flower. The wings are powered by huge pectoral muscles. These are the muscles on your chest on each side of your sternum or breastbone. In most birds, the pectoral muscles make up 15% to 20% of a bird's body mass or size. In hummingbirds, pectoral muscles make up 30% of the body mass! Now you know why a hummingbird can beat its wings 70 to 80 times in one second.

Another large part of a hummingbird is its brain. These birds have the largest brains of any bird when compared to the bird's size. This big brain gives hummingbirds excellent memories. Having an excellent memory helps the bird return to good food sources and nesting places every year. This means that the hummingbirds at your feeder last summer might be the same ones you see this summer!

# Life in the Fast Lane

Like most small warm-blooded animals, hummingbirds have a very high metabolism (met-TA-bowl-ism). This means that all their body functions like digestion, respiration and blood circulation happen very quickly. Hummingbirds have metabolisms that are the fastest of the fast.

Your heart beats about 70 times each minute when you are resting. A hummingbird's resting heart rate is about 1,000 beats a minute. You breathe 12 to 20 times a minute, unless you are exercising. A hummingbird breathes almost 250 times each minute. Hummingbirds also have a body temperature of around 104 degrees. This high temperature is why hummingbirds do not have warm down feathers; they would get too hot. If your metabolism was as fast as a hummingbird, you would have to eat twice your weight in food every day, and your temperature would rise to 752 degrees!

This high metabolism is why hummingbirds eat flower nectar. Nectar is full of sugar which gives the birds quick energy, but this energy does not last long. Hummingbirds have to spend most of their time eating just to stay alive. Hummingbirds also eat tiny insects to get protein and minerals. They need to spend time hunting for this important part of their diet, too.

Night can be tough on hummingbirds. In many places, it gets cool at night. Without insulating down and stored fat, hummingbirds in northern states, like Idaho, cannot stay warm until morning. So instead of sleeping like you, they go into a kind of nighttime hibernation called "torpor." During torpor, a hummingbird's metabolism slows down. Its heart beats slowly; it breathes slowly; and its temperature drops. It uses very little energy. When morning comes, the hummingbird comes out of torpor quickly. Then it is off to spend another day zipping around to find the energy it needs to survive.



# Let's Look At...

# Calliope Hummingbird



Did you know that the smallest bird in North America spends the summer in Idaho? Did you know that this bird's Latin name means "little star?" This little star is the calliope hummingbird. It calls Idaho "home" during the spring and summer.

Most hummingbirds are pretty small. But even by hummingbird standards, the three-inch calliope is tiny. With its short beak and tail and four-inch wingspan, it might weigh as much as two pennies. In spite of its size, these birds travel nearly 5,400 miles every year. This journey takes them from winter homes in southern Mexico to the northern Rocky Mountains. All that flying makes the calliope hummingbird the smallest long-distance migrant in the world!



Male calliope hummingbirds are easy to identify. They have brilliant greenish bronze backs with light gray bellies. Their throat is white with magenta-red stripes that look like a peppermint candy. The females are not as brightly colored and have light freckles on their throats.

In May, calliope hummingbirds arrive in Idaho where they live in higher elevation mountain meadows or open forests. Here, they feed on flowers like columbine and paintbrush, as well as small insects. Male calliopes find a territory and defend it against other male hummingbirds and sometimes birds as large as crows!

Once the male has a territory and the females arrive, courtship begins. Like most male hummingbirds, calliopes display to attract a female. He will fly 30 to 90 feet into the air and make a steep dive. During this dive, the bird's wing feathers make a buzzing sound. Male calliopes will also "hover display" near a female. Both the male and female will fly in circles around each other.

Once mating occurs, the female begins the job of nest-building. Calliope hummingbirds like to nest in trees like pines, fir or spruces. Often the nest is placed in a cluster of old cones or on a branch directly underneath another branch. The nest is made of soft plant fibers and held together with spider webs. Female hummingbirds decorate the outside of their nest with pieces of lichen (LIKE-in), moss, or bark. This decoration helps camouflage the nest. Calliope hummingbirds often reuse the same nest. They build a new nest on top of the old one for as many as four years in a row!

Two white eggs the size of your little fingernail are laid in the nest. After hatching, the young hummingbirds are fed insects by the female. Insects provide the protein young hummingbirds need to grow rapidly. They are able to leave the nest in about 21 days. The young hummingbirds will spend the rest of the summer getting ready to migrate. Adult calliope hummingbirds migrate before the youngsters. By late summer, Idaho says farewell to the smallest bird in North America.



# Feeding Hummingbirds

Watching hummingbirds is one of the joys of summer. One of the best ways to observe Idaho's hummingbirds is to put up a hummingbird feeder. Hummingbirds are easily attracted to feeders especially if you already have a bird-friendly yard. You can get a hummingbird feeder at most stores that sell bird seed. Make sure to buy a glass feeder. They are easier to keep clean and last longer than plastic feeders. Your feeder should have red plastic feeding ports that are usually shaped like flowers. This red color on your feeder will help attract the hummingbirds. Hummers are very nosy and will check out just about anything that is red.

You want to feed hummingbirds a sugar-water solution. Never use honey instead of sugar! Honey can cause a fungal growth in the bird's mouth that can kill the bird. Mix your solution in a ratio of four parts water to one part sugar. With an adult's help, heat your water to boiling. Add the sugar and stir well until the sugar is dissolved. Allow the solution to gently simmer for about five minutes. Let it cool, fill your feeder and hang it up. You should not add any red food coloring to the solution. The red feeding ports will be enough to attract the birds.

Be sure to change your solution and clean your feeder every week if the birds are not emptying the feeder quickly. During hot weather you should empty and clean your feeders more frequently than once a week. If you have quite a few hummingbirds using your feeder, put up another feeder. This will reduce competition. Remember to leave your feeder up until the end of September. Your feeder could be an important feeding stop for migrating hummingbirds in the fall.



Dr. Lloyd Glenn Ingles © California Academy of Sciences

# Migration



Photo Credit Ann Cook ©

*A ruby-throated hummingbird will store enough fat to fly across the Gulf of Mexico.*

Every spring and fall, many kinds of birds make great journeys to and from their nesting grounds. Some fly only a few hundred miles. Others fly many thousands of miles. No matter how far birds fly, migration has fascinated humans for centuries.

Migration is a regular movement of a population to and from an area. Usually this movement has to do with food or breeding. Many kinds of animals migrate. Caribou in the Arctic migrate across the tundra. Monarch butterflies migrate to Mexico. Several species of dragonflies migrate, but when you think of migration, you probably think of birds.

In the spring, the days get longer. Birds sense this with part of their brain called the hypothalamus (HI-po-thal-a-mus). The hypothalamus sends out chemicals called hormones to the brain. These chemicals tell the birds to start eating----a lot! They need to eat to store fat for their journey. Some birds gain almost half their body weight by the time they migrate. If you are a 70-pound 4th grader, you would have to gain 35 pounds in just a few weeks! The fat a small songbird stores will allow it to fly 600 miles all at once. A ruby-throated hummingbird will store enough fat to fly across the Gulf of Mexico. That's 480 miles!

Once the birds leave, how do they find their way? As it turns out, birds use several ways of navigating. Birds that migrate during the day, such as hawks, robins and bluebirds, use the sun to migrate. This is called a "sun compass." Like us, birds can use the sun to tell direction and find their way. Many songbirds migrate at night and use the position of the stars in the sky. Birds can also use a "magnetic compass" to tell direction, just like you use a compass. They also use the pattern of polarized light in the sky, because it can be "seen" even when it is cloudy. We cannot see polarized light, but it sure helps the birds.

The bird with the longest migration is a small seabird called a sooty shearwater. These birds travel the entire Pacific Ocean during their migration. That's almost 40,000 miles every year! No wonder we humans are so amazed by migration!

# Calliope Hummingbird Word Search

## Words

**CALLIOPE  
COLORS  
INSECTS  
HOVER  
TORPOR  
NECTAR  
MEMORIES  
SPIDERWEBS  
MEXICO  
HUMMINGBIRDS**

R	D	C	W	S	B	E	B	D	M	M	S	N	U	Q
Y	O	M	A	C	R	F	L	N	Q	D	A	M	S	Q
K	N	E	P	L	V	O	O	J	R	L	I	E	H	V
J	V	C	K	S	L	I	L	I	X	W	T	M	H	S
B	F	T	U	Z	N	I	B	O	N	R	L	O	C	G
T	V	X	Z	S	R	G	O	N	C	O	H	R	S	M
K	M	N	E	A	N	U	I	P	M	P	T	I	U	J
J	I	C	T	I	S	P	I	D	E	R	W	E	B	S
W	T	C	M	G	Q	Y	S	S	Q	O	A	S	K	H
S	E	M	G	S	L	U	A	T	R	T	G	O	T	C
N	U	T	S	E	H	I	Y	Y	C	T	E	C	F	T
H	H	O	V	E	R	L	S	J	O	K	U	I	N	J
R	T	D	E	S	P	D	O	C	I	X	E	M	W	X
N	B	D	D	T	W	K	L	Z	A	R	O	T	N	H

1. These are the glue that keep hummingbird nests from falling apart.
2. Hummingbirds eat these to get the protein they need.
3. The smallest North American bird.
4. Where the calliope hummingbird spends the winter.
5. Hummingbirds' beaks are specially designed to get this out of flowers.
6. Hummingbirds have large brains and wonderful \_\_\_\_\_.
7. At night, hummingbirds enter this state to conserve energy.
8. Hummingbird wings need to make a figure "8" to do this.
9. These are only found in North America and South America.
10. Hummingbird feathers reflect light to make the \_\_\_\_\_ we see.

### WILDLIFE EXPRESS

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### 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 the address printed above!