

Hummingbirds at Risk



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**THE FLYING JEWELS OF BRITISH COLUMBIA
ARE ON THE DECLINE, BUT THERE ARE
THINGS YOU CAN DO TO HELP**



A male rufous hummingbird visits a nectar flower.

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Shortly before COVID, Thomas Schuster and Christine Norcross attached a nectar feeder on the window of their ground-floor condo apartment in Vancouver as an experiment to see if they could attract hummingbirds to their backyard. As they worked from home during the pandemic, the couple started watching the tiny birds that visited the feeder on a daily basis.

To their great surprise, they realized that a female Anna's hummingbird had started to build a nest in their garden in the late winter, well camouflaged in the thick yew hedge that separated their patio from the busy street. "We were super excited," Norcross said. "We felt lucky that she was so close for us to have a chance to watch from the window."

The couple, both geologists and nature lovers, followed every single parenting step, from nest building to egg incubation and feeding up to the moment the two hummingbird nestlings left the nest. "They became part of our life and our routine. We were very careful not to disturb them, but they also were curious about us," Schuster said.

ANNA'S HUMMINGBIRDS HAVE often been called flying jewels, displaying an impressive assortment of colours. The adult males have a bright reddish-pink crown and throat while the females have green backs and iridescent specks of pink and red on their throats.

Norcross and Schuster are amongst many people who are captivated by Anna's hummingbirds. In 2017, the bird was named the City of Vancouver's official bird following a vote by city residents.

As the only species of hummingbird in North America that resides year-round in the Pacific Northwest region, Anna's hummingbirds have adapted to live alongside people in urban areas, taking advantage of unusual nesting spots like plant hooks, outdoor lights, electrical wires and patio decorations. They help build city dwellers' connection to nature.

"The disadvantage of living in the city is that you never feel that you are around nature," Norcross said. "So to have this hummingbird at our fingertips right outside in our tiny yard, this was huge for us. You can't ask for more when you are a condo dweller in the city. This is what everybody hopes for."

Anna's hummingbirds are one of five species of hummingbirds that can be seen in British Columbia: the rufous, calliope and black-chinned species occur primarily on the west side of the Rockies, while the ruby-throated hummingbird occurs to the east. Anna's hummingbirds are a new arrival in BC. Since the 1930s, they have expanded north and east from a range that was previously restricted to

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coastal California. They now can be seen as far north as southern Alaska. They first arrived in BC in the 1940s and over the past two decades, populations have increased dramatically. Many birds now overwinter and breed in those northern latitudes rather than flying south.

This rapid range expansion, particularly into colder regions such as the Pacific Northwest, is believed to be due to

the fact that more people are providing nectar feeders and planting exotic flowers that bloom in different seasons in urban and suburban gardens. The warming climate is also a factor. Anna's hummingbirds may possess physiological and behavioural adaptations that allow them to withstand the extreme cold weather in Canada and may benefit from the "heat island" effect in urban centres. "They are tolerating cold temperatures. They are also using the warmth of buildings and finding spiders and other insects around buildings to supplement them when it's cold in the winter," said Christine Bishop, emeritus research scientist with Environment and Climate Change Canada who



Two rufous hummingbirds feed on nectar. On average, hummingbirds visit between 1,000 and 2,000 flowers every day.

studies hummingbirds.

Even though they have learned to live in close proximity to humans, the unique and specialized features of Anna’s hummingbirds—and other hummingbird species—remain largely unknown to most people and have intrigued scientists for decades. Hummingbirds are amongst the smallest birds in the world, but no other feathered creature can match their aerial acrobatics. They can fly forward, backwards, sideways and even upside down.

“There are no other vertebrates that can sustain hovering like hummingbirds do,” says Doug Altshuler, a zoologist at the University of British Columbia who

has been studying hummingbirds for nearly 30 years, using high-speed cameras to track their flight patterns. “They are such an interesting animal to gain insight into brain function, mechanical function and muscle function because they combine many of the best features of both invertebrate and vertebrate animals.” With his research on hummingbirds, Altshuler is hoping to learn more about how the brain works, with a potential greater understanding of human motor neuron diseases.

ALTHOUGH HUMMINGBIRDS possess these unique abilities, their future is uncertain. Except for Anna’s hum-

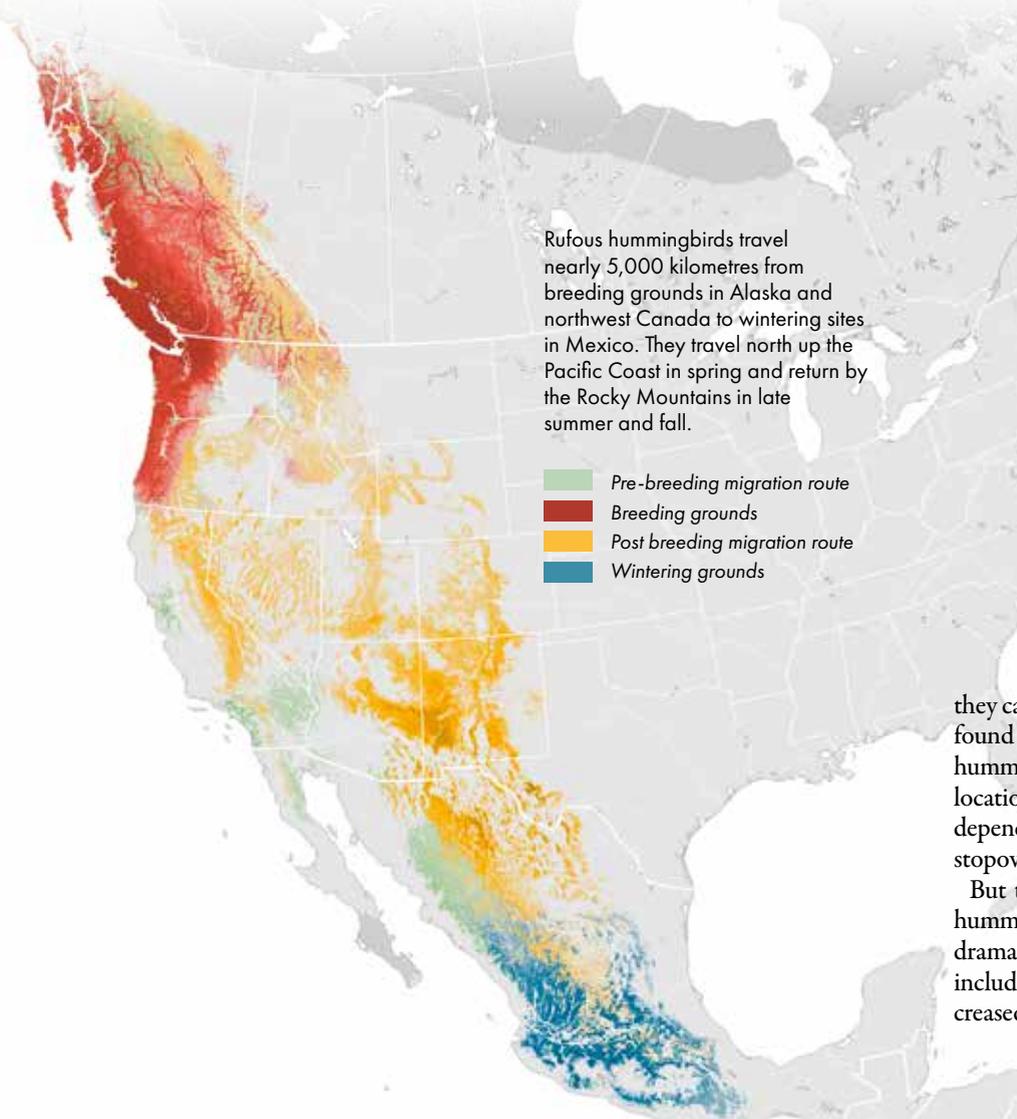
mingbirds, other species are undergoing significant population declines. A study published in 2021 that examined the population trends for eight North American hummingbird species from the Breeding Bird Survey revealed that Allen’s, rufous and broad-tailed hummingbirds have all declined since 1970, and the rate of decline increased from 2009 to 2019. Ruby-throated hummingbirds—found in Eastern North America—have also declined by 17 percent between 2004 and 2019, after several decades of population increase. Two other species—black-chinned and calliope hummingbirds—also showed declines between 1997 and 2021. ▶

“Things have gotten worse in the last 10 years. Where populations were stable, they are looking less stable and where populations were decreasing, they are decreasing more quickly,” noted Simon English, a graduate researcher at UBC and lead author of the study. “While Anna’s hummingbirds have taken advantage of feeders in urban areas, other species prefer a more natural, forested habitats,” added Bishop, who co-authored the study. “If you are a city bird, things are going better for you than if you are a forested habitat bird.”

Amongst the declines, the rufous hummingbirds have experienced the most dramatic changes, with a population decrease of 65 percent from 1970 to 2019. Researchers are particularly concerned by the steady decline in the survival rate of juvenile birds.

WITH ITS EASILY identifiable orange throat, the arrival of the rufous hummingbird in British Columbia is a sign of spring. Weighing about three grams, they make one of the longest migratory journeys of any bird in the world measured as distance travelled relative to body length. Every year, they travel 5,000 kilometres (one-way) between their wintering sites in Mexico to breeding locations in Western North America, as far north as coastal southeastern Alaska. Canada hosts about 57 percent of the global breeding population of rufous hummingbirds, almost entirely within the province of British Columbia.

As a long-distance migratory species, rufous hummingbirds use diverse habitats over large geographical areas. Bishop and other researchers have been putting bands on hummingbirds’ legs for years so



Rufous hummingbirds travel nearly 5,000 kilometres from breeding grounds in Alaska and northwest Canada to wintering sites in Mexico. They travel north up the Pacific Coast in spring and return by the Rocky Mountains in late summer and fall.

- Pre-breeding migration route
- Breeding grounds
- Post breeding migration route
- Wintering grounds

they can monitor the population. Bishop found that up to 25 percent of rufous hummingbirds come back to the same location. “They are a bird that is really depending on the reliability of migration stopovers,” she said.

But the landscapes through which the hummingbirds travel have experienced dramatic changes over the past century, including warmer, drier conditions, increased wildfires, the loss of wetlands,



A female Anna's hummingbird feeds her nestlings.

conversion of land to agriculture, urban development, invasive species and the use of pesticides in agriculture and forestry. Young birds on their first migration may face even greater risk. “Hummingbirds depend on nectar and they depend on insects and both of those things are running in short supply with more impacts on habitat quantity and quality,” Bishop said.

Researchers also note that rufous hum-

mingbird survival declined strongly in areas with higher human population density, the very reason that also facilitated the range expansion of Anna's hummingbirds. “This represents instability in the ecosystem,” English commented.

Climate change may additionally cause a mismatch between the migration timing of rufous hummingbirds and the bloom of nectar-producing flowers the birds rely on for feeding in the spring.

With extreme heat, nectar sources can also dry up. In addition to consuming insects and spiders which provide protein, fat and salts, hummingbirds drink large quantities of nectar—two to four times their body weight a day—which contains sugar and is a good source of energy. On average, hummingbirds visit between 1,000 and 2,000 flowers every day.

Invasive species can add to the challenges the birds are already facing. For ▶

example, rufous hummingbirds time their arrival on the BC coast with the blooming of salmonberry in the spring. However, salmonberry is losing ground to the invasive Himalayan blackberry, which blooms in June, too late for the birds on their migratory journey.

Of the range of threats faced by the rufous hummingbirds, Bishop was particularly concerned about their potential exposure to pesticides. Like bees, hummingbirds are important pollinators, and as such could be impacted by neonicotinoids (neonics) as they fly from one flower bloom to another searching for nectar. The harmful impacts of neonics—the most widely used class of insecticides in the global market—on bees have already been studied but had never been measured in hummingbirds.

IN 2015, BISHOP and her team began collecting urine and feces samples from rufous and Anna's hummingbirds to determine exposure to neonics in the agricultural region of the Fraser Valley, where pesticides are used for the rapidly expanding blueberry production. They also tested for pesticides in hummingbirds that lived in suburban and rural



Christine Norcross brings the orphaned hummingbird nestlings she rescued in her backyard garden to the Wildlife Rescue Association of BC.

IF YOU FIND AN INJURED OR ORPHANED HUMMINGBIRD

A mother hummingbird rarely abandons a nest, but in some cases the chicks are left to fend for themselves if something happens to mom. She may have been hit by a car or caught by a cat. If you suspect a nest has been abandoned, you must watch continuously from a distance for at least an hour, sometimes more, to be sure mom is not returning. Don't look away as she is quick! Feedings can be surprisingly infrequent in some stages of the chicks' development. Contact your local wildlife rehabilitation centre for instructions. Never try to nurse or raise a hummingbird or any other bird on your own. They are delicate creatures and can be easily injured if handled.

areas and in high altitude sites further away from agricultural activity. Neonics spread rapidly through the environment in runoff due to high water solubility and their persistence in plants and soil. The impacts on wildlife are multifaceted, as the pesticides escape from agricultural fields into aquatic systems and impact non-crop nectar plants. Additionally, the pesticides kill or contaminate the insects that the hummingbirds rely on as a food source. "Prior to our work, there was not even a consideration that there would be a risk for pesticide exposure in hummingbirds," Bishop said.

BISHOP FOUND HIGH levels of pesticide exposure in both Anna's and rufous hummingbirds that lived near sprayed blueberry fields, but also detected the harmful chemicals in birds that lived away from agricultural areas. "There are a lot of opportunities for birds to be exposed if they are feeding on nectar and insects,"

Bishop said. For example, hummingbirds can be exposed to contaminated nectar flowers originating from nurseries and planted in suburban gardens.

As Health Canada adopted restrictions on the use of neonicotinoid pesticides in the spring 2021, researchers further measured whether the regulation made a difference for the hummingbirds. They found that new replacement pesticide concentrations had increased in hummingbird urine by a factor of more than seven before the old neonicotinoid pesticides they were replacing had even dissipated or degraded in the surrounding environment.

In the only experimental study that measured impacts of pesticides on hummingbirds, researchers found that a short-term exposure significantly reduced the energy levels of captive ruby-throated hummingbirds. "This is going to interfere with the behaviours of hummingbirds who require a certain amount

of energy for survival through cold nights, reproduction, migration or any of the high energy tasks they must endure during their life cycle,” said English, study co-author. “Current intensive agricultural practices present a slew of threats to hummingbirds and other species, and also to humans because we rely on these ecosystems as well,” he concluded.

ALISON MORAN, DIRECTOR of the Hummingbird Project at Rocky Point Bird Observatory in Victoria, has been monitoring and banding hummingbirds for over 25 years. She hopes that the emotional connection that many people have now developed with the Anna’s hummingbirds that live close to them can help support more conservation action for all hummingbird species, for example by ensuring that the ponds and wetland areas the birds rely on for insects are increased and protected. “It is vital to protect every aquatic source, the wetlands around the landscape but also little ponds in backyards.” Moran said.

Since they have been observing Anna’s hummingbirds in their own backyard in Vancouver, Schuster and Norcross have developed a new appreciation for birds. “Anna’s hummingbirds have expanded our knowledge of birds, bird life, and bird habitat,” Schuster said.

While Anna’s hummingbirds can serve as charismatic ambassadors for bird conservation, their urban lifestyle comes with many risks: they can be caught by house cats, crash into windows or be hit by cars. They can also die from drinking out of dirty nectar feeders. There might be other threats that researchers do not fully understand yet.

Schuster and Norcross personally experienced the vulnerability of Anna’s hummingbirds in the city when a female built another nest in their backyard. The eggs successfully hatched, but one evening, the hummingbird mother never came back to feed the nestlings. After carefully monitoring the situation, the couple had to step in and brought the nestlings to the Wildlife Rescue Association of BC.

In the last 10 years, the organization saw a massive increase in the number of hummingbirds admitted for care, from 16 birds in 2010 to a record number of 322 in 2021. “Hitting windows is the

number one reason why hummingbirds are brought to us, followed by cat attacks,” said co-executive director Linda Bakker. Hummingbirds can also catch a fungal disease from nectar feeders that have not been properly cleaned. “Most of the injuries that we see are related to the human presence,” Bakker said. “We also see a lot of Anna’s hummingbirds when it is really cold in the winter and they are struggling.”

The association indicates that the sur-

vival rate of hummingbirds in their care is about 50 percent. About a month after Norcross and Schuster brought in their one-week-old orphaned nestlings, one of them was successfully rehabilitated and released.

“They are amazingly resilient and yet when you look at them, they are incredibly fragile too,” Norcross said of the rescue. “Human beings have done a lot of damage to the natural world and it’s nice on the good side and coexist together.” 🐦

LIVING WITH HUMMINGBIRDS

- A hummingbird that visits your garden or balcony is a special treat. You can take a few simple actions to create a welcoming and safe landscape for your tiny guests that will meet their needs for food, water and shelter.
- Plant a variety of native, nectar-rich flowers on your patio, back garden, or even apartment balcony. Install a moving water feature or a pond. Add high perches for the birds to rest and shrubs that serve as cover for nesting and protection from the weather. Native trees and shrubs require minimal maintenance once established and serve as food plants for the insects hummingbirds like to eat.
- Do not use pesticides and keep cats indoors. It is safer for cats and hummingbirds. Prevent deadly glass collisions by making windows visible to birds.
- Hang a feeder (high enough, safe from cats) filled with sugar water. A solution of four-parts water to one-part white table sugar is easy to prepare and similar to the natural nectar of flowers. Boil the mix and let it cool. Avoid other types of sugar or honey. Never add dyes and do not use commercial feeder mixes which contain chemicals that are harmful to the birds. Feeders must be cleaned in hot water and refilled every two to three days. If hummers drink a contaminated solution, they can become ill.
- On a larger scale, help preserve local ecosystems and wildlife by supporting community parks, open space preservation, and wetland restoration projects. Support sustainable agricultural practices that consider biodiversity.



A female Anna's hummingbird drinks from a feeder filled with sugar water.