



U.S. Fish & Wildlife Service

Yreka Fish and Wildlife Office

Summer-Fall 2020 Newsletter

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Pollinator Edition



Notes from the Field Supervisor

In the 1990's, while doing my graduate work, I had the good fortune to visit one of the Monarch butterfly reserves located in the Mexican State of Michoacan. Monarchs (*Danneus plexippus*) migrate south along eastern and western routes crossing the U.S. to overwinter in warm places, such as Mexico and southern California. In the spring, they head north again, some going as far as Canada to breed. It's an epic journey to be made by such small winged insects. When I visited the reserve, I vividly recall the awe I felt witnessing millions of monarchs flying in formation along super-highways five to seven feet above the ground between roosting sites. There was an upper highway of magnificent wings all going in one direction, and a lower highway directly beneath, going in the exact opposite direction. It seemed miraculous and yet perfectly orchestrated.

Unfortunately, some pollinator populations, including butterflies and bumblebees, are in rapid decline. In this issue of our newsletter you will read how loss of the plants and habitat they need to survive, in addition to disease, parasites, pesticides, and a changing climate, is having a heavy impact. Pollinators play a critical role in agriculture. Our food supply depends on them.

The thing about losing biodiversity is that you never know when you are getting close to losing an element that is critical to holding the ecosystem together. Ecosystems are like any other system, mechanical or biological. You never know how many nuts and bolts you can lose before your equipment falls apart.

In this issue, you will read about some of the things we are doing to support the recovery of declining populations of species. A great example is our nation-wide agreement with transportation and utility companies to preserve and protect habitat for monarch butterflies. We are also engaging young scholars, such as the two interns you will read about from the Directorate Fellows Program (DFP) who we worked with this summer. At the local level, the Yreka FWO is taking every opportunity to reach out through the schools in our community to share our knowledge, and to collaborate with groups like the Xerces Society and the Cascade-Siskiyou National Monument to survey and monitor pollinator species.

Finally, we would like to invite you to participate in our pollinator garden contest in 2021. We'll be teaming up with the Siskiyou County Beekeeper's Association, Siskiyou Gardens, Parks and Greenways Association, the Yreka Garden Club and others. During these extraordinary times of global pandemic, widespread wildfire and periods of heavy smoke, this will be a welcome diversion for many of us who enjoy spending time in our gardens. So, if you are interested in helping to conserve bees and butterflies, stay tuned for more details about how you can get involved!



*Jenny Ericson, Field Supervisor
Yreka Fish and Wildlife Office*





Beleaguered Bumblebees

When you think of a bee, you probably picture a honey bee and a bear-shaped bottle, but there are over 3,600 bee species native to the U.S. and Canada. This diverse list includes bumblebees, wood-dwelling carpenter bees, nocturnal sweat bees, and cuckoo bees that commandeer other bee colonies to tend their own queens. Though these bees don't produce honey, they play crucial roles in local, wild ecosystems as pollinators, helping native plants and wildlife flourish.

The Klamath Basin hosts a high diversity of bumblebees (*Bombus spp.*), with at least 25 species.

Bumblebees are efficient and intelligent pollinators that are uniquely adapted to cool, high elevation conditions due to their large and hairy bodies, and heat regulation abilities. Unlike honey bees that overwinter in colonies, bumblebees have an annual life cycle. Each year, a queen emerges from her overwintering site, starts a colony of female worker bees, and later produces new queens and male bees. Mating occurs late in the season. The new queens overwinter in leaf litter or animal burrows while the original colony dies.

Unfortunately, many of these vital pollinators have declined significantly

in recent years, due to a combination of threats. Land use change, including agriculture and grazing, decreases available bee habitat and food resources.

Agricultural monocultures that only flower for a few weeks have replaced diverse meadows with native plants that produce nectar and pollen throughout the growing season. Similarly, other human activities reduce the availability of nesting and overwintering habitats and their connectivity to foraging locations.

Pesticides also threaten bumblebees and other pollinators. Neonicotinoid pesticides are widely used, particularly in agricultural areas, and are especially harmful to bees. These chemicals are absorbed into the plant and ingested by bees through the pollen and nectar. While not instantly fatal, these neurotoxins impair the bees' navigational system and foraging efficiency, ultimately decreasing the number of new queens produced the next year.

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Top: A newly emerged white-shouldered bumblebee queen (*Bombus appositus*) that was netted during a field survey in Jackson County, Oregon. The Klamath Basin has over 25 species of bumblebees known to occur within this unique range.

Left: The seasonal life cycle of a bumblebee: overwintering queen (winter), nesting queen establishing colony (spring), workers foraging (summer), new queens mating and old colony dying (fall). Credits: Anne Loggins/USFWS

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Other threats to bumblebees include competition with non-native bees, climate change, parasites and pathogens. Certain parasites have recently reached native bee populations through contact with commercially-produced bumblebees. These bumblebee colonies are shipped all over the world to support crops such as tomatoes and blueberries, which can only be pollinated by bumblebees' "buzz pollination" technique (see below).

What's the buzz? Bumblebees have the unique ability to "buzz pollinate" from which their name arises. They enter a flower and briefly vibrate their flight muscles, causing pollen to fall onto the bee. Buzz pollination is nearly 800 times more efficient than pollination by honey bees, and is the only way to pollinate certain plants, including tomatoes.

These threats all act together to drive bumblebee populations down, including several species such as the at-risk Franklin's bumblebee (see *Species Spotlight/pg. 15*) which is being considered for listing under the Endangered Species Act (ESA).

Fortunately, many conservation efforts are underway to improve the habitat and the health of bumblebees and similar pollinators. We are continuing surveys for rare and declining species, including Franklin's (*Bombus franklini*) and western bumblebees (*Bombus occidentalis*).

We also collaborate with USGS on research and bumblebee genetics projects, and support the work of bumblebee mapping projects (including the Oregon Bee Atlas and the Pacific Northwest Bumble Bee Atlas). The Yreka FWO also partners with Service offices in California and Oregon on these projects.



Through further research and action (see right inset) there is hope to recover these declining species and ensure they continue to serve as a crucial link between pollen and plants.

- Anne Loggins, Yreka FWO
fish and wildlife biologist

- Jeff Everett, Oregon FWO
fish and wildlife biologist

Above: Two species of bumblebee - yellow-faced (*Bombus vosnesenskii*) on left with yellow stripe on abdomen, and Franklin's on right - gather pollen from a lupine at Mt. Ashland, Oregon. Credit: Brendan White/USFWS

Want to help bee conservation?

- Build pollinator-friendly native plant gardens with nesting cover and flower resources all season long (see *Pollinator Partnerships/pg. 6*)
- Use alternative non-toxic pest management strategies
- Ensure purchased plants and seeds are neonicotinoid-free
- Become a citizen scientist and help with pollinator surveys to learn more about local bee populations: Bumblebee Watch - <https://www.bumblebeewatch.org/> Xerces Society - <https://xerces.org>
- Encourage others to learn about threats to pollinators and support native bee conservation

Conserving Monarchs on Rights-of-Way

The Service takes every opportunity to work with partners to conserve species and their habitats. Often, this is done before Endangered Species Act protections are needed. Many at-risk species are on the brink of extinction by the time they are listed. It's always better to resolve a problem before it becomes an emergency, so there are a number of tools and programs to promote at-risk species conservation.

Rights-of-way partners (transmission, transportation, and utility entities) across the lower 48 states recently came together to accomplish an unprecedented feat of establishing and maintaining habitat for the monarch butterfly.

With assistance from the University of Illinois at Chicago and the Service, the group created and agreed to administer the "Nationwide Candidate Conservation Agreement for Monarch Butterfly on Energy and Transportation Lands."

This agreement, the Monarch CCAA, is a voluntary agreement that includes

conservation measures, monitoring, and adaptive management practices that partners agree to implement.

Conservation measures include removing invasive species, planting and maintaining native plants, and retaining a minimum density of milkweed stems. These measures address the key threats facing monarchs on rights-of-way lands, primarily the loss of milkweed and other flowering nectar plants.

Partners use these conservation measures to create, enhance, and maintain monarch habitat on a portion of their lands across the country every year. In return, partners enrolled in the Monarch CCAA receive regulatory assurances granting authorization to incidentally take (*see right inset*) monarch butterflies if they are listed under the Endangered Species Act in the future. These assurances apply to replacing, maintaining, and enhancing existing infrastructure (e.g., pipelines, transmission lines, roadways), and do

not include major projects like new construction.

Utilities and departments of transportation who enroll in the Monarch CCAA provide benefits to monarchs and other pollinating insects. At the same time, these partners also avoid increased costs and operational delays as a result of a potential listing.

The ESA defines 'take' as: to harass, harm, pursue, wound, kill, trap, collect, or capture any threatened or endangered species. Harm may include habitat modification that actually kills or injures a listed species. Incidental is not intentional but not unexpected 'take'.

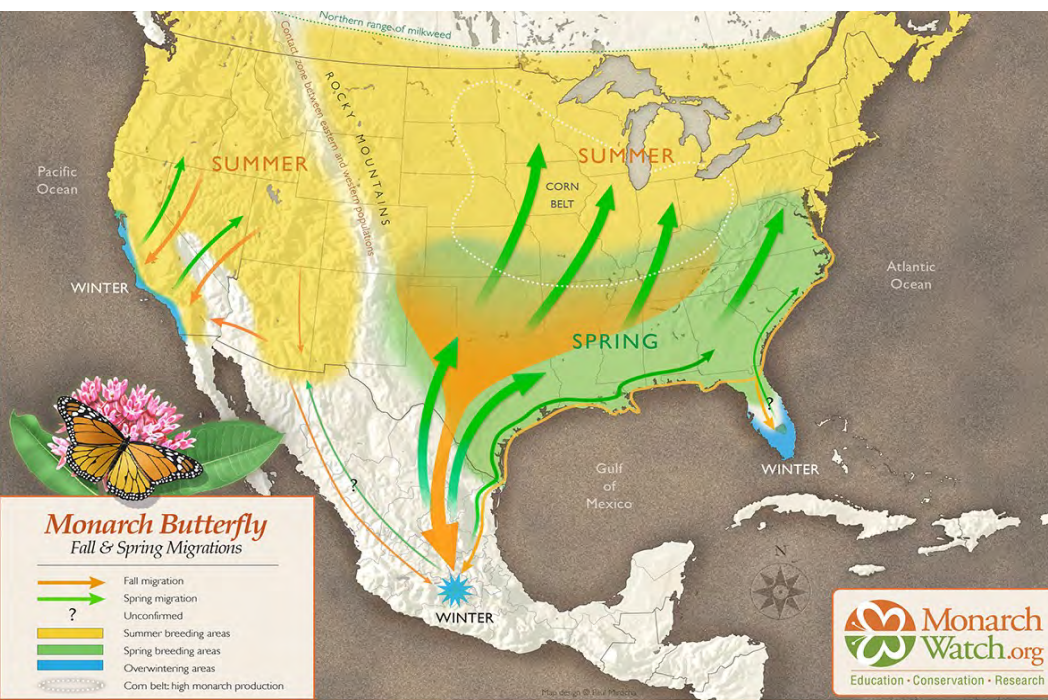
This agreement is a great example of working together to plan and accomplish early voluntary conservation.

We are currently considering a petition to list the monarch butterfly for protection under the federal Endangered Species Act and expect to make a decision by the end of this year.

- Laurel Hill,
Missouri Ecological
Services Field Office
fish and wildlife biologist

Above: A lone monarch searching for nectar before making its long journey south for the winter. Courtesy: Dave Burmeister

Left: Monarch butterfly migration map showing spring routes in green and fall routes in orange.



Helping the Magnificent Monarchs

Monarch butterflies travel thousands of miles over four generations from Mexico and southern California across the United States as far north as Canada to breed. The fourth generation of butterflies makes that journey all the way south to their overwintering grounds until the following spring when they begin the journey north. Impressive for an insect weighing less than a paper clip.

The life cycle of the monarch is equally impressive. Tiny caterpillars emerge from eggs, grow to almost 3,000 times their original size before forming a chrysalis, then transform through metamorphosis into magnificent adult butterflies.

The two populations of monarch butterflies, the western and eastern, have dramatically declined in recent years. The western - those that migrate to central and southern California - has declined 97 percent in the last 30 years, putting the population at risk of extinction. While 10 million monarchs used to spend the winter in coastal California in the 1980s, barely 30,000 individuals were counted last November.

Loss of habitat for breeding, migrating, and overwintering is one of the greatest threats to monarch butterflies. In addition, pesticides, a changing climate, disease, parasites, and predators are all factors in the decline of monarch populations.



One of the most effective ways to help conserve monarchs is to create habitat, by planting and protecting milkweed for caterpillars and flowers that provide nectar for adult butterflies (*see Partnerships for Pollinators/pg. 6*).

Raising monarch butterflies on a limited basis can also provide an opportunity for students to learn about, care for, and be amazed by these iconic insects (*see Monarchs in the Classroom/pg. 12*).

“Classroom rearing provides an up-close and personal experience for students to witness one of the many miracles of nature,” said Tom Landis, founding member of Southern Oregon Monarch Advocates, who has given

several Monarch and Milkweed workshops in the region.

While raising and releasing small numbers of monarchs can offer important and scientific educational opportunities, commercially produced and continuous mass-reared butterflies could potentially alter the genetic makeup of wild monarch populations and promote the spread of disease and pathogens.

For more information please visit the Xerces Society:

<https://xerces.org/monarchs/joint-statement-regarding-captive-breeding-and-releasing-monarchs>

- Jennifer Jones, Yreka FWO fish and wildlife biologist

Above: A monarch butterfly sips nectar on a milkweed plant.
Credit: Jim Hudgins/USFWS

Left: Service staff getting into a ‘pollinator state of mind’ last year in a native plant garden filled with showy milkweed and other nectar-producing plants to attract pollinators. These gardens also serve as outdoor learning classrooms for students and the public.
Credit: Laurel Hill/USFWS



Partnerships for Pollinators



An astonishing 85 percent of flowering plants require a pollinator such as an insect, bird, bat, or small mammal to reproduce. This includes two-thirds of the plants we cultivate as crops. Most pollinators are insects such as bees, beetles, wasps, flies, butterflies and moths.

Many pollinators have experienced population declines from habitat loss, competition from invasive species, and the broad use of insecticides. The Yreka FWO has been working to monitor pollinator populations and to restore, protect, and enhance pollinator habitat. None of these conservation efforts would be possible without robust community partnerships.

Yreka FWO staff monitor bumblebee populations in the Klamath-Siskiyou bio-region in cooperation with the Scott River Watershed Council, the U.S. Forest Service Youth Environmental Summer Studies program, and other Service offices. We partner with EcoTrust Forest Management to restore aspen and mountain meadow habitat for bumblebees and other pollinators in the Shackleford Creek Watershed through cattle exclusion and the removal of encroaching conifers.

Did you know that oak woodlands also support pollinators? Oak trees in California host at least 275 species of native insects, including pollinators like butterflies and moths. Their caterpillars are a critical food source for baby birds. Because oak woodlands are in decline, we are collaborating with the Klamath Siskiyou Oak Network to restore hundreds of acres of oak woodlands

throughout the Klamath- Siskiyou bio-region.

The Yreka FWO also restores pollinator habitats in more urban landscapes to help connect patches of high quality pollinator habitat. We have partnered with the Mid-Klamath Watershed Council to create monarch waystations at schools and on private lands. We have also collaborated with the Siskiyou Gardens, Parks and Greenways Association (SGPGA) to establish waystations along the Yreka Creek Greenway, at Greenhorn Park, and at the high school in Yreka.

We are developing a similar project with the Siskiyou Land Trust in the City of Mt. Shasta. These waystations provide nectar sources for pollinators throughout the growing season and native milkweeds for developing monarch caterpillars. They also provide a fun way for students to get outside and learn first-hand about pollinators. If you are interested in helping to conserve bees and butterflies, you can plant a pollinator garden in your own backyard or neighborhood.

In 2021, we will be teaming up with the Siskiyou County Beekeeper's Association (SCBA), the Yreka Garden Club and others to hold a pollinator garden contest. There are many great planting ideas and resources available online at monarchwatch.org/waystations.

Yreka FWO biologists are ready to answer questions emailed to: yreka@fws.gov.

So, get your gloves and spades ready, prep your garden, and stay tuned for more details.

- Becca Reeves and Sheri Hagwood, Yreka FWO fish and wildlife biologists

Top: A young volunteer helps survey for pollinators. Field surveys are critical for providing native insect population estimates. Credit: Jeff Everett/USFWS

Below: Volunteers plant a pollinator waystation in Yreka last year. Credit: Sheri Hagwood/USFWS



Directorate Fellowship Program: Studying At-Risk Bumblebees from Afar



locate and create maps of these sites (*see map/pg. 8*). Much of this habitat is located at high elevations in remote wilderness areas that likely have never been surveyed for bumblebees. These habitat maps will help streamline future bumblebee surveys, ensuring the best chance of finding rare species.

The DFPs also compiled information on management recommendations for endangered and at-risk bumblebee species to assist with future conservation actions.

“I enjoyed learning about bumblebee ecology, the threats to bumblebees, and conservation practices to help them,” said Hansum. “Understanding endangered species management and policy is very important and can be applied to other species and other areas of conservation.”

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Left: A Franklin’s bumblebee collects pollen. Courtesy: J.P. Strange/USDA

Below: Chloe Hansum, one of two Directorate Fellowship Program interns who worked for the Yreka and Oregon FWOs last summer. Chloe is a senior at Dordt University in Iowa, majoring in biology. Courtesy: Chloe Hansum



This summer the Yreka FWO and the Oregon FWO welcomed Claire Yager and Chloe Hansum to study at-risk bumblebees and their habitat under the Directorate Fellowship Program (DFP). The nationwide program provides opportunities for college and graduate students to work with Service offices and refuges on focused projects over an eleven-week term. DFP participants contribute valuable work toward accomplishing Service goals, while also networking and learning about career opportunities.

The FWOs developed a project for the DFPs that focused on surveying high elevation meadows for Franklin’s bumblebee (*see Species Spotlight/pg. 14*). Later, in response to the COVID-19 pandemic, the project was modified from field work into telework-ready tasks designed to contribute

important information to future surveys and bumblebee conservation.

“Claire and Chloe were enthusiastic from the start, and amazingly resilient as the program shifted from field work to exclusively telework,” said Jeff Everett, Oregon FWO fish and wildlife biologist. “They jumped right in and cranked out a ton of work. We were lucky to have them both on board.”

The project’s primary goal was to identify high quality habitat in the Klamath region that might support Franklin’s bumblebee, primarily high-elevation meadows adjacent to wetlands. This information is not readily available, even within existing vegetation classification models. The DFPs used GIS mapping technology, aerial imagery, and a discerning eye to

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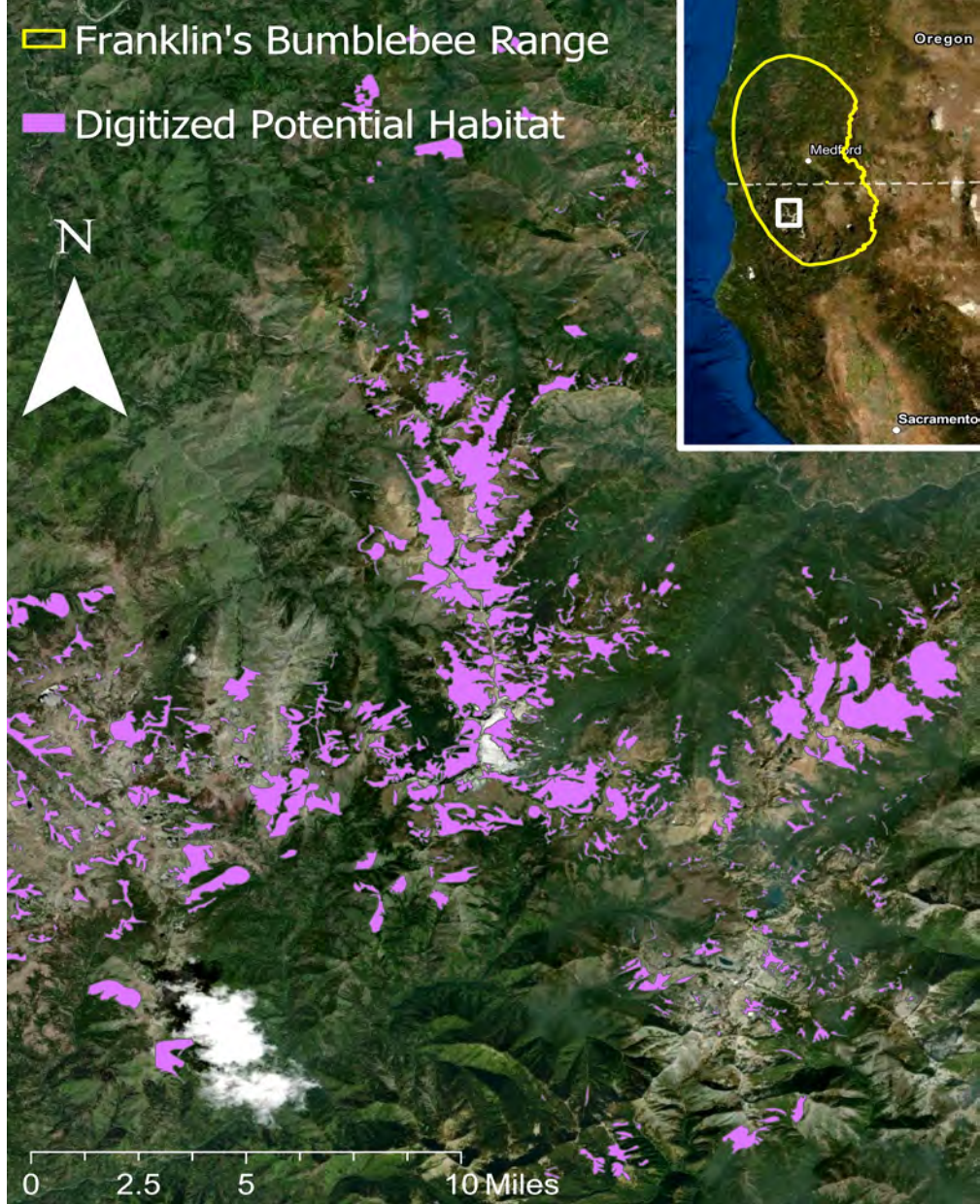
They also completed a field guide for high elevation wildflowers within the range of Franklin's bumblebee (see *Pollinator Plants/pg. 9*). This guide will facilitate quick identification of key bumblebee flower resources in the field.

Finally, the DFPs had the opportunity to network with others in the program, Service employees, and pollinator-focused biologists across the country, learning about pollinator conservation tools and Endangered Species Act policy. They also had weekly meetings with a career coach.

"I was excited to work alongside people who are just as passionate about conservation and wildlife as I am, and who can enact real change in how these things are managed," said Yager.

The Yreka FWO is grateful to Claire and Chloe for their hard work this summer contributing to bumblebee conservation. We hope to hire new DFP interns next year to continue this work by surveying for rare bumblebees.

- Anne Loggins, Yreka FWO
fish and wildlife biologist



Above: Digitized map of bumblebee habitat in the north Marble Mountains, Siskiyou County. This is a portion of the full map created by DFP interns covering the entire range (inset) of Franklin's bumblebee. Credit: USFWS

Left: Claire Yager, one of the Directorate Fellowship Program interns this summer. Claire is a senior at Montana State University, majoring in organismal biology. Courtesy: Claire Yager.

Below: Lupines and rabbitbrush bloom on mountain slopes, where Franklin's bumblebee, a rare species, may one day be observed again. Credit: Anne Loggins/USFWS



Pollinator Plants in Mountain Meadows



Some of us are lucky enough to spend time where many species of native bumblebees live: high elevation mountain (montane) meadows. High elevations offer a bird's-eye view of the world where snow-covered volcanoes are awe-inspiring in every language. And, don't forget the summer flowers, oh the flowers!

Plant and animal species are continually interacting in montane meadows. The predator eats prey, parasites live off others, and fungi help plants obtain nutrients. And the beautiful flowers provide important resources that pollinators eat and drink. These resources include sweet nectar and nutritious pollen. It's a symbiotic (mutually beneficial) relationship where insects get to eat and the plant gains wings which it uses to distribute pollen.

In these montane meadows, two of the best floral resources for rare pollinators are the tall phacelia (*Phacelia procera*) and horsemint aka nettle leaf giant hyssop (*Agastache urticifolia*). Both are perennial plants that return each year after the snow melts.

Tall phacelia is so named because it can grow up to six feet. Some species of *Phacelia* are called fiddlenecks because their flowers are arranged much like a fern's coiled fiddlehead. There are over 200 species of phacelia which are very important for native pollinators.

Horsemint leaves and stems look like stinging nettle, so much so that the species name *urticifolia* means stinging nettle leaf (*Urtica* is the genus of stinging nettle). But horsemint doesn't hurt to touch. Instead it has a dense head of aromatic flowers much like its relatives in the mint family, including basil, lavender, and thyme, which bees love.

Horsemint is common, widespread, and a foundational bee plant in the western United States, providing floral resources for a wide array of pollinators.

One of the many things the Yreka FWO Directorate Fellowship Program interns (see *Studying At-risk Bees from Afar/pg. 7*) worked on this summer was a floral resources guide

for montane meadows in southwestern Oregon and northwestern California. This guide identifies a few of the plants that are especially important to rare native bees. If the plants can be found, it is more likely the bees will be there too.

- Gina Glenne, Yreka FWO
deputy field supervisor



Top: A lush high-elevation meadow in summer is filled with a variety of beneficial native flowering plants. Credit: Jenny Ericson/USFWS

Above: One of the most beneficial native plants for rare pollinators in mountain meadows is tall phacelia. Credit: Sheri Hagwood/USFWS

Left: Each spring, native wildflowers such as horsemint attract pollinators like this yellow-faced bumblebee to the abundant nectar and pollen. Credit: Anne Loggins/USFWS

Karuk *Ihuk* Flower Dance: From Girl to Woman in the Community



Left: Dakota Carlson at her flower dance in Panamniik (modern day Orleans, California). The Flower Dance is a young girl's passage into womanhood. This tradition has been passed down for generations. Courtesy: Mary Jane Risling

Below right: Tall larkspur (Delphinium glaucum) flowers attract native pollinators like this white-shouldered bumblebee to its pollen and nectar. Credit: Anne Loggins/USFWS



Seasonal timing and pollination is vital to a healthy environment, where bumblebees, butterflies, beetles and hummingbirds are important to blossoming flowers, shrubs and trees. Like a blossoming flower in nature, a young woman within the Karuk tribal community undergoes a coming of age ceremony, based on the concept of community pollination.

The *Ihuk* Flower Dance is usually held in the summer at a traditional village site along the Klamath River in Siskiyou County, California to honor and bless a young woman as she becomes an adult. During the ceremony, the young woman becomes a Flower Girl, with her family and community as the symbolic pollinators. Knowing that a young woman is made wiser and stronger

through this ritual, the Karuk have been conducting the ceremony since time immemorial. This instills traditional and cultural practices so these girls can grow to live their adult lives in a good way.

With the settlement and integration of European influence on tribal communities in the Klamath Basin, many important traditional ceremonies were banned and not performed for many years. But they were never forgotten.

Since the mid-1990s, the three to five day *Ihuk* ceremony has been revitalized for young women and the river communities as a whole. The ceremony brings family and community members together to sing and pray for the young woman's ability to prosper throughout her life.

The *Ihuk* ceremony occurs after a girl has had her first menstruation. During the *Ihuk*, the Flower Girl works with a medicine woman to accomplish certain tasks during the day that teach life lessons or involve tribal culture like learning the Karuk language.

At night, many songs of prayer are sung by close relatives and life teachers. Finally, when all tasks are fulfilled, the Flower Girl is presented to the community as a woman ready for adulthood.

By learning many traditional and contemporary lessons throughout the ceremony, the Flower Girl is empowered to nurture, care, and strengthen coming generations. Knowing these women may grow to be mothers to their children, wives to their husbands, and grandmothers to many, a strong woman will further build up the community through her leadership.

The ceremony teaches the Karuk to be aware of how a young woman is prepared for the future and it also makes her aware of how she carries herself in life. Understanding the practices within the *Ihuk* ceremony ensures the strongest most vibrant blossoming flower – a young Karuk woman.

*- Trevor Super, Yreka FWO
Native American
program specialist*



We are Yreka FWO: Meet Nadine Kanim

Each newsletter, we introduce a member of the Yreka FWO team. This issue, we feature Nadine Kanim, senior fish and wildlife biologist.

Kanim was raised in Canada, in a home her parents built in the forest. She spent many days exploring the woods with her four siblings, and credits her mother for being a great influence, instilling an appreciation of nature.

In the 1970s, Kanim's parents took the family on a journey through Europe, Greece and Turkey, eventually settling in her father's home country of Lebanon. As the year progressed, so did the civil war in Beirut, so the family relocated to the United States, settling in California with relatives.

"Starting high school in Los Angeles after growing up in the woods of Quebec was a huge culture shock," Kanim said. "So I really enjoyed working summers in the eastern Sierra doing fish work in mountain streams."

Phil Pister, a fish biologist for the state of California and Executive Director of the Desert Fishes Council, soon became one of Kanim's mentors, introducing her to native fish conservation for species such as golden trout, and Owens and Devils Hole pupfishes.

"I remember transporting buckets of pupfish to various protected sites in case populations in their native waters were severely impacted," said Kanim. "Phil was so influential, showing me how to work with others to protect species on the verge of extinction."

Educated at the University of California, Los Angeles and the University of Nevada, Las Vegas,

Kanim joined the Service in 1988 while her husband finished his Ph.D. at University of California, Davis.

"I was hired to do recovery planning for endangered species like the San Joaquin kit fox, giant kangaroo rat, and blunt-nosed leopard lizard," said Kanim. "When the fish biologist retired, I was hired into that job and worked on Delta smelt and Klamath Basin endangered suckers."

In 1994, Kanim moved with her husband and daughter to southern Oregon where she was hired for a part-time position at the Yreka Fisheries Office (now the present-day Yreka FWO) as the spotted owl biologist.

Since then, Kanim has worked on recovery and listing efforts for several species typically not considered charismatic – invertebrates, amphibians and plants. One of those holds a special place for her: Yreka phlox (*Phlox hirsuta*). Kanim says that working on the Yreka phlox recovery plan has been a career highlight.

"This little plant is only found in five places in the world, and they're all within Siskiyou County," said Kanim. "It's been a joy working with all the partners to develop and implement conservation measures to recover the Yreka phlox."



Thirty-two years of working for the Service has provided Kanim plenty of experience to share with others just starting their natural resource careers. Her advice: remain persistent and get as much education as possible.

"A strong scientific background provides credibility and authority to advocate for the recovery of imperiled species," Kanim said. "Our own education is the most powerful tool we have to support the continued existence of species facing external threats to their survival."

- Susan Sawyer, Klamath Basin public affairs officer

Above: In her off-hours, Nadine Kanim enjoys hiking, learning to play piano, fly fishing, studying botany, and exploring new interests. Credit: USFWS

Left: Kanim, pictured in 2017 on the China Hill 'Phlox Walk', has worked at the Yreka FWO for twenty six years. In 2008, Kanim was recognized as a Service Recovery Champion for her dedicated work on the Yreka phlox recovery efforts. Credit: Emma Rose Parker

Monarchs in the Classroom

In the summer of 2019, residents from Brookings, Oregon discovered a female monarch laying hundreds of eggs on milkweed plants in neighborhood yards. Most of these gardens did not have enough milkweed to support the growing caterpillars. Concerned citizens collected and delivered the eggs and caterpillars to monarch citizen scientists in Oregon and northern California to raise, tag and release as adult butterflies into the wild.

Receiving some of the eggs and caterpillars were 11 teachers from four schools in Siskiyou County, California and Jackson County, Oregon. Over 200 students helped raise and release these monarchs. Teachers expressed the value of raising monarchs in the classroom because it allowed students real-world experiences for hands-on learning.

“It was an honor to be part of this project to help these monarchs survive,” said Alisonleigh Asher, preschool teacher at the Children’s World Montessori in Ashland, Oregon.

“How do they know how to make themselves into a butterfly if they just turn into liquid inside the cocoon?”

- Luna, age 5

“Those guys have a long way to go without even a jacket in the coldness of wind in the sky!”

- Zadrion, age 3

“In addition to learning about monarchs, the students learned how to have gentle hands with these majestic creatures,” said Asher.

As part of the effort, the Yreka FWO was invited to teach students about monarchs, including their life history, threats to the species and conservation efforts.

The Yreka FWO helped students tag the adult butterflies and submit data to the regional database to monitor migration patterns as part of the Monarch Tagging Program at Washington State University.

Along with creating habitat (*see Helping Monarchs/pg. 5*) the Service also recommends reducing pesticide use, participating in citizen science efforts to monitor monarchs and encouraging others to take steps to protect this iconic species.

- Jennifer Jones, Yreka FWO fish and wildlife biologist



Above: Students at schools in northern California and southern Oregon received monarch butterfly eggs and caterpillars to raise in classrooms last year.

Below: In 2019, the Yreka FWO helped students tag and release adult butterflies as part of a long-term monitoring project tracking monarchs during their winter migration.

Photo credits: Jennifer Jones/USFWS



Butterfly Monitoring

Straddling the Oregon-California border, the Cascade-Siskiyou region is a biodiversity hotspot where the Klamath, Siskiyou, and Cascade mountain ranges come together to form unique plant communities and species assemblages. This area is nationally renowned for its butterfly diversity and is home to over 120 species, including some that are rare or at-risk. Despite this diversity, little is known about the current distributions and conservation status of many butterfly species across the area.

In 2019, the Xerces Society partnered with the Cascade-Siskiyou National Monument to launch a long-term monitoring program called the Cascade-Siskiyou Butterfly Monitoring Network. The Xerces Society is a non-profit environmental organization that works to conserve invertebrates that are important to biological diversity and ecosystem health.

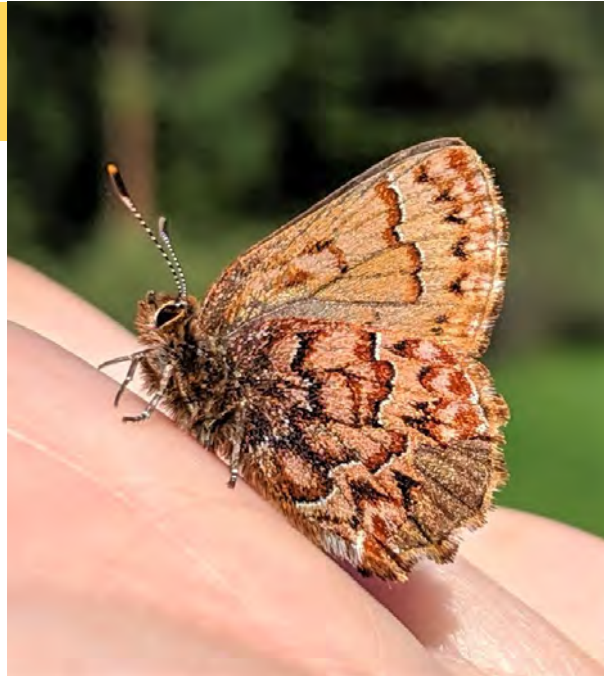
With the help of other local scientists and volunteers, Xerces and the Monument established 17 long-term permanent monitoring transects. As

part of this collaborative effort, biologists from the Yreka FWO help survey one of these transects twice a month from April through September. As surveyors, we slowly walk the transect, recording all butterflies seen within five meters. For butterflies that are hard to identify, we briefly catch them to confirm their identification.

According to Charles Schelz, Ecologist with the Cascade-Siskiyou National Monument, this is the first comprehensive butterfly monitoring program to catalog the diversity and abundance of butterflies in this area.

“This program brings together researchers, land managers, and community scientists to collect data that will inform local conservation efforts,” said Schelz. “This will help program managers evaluate long-term population trends and map out regional butterfly distributions.”

- Jennifer Jones, Yreka FWO
fish and wildlife biologist



Above: Surveys for butterflies such as this western pine elfin (Callophrys eryphon) are done each year in the Cascade-Siskiyou National Monument in Oregon.

Below: Biologists and volunteers play an important role in these surveys which are critical to monitor and catalog the diversity and abundance of butterflies in the area. Image credits: Candace Fallon/Xerces Society



Species Spotlight: Franklin's Bumblebee



Franklin's bumblebee (*Bombus franklini*) is a large bee with a small range, found in an area roughly 13,300 square miles in southern Oregon and northern California. This limited range gives it the dubious distinction of having the narrowest known distribution of any bumblebee in the world.

Found between the Pacific Coast and the Sierra-Cascade mountains, Franklin's bumblebee occurs at elevations between 540 feet and 7,800 feet. This bumblebee is distinguished from others by its solid black abdomen with two white spots at the tip, and an upside down U-shaped yellow patch on its upper back, or thorax. The hairs on the round face are mostly black with yellow hairs on top of the head.

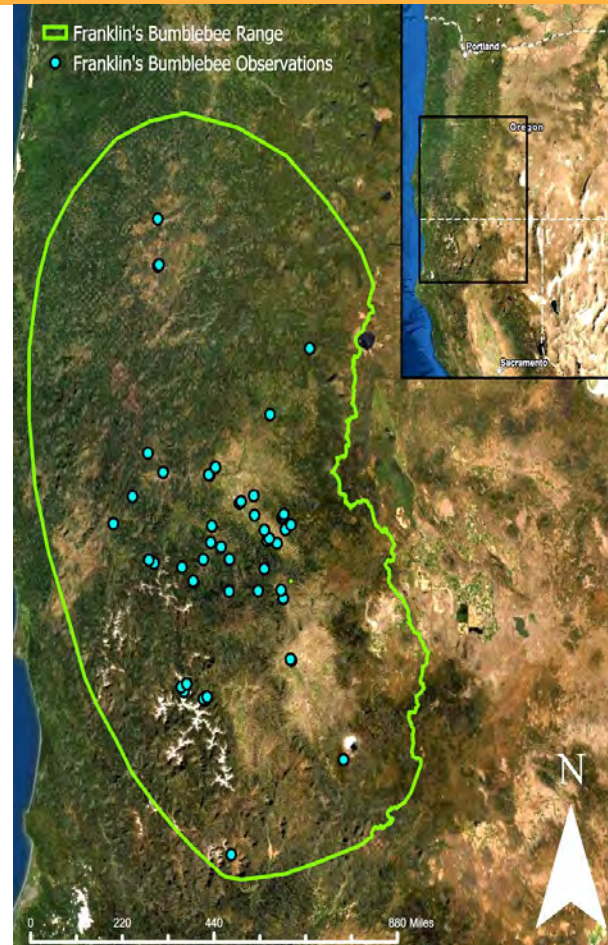
Franklin's bumblebee is classified as a 'generalist forager', meaning it isn't picky and collects pollen from many species of wildflowers such as lupine, California poppy, tall phacelia and horsemint. Since it nests in

abandoned rodent borrows or clumps of grass, colonies may be limited by the abundance of rodents and the presence of undisturbed grassland. Populations of this bumblebee have declined drastically since 1998. The last sighting of a single worker bee occurred in 2006 at Mt. Ashland in Oregon.

The increasing rarity and limited distribution of Franklin's bumblebee adds to the fragility of the species, making its decline even more alarming. Primary threats to Franklin's bumblebee are the interaction of disease and pesticides on an originally small population with inherently low genetic diversity.

Due to its limited range, population decline, and threats to its survival, in 2019 this bumblebee was proposed for listing as endangered under the federal Endangered Species Act with a final decision anticipated later this year.

Protecting native bees ensures our native plants, gardens, and crops will



have plenty of pollinators in the years to come.

The Yreka FWO will continue to work closely with the Bureau of Land Management, the U.S. Forest Service, and scientific experts to survey for this elusive bee in hopes they are found still buzzing around.

- Susan Sawyer, Klamath Basin public affairs officer



Top: Franklin's bumblebee on a California poppy. Experts hold out hope that this rare species will be found in the wild again. Courtesy: Pete Schroeder

Above: Franklin's bumblebee range is limited to an area approximately the size of Maryland. Credit: USFWS

Left: Dr. Robbin Thorp (1933-2019), top bee expert, on a native bee survey in 2017. Thorp was the last person to observe a single Franklin's bumblebee in 2006. Courtesy: Rich Hatfield

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*Cover: A western bumblebee, *Bombus occidentalis*. Courtesy: Sam Droege/USGS. Learn more about his super-closeup photography at: <https://mymodernmet.com/sam-droege-macro-bee-portraits/>*

Back: A monarch butterfly drinks nectar from a pineapple sage after being tagged and released. Credit: Jennifer Jones/USFWS



Note on COVID-19: The health and safety of our staff is our top priority. In an effort to slow the spread of the coronavirus, the Yreka Fish and Wildlife Office is operating remotely. At this time, we are responding to requests for information via email or phone. We appreciate your understanding. All group photos in this issue were taken prior to COVID-19 restrictions.