

POISONED

10 American species imperiled by pesticides



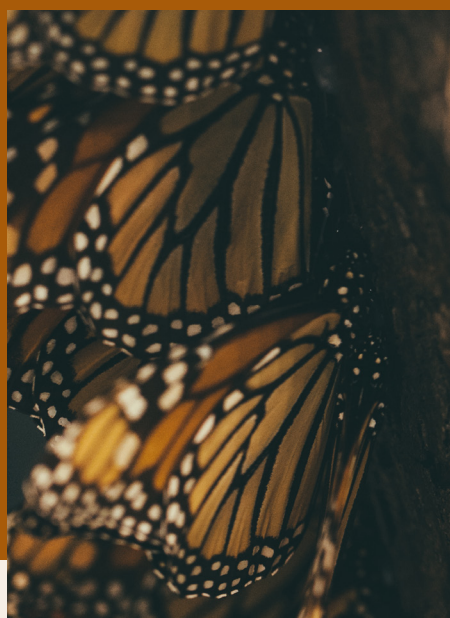
2019
Top 10 Report

POISONED BY PESTICIDES

CONTENTS

Salado salamander	3
Streaked horned lark	5
Chinook salmon	7
Crotch's bumble bee	9
California red-legged frog	11
San Joaquin kit fox	13
Northern spotted owl	15
Indiana bat	17
Pink mucket pearly mussel	19
Monarch butterfly	21
Staff Choice	Back Cover

endangered.org/takeaction



Cover: Monarch butterfly (*Danaus plexippus*). MmeEmil/iStockPhoto

Acknowledgments

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Introduction

ANY ADMINISTRATION HAS THE POWER TO GET US BACK ON TRACK
AND AWAY FROM PESTICIDES.

Our world is awash in chemicals. We're particularly addicted to pesticides—the insecticides, herbicides, and rodenticides that we spray on acres and acres of crops, commercial and industrial developments, and our own homes and lawns. The most recent report from the Environmental Protection Agency shows that, in the United States, we used nearly \$9 billion worth of pesticides in 2012 alone. And the U.S. Department of Agriculture estimates that pesticides may contaminate the drinking water of up to 50 million people. If we're poisoning ourselves, we shouldn't be surprised that these chemicals turn up in other species, too—from a pearly mussel in Tennessee to an orca swimming off Seattle.

Pesticides can exact a high price. Lasting for days, months, or even years and traveling many miles in wind and water, they have impacts far beyond their intended targets. They kill indiscriminately, and endangered species are among their victims. The U.S. Fish and Wildlife Service estimates that nearly 1,200 plants and animals are imperiled by pesticides.

And climate change is a driving force that we can't deny. Warming temperatures encourage

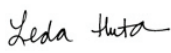
weeds and pests to flourish, which then prompts higher pesticide use. And these toxic chemicals, themselves, push climate change. Nitrous oxide, a component of many pesticides, has a greenhouse gas potential nearly 300 times higher than that of carbon dioxide.

The Trump Administration actively denies the reality of climate change and has dramatically changed how the Endangered Species Act is implemented, leaving vulnerable species at far greater risk. Administration officials, including the current Secretary of Interior, David Bernhardt, held closed-door meetings with agrochemical industry leaders and then reversed agency scientists' work to protect us and our natural world from pesticides, even those that can cause brain damage—*brain damage*—in children.

Yes, our world—and the world we're creating for many at-risk species—is awash in chemicals. But there's good news: We can tackle this problem. Past administrations supported record growth in organic farming. More recently, we've taken some wrong turns. But any administration has the power to get us back on track and away from pesticides.



Michael J. Parr
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Earthjustice



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Xerces



WARNING
Glyphosate & Atrazine
Can kill salamanders

POPULATION: Unknown

STATUS: Threatened

RANGE: Estimated to be a few springs near Salado (Bell County), TX

HABITAT: Clear, cool freshwater springs

Salado Salamander

Eurycea chisholmensis

We know little about the Salado salamander, which was first described as a new species in 2000. We have no information about its historic range or population, or how many exist today. We don't know where they breed, where they deposit eggs, or how big their clutches are. We can guess at their adult size—a few inches—but that's only a guess. We don't know anything about feeding territory or if it has predators. We don't think it hibernates or migrates, but we really don't know for sure. We can't say if it hosts parasites or if it's vulnerable to diseases. This lungless salamander breathes with feathery gills and lives its entire life underwater. We don't know a whole lot more than that.

And for all we don't know about this salamander, we do know that it depends on high-quality, clean water for survival.



Pete Diaz, USFWS

What we do know is that this salamander is rare. Very rare. A researcher collected a few around 1990. None were even seen from 1991 through 1997, though more than 20 searches were launched. One was found in 1998. Only about a hundred have been identified in the past five years. As far as we know, this salamander lives in only a few feeder springs in Bell County, Texas. And in those springs, it's rare. Rare enough that the U.S. Fish and Wildlife Service purchased 256 acres around these springs to protect them.

But the Salado salamander is at risk for reasons beyond its tiny population. Its habitat is fragile and vulnerable to fluctuations brought on by climate change. Invasive species or disease could do it in entirely. And for all we don't know about this salamander, we do know that **it depends on high-quality, clean water for survival.** Runoff full of Roundup®—glyphosate—might kill it. And like some amphibians, it may be vulnerable to atrazine—the second most widely used herbicide in this country—which can cause deformities, stunt growth, and alter sexual development.

Even **extremely low levels of atrazine may have deadly consequences** for salamanders over time. Most studies used to determine pesticide safety run for just a few days. But in longer studies, scientists have found that salamanders that survive an initial exposure to atrazine are significantly more likely to die within 16 months. A slower death, perhaps, but death, nonetheless.



POISON

Neonicotinoid pesticides

Keep out of reach of larks

POPULATION: Fewer than 2,000

STATUS: Threatened

RANGE: Pacific Northwest

HABITAT: Flat, open, treeless spaces with sparse vegetation



Streaked Horned Lark

Eremophila alpestris strigata

A rare subspecies of the widespread horned lark, this small, ground-nesting bird, with its walnut-brown back, dark horns, and bright yellow breast and eyebrow stripes, was historically found throughout the Pacific Northwest, from southwestern British Columbia to southwestern Oregon. It has vanished from most of that range, and now occurs only along the southern coast of Washington, the lower Columbia River, the southern Puget lowlands of Washington, and Oregon's Willamette Valley. **Fewer than 2,000 streaked horned larks remain.** This lark was listed as threatened under the Endangered Species Act in 2013.

Just a few seeds treated with neonicotinoid pesticides—those neurotoxic chemicals that appear to be destroying bee colonies around the world—can kill a bird.

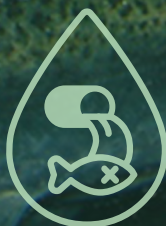


Roderick Gilbert

These larks need wide open spaces—relatively flat, treeless land with few shrubs. They nest on prairies and agricultural grasslands, in low dunes and on sandy beaches, on deposition spoils islands, on mudflats, and in sparsely-vegetated patches alongside airport runways. The female builds a nest on the ground, sometimes even in gravel and dirt along roads, and lays a clutch of three to four eggs. Incubation is brief—just 11 days—and the young leave the nest in about 10 days. This lark's winter habitat is largely similar: landscapes that are broad, open, sparsely vegetated, and treeless.

This beautiful bird faces many threats. Land throughout its range has been developed for agriculture and industry, and many formerly open nesting habitats are now crowded with trees and underbrush. Invasive nonnative beach grass, and poor management of that grass, has further reduced nesting areas. This lark is vulnerable to inbreeding, in part because the population is so low, and this suppresses viability and survival.

Pesticides may also play a role. In 2014, four dead streaked horned larks were collected at the airport in Corvallis, Oregon. **The gizzard of one tested positive for zinc phosphide,** a common pesticide frequently used by farmers, and also used by airports to control rodent populations and reduce raptor-airplane collision hazards. And these larks eat seeds which could potentially be contaminated with pesticides. Just a few seeds treated with neonicotinoid pesticides—those neurotoxic chemicals that appear to be destroying bee colonies around the world—can kill a bird. For this lark, those few seeds could mean forever.



WARNING
Pesticides
Salmon tainted with toxins

POPULATION: A fraction of historic population

STATUS: Some threatened, some endangered

RANGE: Pacific Northwest and California

HABITAT: Clear, cool streams, migratory river corridors,
estuaries, and the ocean

Chinook Salmon

Oncorhynchus tshawytscha

Chinook salmon, the largest salmon, have sustained Native American tribes since time immemorial and supported thriving fishing communities throughout the Pacific Northwest and California. Born in cold, freshwater streams, these salmon migrate to the ocean, where they mature to adulthood and live for several years. For their final chapter, **the Chinook journey hundreds of miles upstream**—to the very waters where they were born—and then they breed and die. Their carcasses feed bears, eagles, and other wildlife and deposit rich marine nutrients in forests that shade and protect streams and rivers.

Toxic chemicals impair the Chinook's ability to swim and evade predators, and contaminate this salmon's fatty tissues.



NOAA

Chinook salmon have declined due to human activities, including overfishing, development, and agriculture. Our dams block their migration and outright kill them. And they are impacted by pesticides, which enter salmon streams in **contaminated runoff**. These toxic chemicals kill salmon prey and aquatic plants that provide cover and shelter. They impair salmon's ability to swim and evade predators. And they deposit in the fatty tissues of the Chinook.

As the fattiest salmon, **the Chinook are critical to the survival of endangered Southern Resident orca whales**. These orcas swim in the Salish Sea—interconnected waters including Puget Sound, the Strait of Juan de Fuca, and Strait of Georgia—and in coastal ocean waters off the Pacific Northwest. They are fish-eating mammals that rely on salmon for survival, and they greatly prefer the fat-rich Chinook. Indeed, about 80 percent of their diet is comprised of these salmon, and they need 300 to 350 pounds of them every single day to avoid starvation.

But thanks to those migration-blocking and salmon-killing dams, the orcas' primary food supply is disappearing. And the Chinook they do consume are likely tainted with toxins that then deposit in the orca's own fatty reserves. This orca population has plummeted due to recent deaths from starvation, reproductive failures, and calf mortalities. Fewer than 75 remain. A tangled web of challenges—including the toxic impact of pesticides—**is pushing each of these species closer to extinction**.





DANGER
Neonicotinoids
Highly toxic to bees

POPULATION: Unknown

STATUS: Endangered (IUCN Red List); candidate for state listing under the California Endangered Species Act

RANGE: California

HABITAT: Warm and relatively dry scrub and open grassland



Crotch's Bumble Bee

Bombus crotchii

Like most bumble bees, Crotch's bumble bees are social. Colonies are annual; they start each spring with a queen and develop through the season, adding workers (females) and reproductives (males and new queens). At the end of the year, the old queens die, and the newly mated queens overwinter. The following spring, these queens emerge to forage and search for new nesting sites. Crotch's bumbles typically make their homes underground.

Bumble bees are highly susceptible to pesticide exposure all year long, while they are foraging at flowers and as they nest and overwinter underground.



Zach Abbey / Zabbeyphotography.com

Like many bumble bees, Crotch's bumble bee buzz pollinates, grabbing a flower and vibrating its body to shake out the pollen. This specialized shimmy is a boon to agriculture and our taste buds, too—many plants that are buzz-pollinated (like tomatoes and blueberries) make better fruit. **Crotch's bumbles especially like milkweed**, an essential food plant for the caterpillars of monarch butterflies. Thus, Crotch's bumble bees play an important role in maintaining the plant populations that monarchs need to survive.

Pesticides—especially insecticides—put many bees at risk, and this bee is no exception; it suffers from the millions of pounds of insecticides that are applied to California's farmlands and backyards each year. Bumble bees are **highly susceptible to pesticide exposure all year long**, while they are foraging at flowers and as they nest and overwinter underground. Neonicotinoids, a type of commonly-used insecticide, are particularly harmful. These chemicals are highly toxic, persist long after application, and can harm bumble bees—and other beneficial insects like butterflies, honey bees, and beetles—even months after they've been applied.

Crotch's bumble bees have disappeared from most of their historic range in California and Baja, Mexico, and their relative abundance—how many of them exist, relative to other bumble bees in their range—**has dropped by 76 percent**. Planting bee-friendly flowers (like milkweed, lupine, and phacelia) and not using insecticides—and supporting farming practices that minimize or eliminate their use—are the best things that you can do to help.



CAUTION

Atrazine

Can cause deformities in frogs

POPULATION: Unknown

STATUS: Threatened

RANGE: Central California south to northern Baja
(California and Mexico)

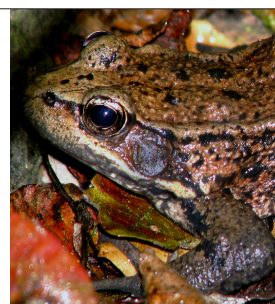
HABITAT: Cool upland sites with rocky or vegetative
shelter combined with sheltered aquatic breeding sites

California Red-legged Frog

Rana draytonii

This frog is big. Up to 5" from snout tip to vent, and that's not even counting those long legs. Big. California red-legged frogs, the state's amphibian, are the largest native frogs in the western United States. They were once abundant; pre-1900 settlers caught some 80,000 each year for their legs. While the species' current headcount isn't known, their numbers appear to be **greatly reduced across more than half of their former range**. Widespread loss of wetland habitats and ongoing pollution have limited their population growth and recovery.

If the toxins they absorb through their skin don't outright kill them, they can inhibit a frog's growth and development, change its behavior, and impact reproduction.



Dave Feliz, CDFW

California red-legged frogs play vital roles in the food web of their ecosystem. As tadpoles, they help clean up algae. On dry land, they devour insects, spiders, snails, and even mice. They are eaten, in turn, by mammals, birds, and snakes. And they're an indicator species: Their own well-being is a marker for the condition of their ecosystem. When their home becomes unhealthy, so do they.

Human activities—timber harvesting, agriculture, development, and introduction of nonnative plants and predators—are damaging this frog's habitat. And pesticides—insecticides, fungicides, and herbicides—pose a dire threat. Frogs have permeable skin, which leaves them **especially vulnerable to chemical exposure**. If the toxins they absorb through their skin don't outright kill them, they can inhibit a frog's growth and development, change its behavior, and impact reproduction.

At least 66 known pesticides are present in the California red-legged frog's environment, and traces of these chemicals found where the frogs live correlate to reduced populations in those areas. One herbicide present in their habitat is atrazine, which is heavily used in agricultural, commercial, and residential settings in the United States, second only to glyphosate (Roundup®). Atrazine has been shown to alter neurotransmitters and is a known hormone disruptor that can stunt growth, cause deformities, and lead to abnormal sexual development. Until 2016, the EPA maintained that atrazine was safe; the agency has been debating that stance since then. **Europe banned it, entirely, in 2004.**



DANGER

Insecticides & Rodenticides
Poison foxes through their food

POPULATION: Unknown

STATUS: Endangered

RANGE: Limited range primarily in California's
San Joaquin Valley

HABITAT: Arid scrub and grasslands



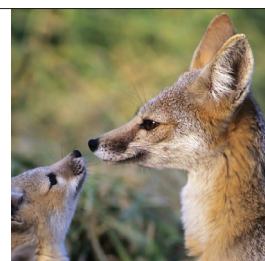
San Joaquin Kit Fox

Vulpus macrotis mutica

Those cute ears? Irresistible. And they're functional, too, sort of like high-definition directional antennas for sound signals. They also lower body temperature, which is important in this fox's hot habitat.

The San Joaquin kit fox is a member of the Canidae family, along with dogs and wolves. With proportionally long legs and a lithe body, it's the smallest fox in North America, weighing in at about five to six pounds. The kit fox's coat is yellowish to gray with dusky brown patches, a pale belly, and distinct, dark muzzle markings. These foxes hunt in the cool of the night, seeking out small prey—rodents and rabbits, voles, snakes, lizards, and fish. Insects and carrion. In a pinch, even tomatoes. And they are hunted, in turn, by large hawks and owls, coyotes, and bobcats. They typically form monogamous mating pairs each breeding season. Litters range in size from a pup or two to six or seven. **Mortality in the first year is high**, perhaps as high as 60 to 70 percent. A kit fox that makes it to adulthood may live for five or six years.

Too many bites of tainted insects, birds, and mammals, and the San Joaquin kit fox could be gone forever.



USFWS

The San Joaquin kit fox is an umbrella species: **When it is protected, many other species within the ecosystem are protected, too.** As urban and agricultural development threatened its habitat, this fox's population declined, and federal protections for remaining members were in place by 1967. California granted state protections in 1971, as well.

Our need to expand has squeezed this fox's habitat and riddled its home with hazards. Those chemicals we use to eliminate mosquitoes and gnats and mice and rats? They can end up on the kit fox's dinner plate. A tenth of all kit foxes die from being exposed, through their food, to insecticides, such as diazinon. And rodenticides are especially deadly. They are stored in tissue and **can be potent long after the target animal has died.** In California, fully 70 percent of mammals and 68 percent of birds have been exposed to rodenticides.

Too many bites of tainted insects, birds, and mammals, and the San Joaquin kit fox could be gone forever.



POISON

Rodenticide

Kills owls that eat poisoned rodents

POPULATION: Approximately 2,200 breeding pairs in United States; fewer than 100 breeding pairs in Canada

STATUS: Threatened

RANGE: Northwestern California, western Oregon and Washington State, British Columbia (Canada)

HABITAT: Primarily old-growth, coniferous forests; mix of old and younger trees in southern portions of range

Northern Spotted Owl

Strix occidentalis caurina

A single pound of owl, claws at the ready, speeding groundward in a silent glide. Dark eyes tracking a skittering squirrel. Dinner.

The northern spotted owl, one of three subspecies of spotted owls in western North America, lives and hunts in old-growth forests from southern British Columbia through northern California. Its already-small range is limited further to areas with flying squirrels and dusky-footed woodrats, its preferred prey. While its range is limited, **its feeding territory is large:** A juvenile may fly two dozen miles from the nest where it hatched in search of food.

Studies show that more than 70 percent of these owls test positive for rodenticides, which they have ingested from poisoned prey.



Pamela Hawken

This owl mates for life but doesn't build its own home. Instead, it relies on abandoned nests and tree cavities for daytime coverage and breeding. Clutches of two eggs are typical, and young are ready to fly those **two dozen miles when they're just three or four months old.**

Human activities, most specifically logging, have put the northern spotted owl's very survival in jeopardy. They don't tolerate habitat disturbances well, and mismanagement of forests can spell disaster. Indeed, these owls received Endangered Species Act protections in 1990 due to habitat loss. Today the owl faces a new threat from the poisons we use to control rodents. Studies show that **more than 70 percent of these owls test positive for rodenticides**, which they ingest from poisoned prey. And an increase in illegal marijuana growing in the owl's habitat is leading to a higher use of rodenticides.

Most rodenticides kill through anticoagulant action—unstoppable internal bleeding. Death can occur quickly, or the target animal may live several months with the highly toxic chemical in its system. As a result, there is a ripple effect as a non-target species—in this case, this vulnerable owl—eats its prey, and an entire food web becomes contaminated. Rodenticides are also found in non-target animals such as barred owls, bobcats, mountain lions, and San Joaquin kit foxes—another endangered species.

That skittering squirrel? If it has ingested rat poison, it might kill an owl quickly. **Or it could bring slow death** that takes weeks.



DANGER

Pesticides

Abnormal brain function in bats

POPULATION: About 560,000 (2017)

STATUS: Endangered

RANGE: Primarily Southern and Midwestern states, portions of the Mid-Atlantic and New England

HABITAT: Hardwood and mixed-wood forests, grasslands, crop fields



Indiana Bat

Myotis sodalis

Pitch three pennies into the air, and you could be launching an Indiana bat into flight. Bats are the only mammals capable of true, sustained flight, and the Indiana bat has an impressive wingspan of 9 to 11 inches, yet weighs in at only about a quarter of an ounce—about as much as those three pennies. All other brown-haired bats have black lips, but the Indiana bat's lips are pink. Their scientific name—*Myotis sodalis*—translates to “mouse-eared companion.” And that they are; these furry little animals hibernate in a cave with some **50,000 bat friends**.

Harmful chemical residues in a bat's body can cause abnormal brain function and reduced immunity.



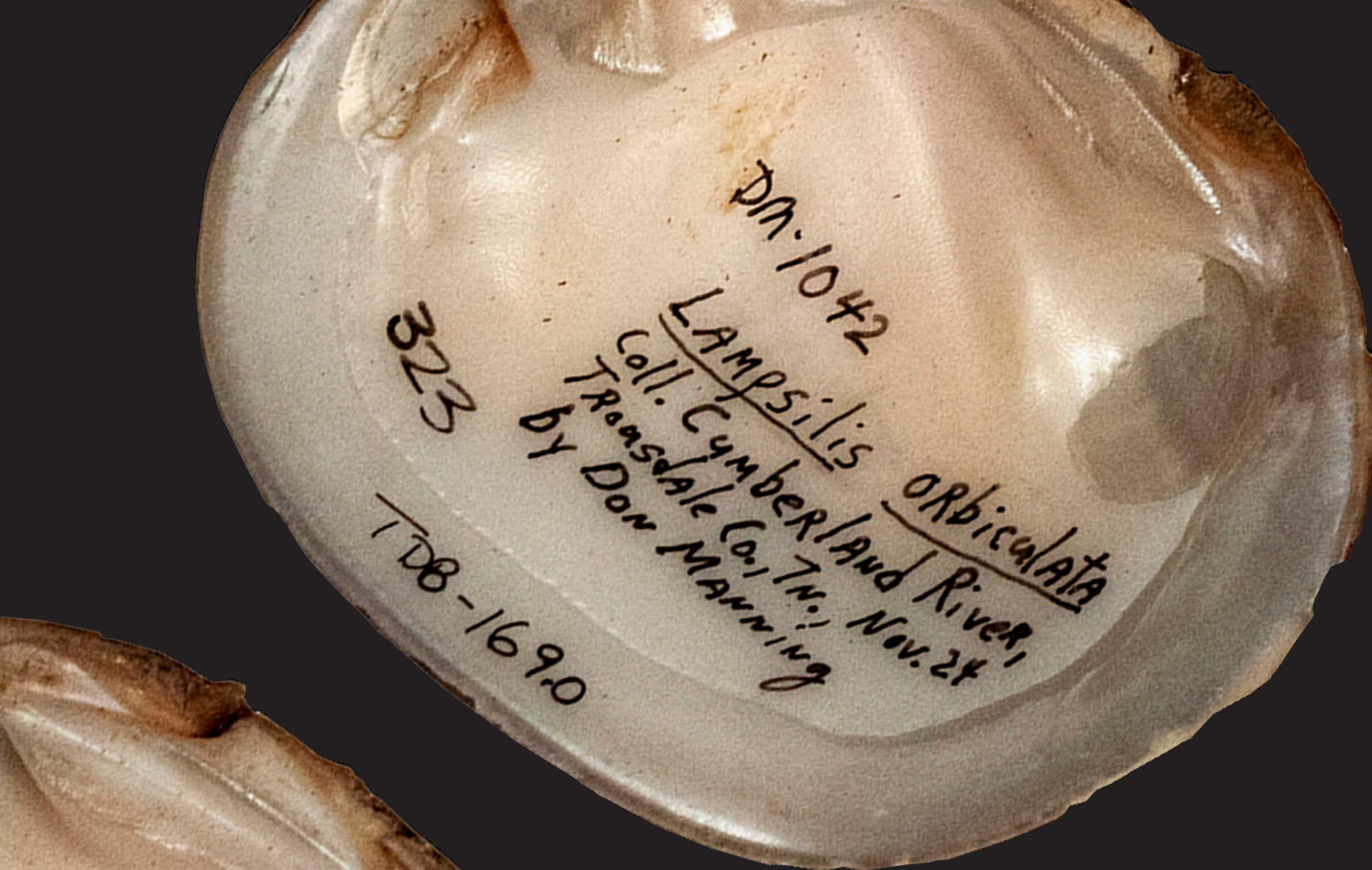
Ann Froschauer / USFWS

And they are true friends to humankind. They scour night skies for insects that can harm crops, act as vectors for disease, or otherwise make us miserable (think mosquitoes). They provide non-toxic pest control services estimated in the billions—potentially more than \$50 billion—each year: **A single bat can eat up to 3,000 insects in just one feeding.** And they pollinate plants and distribute seeds, too. Even bat guano is important—it provides nutrients in cave ecosystems that nourish other animals like salamanders, fish, and crayfish.

At least 15 species of bats, primarily in the eastern half of the United States and Canada, have been afflicted by white nose syndrome, a fungal disease that spreads like wildfire through hibernating colonies. More than 6 million bats have died from this disease since it was first reported in 2007, and the already-endangered Indiana bat has been hit hard.

Adding insult to injury, **the United States uses more than a billion pounds of pesticides each year**, contaminating the bats' prey base. Remember those 3,000 bugs for dinner? Thanks to us, those insects can be full of toxins, harmful residues that can build up in a bat's body and cause abnormal brain function and reduced immunity. Combined with reductions in habitat protections recently enacted by the Trump administration, bat populations are more at risk than ever.

Three cents' worth in weight, **billions in benefits.** We must take better care of our endangered flying friends.



DANGER
Glyphosate
Can kill baby mussels

POPULATION: 2,500 – 100,000 at most

STATUS: Endangered

RANGE: Alabama, Arkansas, Georgia, Illinois, Kentucky, Louisiana, Mississippi, Missouri, Ohio, Tennessee, Virginia, West Virginia

HABITAT: Gravel, sand and cobble beds in generally shallow freshwater rivers and tributaries



Pink Mucket Pearly Mussel

Lampsilis abrupta (formerly *Lampsilis orbiculata*)

With its charming name and iridescent inner shell, the pink mucket pearly mussel is a small bivalve historically found in more than two dozen rivers in the eastern United States. As an indicator species, mussels signal changes in water quality, and as siphon feeders, they make water healthier by filtering out algae and pollutants. They provide structure to river channels and shelter to other animals, including small fish who inhabit empty shells. And they are food for fish, amphibians, birds, reptiles, and mammals.

They are outright killed by glyphosate, the main ingredient in Roundup® and more than 750 other common weed killers used on roadsides, lawns, and industrial scale farms.



Craig Stihler/USFWS

This mussel's population has plummeted, largely as the result of human activities. We've overharvested them to make buttons. Heavy silt from our logging and strip mining has smothered their river-bottom habitats. Our widespread dams and reservoirs flood the shallow, flowing waters they need. Indeed, one study identified 45 mussel species in a river before a dam was built. After construction, **not a single species could be found**. With their numbers dramatically reduced, the pink mucket gained Endangered Species Act protections in 1976.

The pink mucket's life cycle unfolds over three seasons. Males release sperm into the water in late summer or early fall, and the female siphons in this water and fertilizes eggs in her gills. Come spring, she produces a lure to attract a host fish, then shoots her larvae onto its gills, where they mature into juveniles. These young mussels, now sporting shells, drop from their hosts to the shallow river bottom, and if the habitat is healthy, they grow to about 4 inches long. A lucky pink mucket might live as long as 50 years.

But those tiny young mussels are extremely fragile. They must have just the right conditions—and especially clean water—to survive. They are highly vulnerable to pollution and pesticides, including atrazine, carbaryl, and diazinon. Agricultural, industrial, and residential runoff imperils them. And they are outright killed by glyphosate, the main ingredient in Roundup® **and more than 750 other common weed killers used on roadsides, lawns, and industrial-scale farms**. Millions of acres of commercially grown cotton, corn, and soy are doused with glyphosate every single year. Use in the United States since Roundup® hit the shelves? About 3.5 billion pounds.



DANGER

Glyphosate

Kills the monarch's host plant

POPULATION: Total population has declined by approximately 80% over 20 years

STATUS: Under review for listing

RANGE: Primarily continental United States into central Mexico

HABITAT: Open meadows, gardens, and agricultural areas with nectar-producing plants and milkweed; in winter, protected, temperate forests



Monarch Butterfly

Danaus plexippus

Few things are sweeter than the sight of a butterfly flitting in a garden on a summer's day, and especially if that butterfly is a monarch.

Up to a billion monarchs used to color our skies each summer, but **their numbers have dropped dramatically**. In the past twenty years, the monarch population has declined by an alarming 80 percent.

If we don't act fast to end our addiction to glyphosate and other powerful herbicides, the monarchs' inspiring migration could come to an end.



USFWS

Monarchs make an extraordinary migration that can take them hundreds or even thousands of miles—from as far as southern Canada down to overwintering sites along the California coast or in central Mexico and back again. And they return to those same sites generation after generation, even though it takes several generations to complete a single migration. Monarchs lay eggs on milkweed plants at stops along the way, and the generation born at each stops then resumes the journey. The fact that a monarch can find its way to the very home that sheltered its great-great-grandparent the winter before is one of the most astonishing feats of nature.

But we've interrupted that migration, and with devastating results. Given their fragility and the threats they face, monarchs need large populations to survive. They have the ability to reproduce in great numbers, but there's a catch: **Monarch caterpillars are 100 percent reliant on milkweed**. It's the only thing they eat. And the vast majority of monarchs migrate over the country's broad agricultural belt, where Big Ag's GMO crops fill the farmlands—millions of acres of corn and soybeans that are genetically engineered to withstand the plant-killing pesticide glyphosate, commonly sold under the Roundup® brand.

Since the introduction of these engineered crops, nationwide glyphosate use has skyrocketed—from under 30 million pounds per year in the early 1990s to nearly 300 million pounds in 2016 alone. And while genetically modified crops are designed to thrive despite this herbicide flood, Roundup® kills virtually every other plant in its path, including milkweed. Without that milkweed, the monarch butterfly population has plummeted. If we don't act fast to end our addiction to glyphosate and other powerful herbicides—and restore native milkweed and other key habitat—the monarchs' inspiring migration could come to an end.



Staff Choice

Hine's Emerald Dragonfly, *Somatochlora hineana*

Dragonflies symbolize courage, power, and wisdom. Legend has it that they bring good luck, too, though that may not come soon enough for the Hine's emerald dragonfly.

This glittering emerald dragonfly lives its life in two chapters—a long first phase as it slowly matures, and then only about a month, as an adult, flying free. As a nymph, it spends as many as four years in a marshy home, shedding its skin frequently and feasting on smaller aquatic insects—or ending up, itself, as dinner for a duck. And during this time, it is vulnerable to contamination, in part because it is young, and in part because wetlands, as natural filters, are traps for pollutants carried in rainwater and runoff. Pesticides are particularly harmful. Insect, snail, and other wetland diversity may have its numbers cut in half due to pesticides. And dragonflies are among the hardest hit. No wonder, since a Hine's emerald, for instance, can be trapped for some 200 weeks—almost its entire lifetime—in a home that may be awash in poisons.

And the sight of those emerald wings glinting on a summer's day? Don't blink. If you do, this dragonfly could be gone before you open your eyes.

A Hine's emerald can be trapped for some 200 weeks—almost its entire lifetime—in a home that may be awash in poisons.



Hine's emerald dragonfly, Paul Burton/USFWS

POPULATION: Unknown

STATUS: Endangered

RANGE: Illinois, Michigan, Missouri, and Wisconsin

HABITAT: Marshes and sedge meadows



EARTHJUSTICE



For references, video clips, and more information, go to
endangered.org/references

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