

### WILDLIFE AND THE ENVIRONMENT

**Nature's Newsletter** 

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# **DISCOVERING NATURE**





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#### GETTING INVOLVED IN MARINE CITIZEN SCIENCE PROJECTS IN NEW YORK STATE

DEC offers a variety of citizen science opportunities for community members to participate in marine science research and conservation efforts. Participating in citizen science programs offers hands-on experiences in data collection and research methods while providing DEC biologists with essential data to better conserve New York's marine life. Learn more about the various opportunities below and how to participate!

https://www.dec.ny.gov/outdoor/109925.html

# Flipper Files: A Marine Mammal and Sea Turtle Sighting Survey

Dolphins, whales, seals, and sea turtles are some of the most exciting marine life to observe along New York's coasts. Report your sightings of these animals using DEC's Flipper



© Screen Shot Provided by Morris Hills Environmental Action Club CONTRIBUTING CLUB MEMBERS - TOP (Left to Right): Ahmed Joseph Elsayyid; Frank Cappuccio; Aditya Kasarla; Sofia Castano. CENTER (Left to Right): Akhilesh Jonnalagadda; Neel Godbole; Sunny Yu; Keshaw Sheth. BOTTOM (Left to Right): Aditya Venuri; Amelia Wong.

# PRACTICAL STEPS TO STOP CLIMATE CHANGE IN ITS TRACKS

by Morris Hills Environmental Action Club Morris Hills High School, NJ

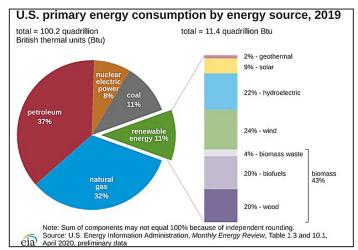
"The 20 warmest years on record have been in the past 22 years" / "More than 1 million species are at risk of extinction" / "The worst impacts could be irreversible by 2030".....

When we hear about climate change in the news and online, it is easy to feel overwhelmed by the desperation of it all: How could we possibly avoid imminent doom when there is so much work to be done? Even with broad consensus for a bold response to carbon emissions, can the global community find a path forward? This is not to mention the scary timeline that clouds over the crisis, such as the year 2030 when, in less than a decade, irreversible effects of the climate crisis are expected to take impact.

With so little time and the stakes being so high, it is only natural that many adopt a pessimistic outlook and become demoralized to fight against a seemingly predestined doom. But this does not have to be the case: Here are 5 practical steps that global leaders can take, starting today, in order to dodge a climate catastrophe:

#### Step 1: Unite Against Coal

When we consider who the "villain" is in the fight against climate change, fossil fuel as a general industry is typically singled out. This industry, however, accounts for over 80% of the US's primary energy consumption according to the Energy Information Administration. Critics of aggressive climate action, therefore, argue that "the lights will be off"



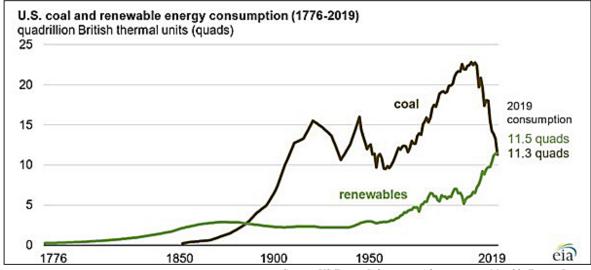
Source: US Energy Information Administration, Monthly Energy Review, April 2020

with policies that would suddenly kill fossil fuel. And they would not necessarily be wrong.

While all fossil fuels contribute to carbon emissions, there is one particular non-renewable source of energy that should become a universal enemy in the climate fight: **continued on page 4** 

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## PRACTICAL STEPS TO STOP CLIMATE CHANGE IN ITS TRACKS



Source: US Energy Information Administration, Monthly Energy Review

Coal. Coal combustion is more carbon intensive than burning natural gas or petroleum for electricity; While coal represented only 28.4 percent of the electricity generated in the United States in 2018, its use accounted for about 65.8 percent of CO2 emissions from the sector according to the Environmental Protection Agency. Targeting coal would also have the least detrimental impact on jobs, as approximately 50,000 Americans are currently employed as miners, while millions of jobs are supported by the oil and natural gas industry.

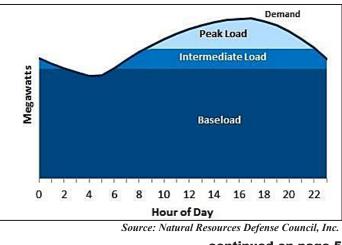
These facts, along with coal's effects outside of global warming as a leading cause of mercury and sulfur dioxide pollution, has begun to transform the energy into a common adversary across the political spectrum. After the shale gas revolution, which suddenly made natural gas cheaper than coal, coal's share of the U.S. electricity supply has dropped dramatically from 50 percent to under 30 percent in the past 15 years. Although many climate activists may be regretful that hydraulic fracturing and horizontal drilling has led to such a significant increase in American production of oil and natural gas, this increase has largely come at the expense of coal mining and has helped diminish its dominance over the US energy industry.

With the coal's declining economic advantage and its share of the American electricity supply falling, ending our addiction to this dirty form of energy is the best "first step" for a pragmatic's solution to climate change. The costbenefit analysis of killing off this primitive form of energy presents it as the least painful industry to aim while yielding the most benefit.

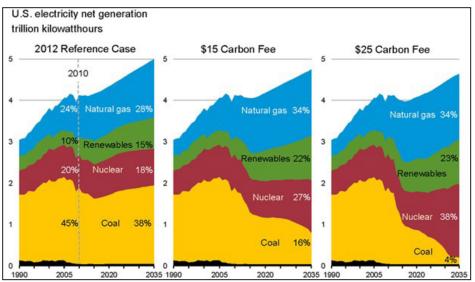
#### **Step 2: Focus on Baseload Renewables**

What makes fossil fuels attractive today is not only its relatively low cost, but also the reliability factor: Natural gas can supply power on demand, 24/7, regardless of whether the sun is shining or the wind is blowing. To create an effective transition away from these non-renewable sources, there is a necessity to expand clean baseload energy sources that can continually supply power to the grid. Ultimately, the Government would have a role to cut any unnecessary regulations holding back these energies while subsidizing construction costs to ramp up their presence.

Nuclear power: Nuclear reactors in the United States operate 90 percent of the time, contrasting sharply with intermittent renewable energy, like solar and wind, which will only be operating about a third of the time. Nuclear energy also boasts a competitively low price compared to its fossil fuel counterparts, but does not emit any greenhouse gases. And while the US has faced many coal mine tragedies, oil spills, and deadly natural-gas pipeline explosions, no American has died from a nuclear accident at a US commercial reactor.



Hydroelectric power: The sun will always set and the wind



eventually dies down, but water usually has a constant and steady flow 24/7. Although there is a big price tag to build a new hydropower plant, they provide very inexpensive power once in operation. Along with being emission-free and renewable, hydropower plants can even adjust the flow of water to produce more energy when demand is high or cut energy output demand is low, something no other renewable source can do.

*Geothermal power:* It is very easy to predict Geothermal power plant's energy output: Plants run 24 hours, 7 days a week, constantly producing electricity. While Geothermal power may be location dependent and expensive to implement, it has a 100+ year track record of offering a stable energy supply without sending harmful emissions to the atmosphere.

It's impossible to maintain an economy without energy infrastructure that can run 24/7 on the clock. Although fossil fuels are seen as a flexible and reliable (but dirty) source of power to meet the daily global demand, these energies offer the crucial alternatives needed to help facilitate a smooth transition to a cleaner grid.

# Step 3: Supplementing Baseload with Intermittent Sources

Baseload renewables do a great job producing a constant level of energy production. But rarely are our energy needs so consistent. After having baseload renewable energy infrastructure built, there is a place for other renewables to meet the fluctuation in demand that occurs throughout the day.

The electricity industry is quite familiar with two periods of usage: On-peak hours cover hours roughly from 7:00 a.m. until 11:00 p.m. during the work week, while off-peak hours generally falls weekdays 11:00 p.m. and 7:00 a.m.

Source: EIA, Annual Energy Outlook 2012

and throughout the weekend. Meeting these changes in demand is where intermittent electricity sources can play a major role. Two of the famous ones are:

*Solar power:* Solar energy's key asset is that we can never "run out" of it: Although the sun may not be shining in all parts of the world 24/7, solar energy will be viable as long as the Earth continues to orbit along the sun (which should give us at least 5 billion years left!). The solar sector supports roughly a quarter of a million jobs, offering support to energy workers who will be transitioning away from fossil fuel industry employment.

*Wind power:* Harnessing the energy of the wind is not only clean, but surprisingly cost-effective: According to the US Department of Energy, land-based utility-scale wind is one of the lowest-priced energy sources available today, costing 1–2 cents per kilowatt-hour after the production tax credit. The wind sector could also offer jobs that would replace those lost in the fossil fuel industry, with the potential to support more than 600,000 jobs in manufacturing, installation, maintenance, and supporting services by the middle of the century. Wind power is sustainable and predictable, and our nation's supply of wind is limitless.

Even though the sun vanishes at dusk and the wind will always die down at times, these intermittent sources can play a key role in meeting the periods of peak energy demand. Renewables need all hands on deck to fulfill the calls for a high-consumption modern economy.

#### Step 4: Using disincentives

Ultimately, the goal of any successful climate action plan is to expand clean energy, cutting down cost and regulatory barriers to renewable production and ultimately making fossil fuel irrelevant. However, even with the support of

## continued from page 5 PRACTICAL STEPS TO STOP CLIMATE CHANGE IN ITS TRACKS

government subsidies and an easy-to-start regulatory environment, there may be a need for fossil fuel to be handicapped to reach climate goals.

It is never desired (or politically favorable) to have an industry purposefully curbed by government intervention, however, there comes times when restrictive policies must be adopted when these energies have become too economically attractive. There have been many instances when technological advances in fossil fuel have made the energy source incredibly cheap and favorable to industrial consumption, one notable example being the Shale Gas Revolution.

One way to prevent this situation is by removing the key incentive to fossil fuel: The low cost. A carbon tax, for instance, is a fee imposed on any company that burns fossil fuels, such as the Dutch national carbon tax of 30 euros per metric ton of carbon. This type of disincentive curbs emissions with one critical blow: A greater expense for carbon-based sources will push companies to accelerate the transition to clean energy. This tax is also viewed as a way for fossil fuel companies to carry the cost of their environmentally destructive practices, and allow revenue raised to support climate initiatives.

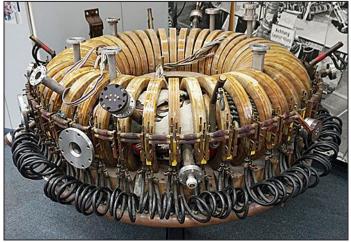
Another target could be the generous subsidies these companies receive directly from the taxpayers' pocket. According to the International Monetary Fund, coal, oil and gas industries benefit from \$5 trillion dollars a year – \$10 million a minute. Reducing those forms of support can help hasten the switch by the corporate sectors away from these energies, while raising revenue for other expensive climate projects in the process.

#### Step 5: Tech Advances

This summer, scientists hope to cross a major milestone in renewable energy development: Testing the first ever fusion reactor.

The promise of fusion is using a very small amount of energy to yield a massive quantity of power: Just like how the Sun and stars stay shining so bright, these reactors try to fuse the nuclei of two atoms to release an abundance of nuclear energy. Fusion would revolutionize the renewable industry, bringing a source of nuclear energy that produces no long-lived radioactive waste and with cheap, abundant fuel.

It is not just the nuclear field that shows exciting advancements for renewable technology: The Department of Energy is allocating up to \$100 million into the research and development of hydrogen and fuel cells. Hydrogen is a clean fuel that only produces water as a byproduct in a fuel cell, and it can help make the notoriously pollutant



Source: Wendelstein fusion reactor coil, Wikimedia Commons.

manufacturing and transportation industries 100% clean. In the solar industry, many are excited at the expansion of marine solar, beginning projects to start floating solar arrays on freshwater bodies.

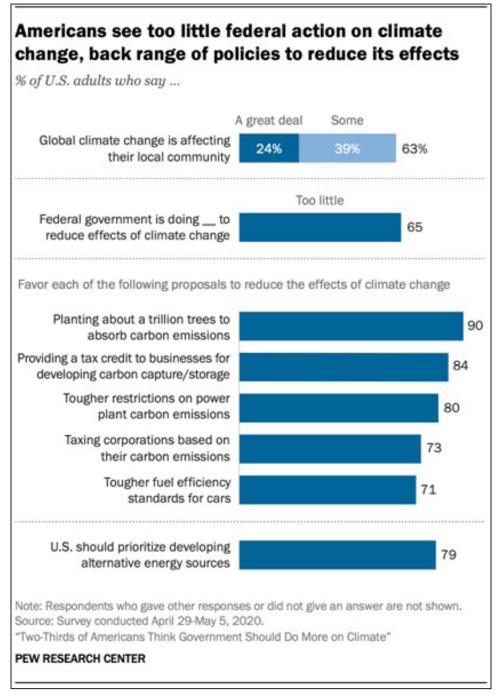
Although the technology already exists to reach a 100% carbon neutral goal, these advancements will be crucial to keep renewable energy economically competitive and efficient. A renewable-dominated energy grid should not be carried on the back of heavy government subsidies in perpetuity; major breakthroughs in clean energy can make it a naturally more attractive source of energy for cheap and accessible energy for corporations across the world.

#### **Rallying Momentum**

In the beginning of this article, it was promised to present 5 "*practical*" steps to prevent the worst of climate change. However, many readers may question how likely it is that such comprehensive action can be achieved. Admittedly, Step 1, to effectively kill the coal industry, does not currently have the political momentum in the halls of Congress to make any real legislative progress, and faces staunch opposition from the numerous coal mining states such as West Virginia, Wyoming, and Pennsylvania.

Any political action against the US Energy Industry requires broad support from the American electorate, leading to a "hidden" preliminary step to our 5-step plan: Education. Today, studies from groups such as the Yale Program on Climate Change Communication show how young people from across the political spectrum have recognized the imperative for a large-scale climate response, demonstrating that recent education initiatives in schools have led to climate action becoming a bipartisan issue. Decades of research and observations from climate scientists already describes the risks of inaction; now, we must educate the public about those dangers.

# PRACTICAL STEPS TO STOP CLIMATE CHANGE IN ITS TRACKS



Education does not need to be confined to schools; even articles like this one seeks to build steam for further action from readers. If we, as concerned citizens, act as "climate ambassadors" to educate our own communities about the urgency to take the initiative on approaching a crisis, we can transform climate change into a unifying issue rather than a source of division.

#### **RESOURES:**

https://climate.nasa.gov/resources/education/ https://www.commonsense.org/education/articles/6-free-tools-for-teaching-about-climate-change https://www.commonsense.org/education/top-picks/climate-change-resources-for-students-and-teachers https://www.climate.gov/teaching



Jaguar

© Photo courtesy of Wikimedia Commons/Cburnett.

For Immediate Release, March, 2021

### Scientists Identify 20 Million Acre Habitat Area for Jaguars in Arizona, New Mexico

#### New Study Finds Habitat for More Than 150 Big Cats, Lays Groundwork for Potential Reintroduction

TUCSON, Ariz.— A team of scientists has identified a wide swath of habitat in Arizona and New Mexico — 20 million acres, or about 32,000 square miles — that could eventually support more than 150 jaguars.

In a study published in Oryx—The International Journal of Conservation, the team says that the central mountains of the two states, which they call the Central Arizona/New Mexico Recovery Area or CANRA, offers new opportunities for the United States to contribute to recovery of the species.

Authors of the study include scientists from the Wildlife Conservation Society (WCS), Defenders of Wildlife, Center for Biological Diversity, Wildlands Network, Pace University, U.S. Geological Survey, Universidad Autonoma de Queretaro, Bird's Eye View, IUCN and Bordercats Working Group.

The multidisciplinary group of scientists compared 12 habitat models for jaguars in Arizona and New Mexico and found an area of habitat the size of South Carolina, roughly 100 miles from the southern border with Mexico. This area was not considered in the U.S. Fish and Wildlife Service's jaguar recovery plan, released in 2019, but the Service left open the possibility of revising the recovery plan boundaries as new information, such

as this study, became available.

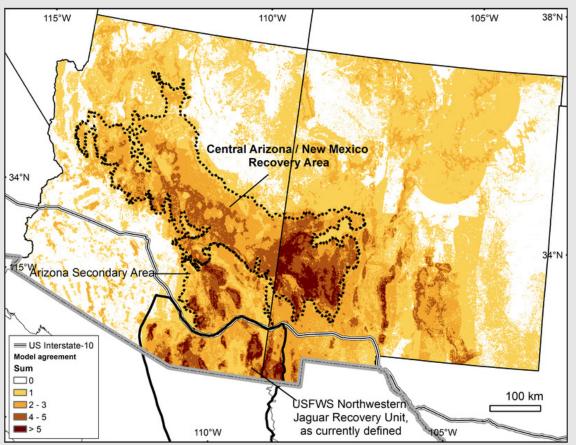
"There is a lot more potential jaguar habitat in the United States than was previously realized," said Eric W. Sanderson, WCS senior conservation ecologist. "These findings open a new opportunity for jaguar conservation in North America that could help address threats from habitat loss, climate change and border infrastructure."

Jaguars are now considered an endangered species across their range (including the United States), and state-level protections exist in Arizona and New Mexico. Over the past two decades, seven male jaguars have been photographed in the mountains south of Interstate 10.

"It should come as no surprise that the forested Mogollon Plateau, which teems with deer, elk and javelina, now has scientific recognition as good jaguar habitat," said Michael Robinson of the Center for Biological Diversity. "This region was the last stand for breeding jaguars after their elimination elsewhere in the U.S., and these beautiful cats could thrive here again."

Jaguars are often associated with tropical habitats such as the Amazon and Central America, but historically they were found as

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Central Arizona/New Mexico Recovery Area. Map courtesy of Sanderson et al. (2021) published in Conservation Science and Practice.

far north as the Grand Canyon. The last jaguar north of the I-10 freeway was killed by a U.S. government hunter in 1964.

"This fresh look at jaguar habitat in the U.S. identifies a much larger area that could support many more of these big cats," said Bryan Bird, director for Southwest programs at Defenders of Wildlife. "This expanded area of the Southwest is 27 times larger than the current designated critical habitat. We hope these findings will inspire renewed cooperation and result in more resident jaguars in the U.S."

"Jaguar recovery in the northern extreme of its range is of interest to both the U.S. and Mexico, and having this analysis — which clears previous misconceptions about available habitat — is indispensable to make informed decisions for international efforts," said Juan Carlos Bravo, Wildlands Network's Mexico and Borderlands program director.

Recent and historical jaguar observations in the United States and northern Mexico can be found at jaguardata.info.

The Center for Biological Diversity is a national, nonprofit conservation organization with more than 1.7 million members and online activists dedicated to the protection of endangered species and wild places. Visit: https://www.biologicaldiversity.org/. WCS saves wildlife and wild places worldwide through science, conservation action, education, and inspiring people to value nature. To achieve our mission, WCS, based at the Bronx Zoo, harnesses the power of its Global Conservation Program in nearly 60 nations and in all the world's oceans and its five wildlife parks in New York City, visited by 4 million people annually. WCS combines its expertise in the field, zoos, and aquarium to achieve its conservation mission.

Visit: newsroom.wcs.org Follow: @WCSNewsroom.

Defenders of Wildlife is dedicated to the protection of all native animals and plants in their natural communities. With nearly 2.2 million members and activists, Defenders of Wildlife is a leading advocate for innovative solutions to safeguard our wildlife heritage for generations to come. For more information, visit Defenders.org/newsroom.

Since 1991, Wildlands Network been committed to reconnecting, restoring and rewilding North America so that life — in all its diversity — can thrive. Our work is founded in science, driven by fieldwork and furthered through strategic policy and partnerships. We envision a North America where nature is undivided, and where people coexist in harmony with our native plants and animals.

Visit wildlandsnetwork.org to learn more.



# THE GOLDEN SILK ORB-WEAVER

#### by Pirchia Broder Naturalist

I'm like everyone else; when I hear the word spider my immediate reaction is UGH! Or in my mind's eye I see Spiderman in his red fitted suit leaping through the air from one long thin thread to another. More often than not spiders evoke screams. I scream. But, less so, since volunteering at the Spiders Alive special exhibit at New York's American Museum of Natural History. The exhibit consisted of a variety of fascinating, living spiders such as the black widow spider, tarantulas, scorpions and the golden orbweaver. The main premise was to introduce and educate the public to the importance of spiders in our ecosystem. The museum's 75 year old spider research program has one of the largest collection of spiders.

Spiders are not insects they are Arachnids. They have two body parts, eight legs, no wings, no antennae, are unable to chew and do not see very well; they have simple eyes. They need to use touch and smell in order to capture prey. Insects, however have three body parts, six legs, usually have wings, have antennae and usually have very good vision with complex eyes. Spider skeletons are rigid and are on the outside of their body. In order to continue to grow the spider has to shed its outer shell, this exoskeleton, several times during its lifetime. When shedded the exoskeleton is an exact replica of the body and leaves the spider in a vulnerable state until it develops a new exoskeleton.

Most spiders live for about a year, but believe it or not the tarantula, also a spider, can live for 15 years, literally as long as my cat.

So why am I taking time to talk about them? Well for one, spiders have one thing that does not exist anywhere on earth; they all produce silk, silk with enhanced properties. **continued on page 11** 

## continued from page 10 THE GOLDEN SILK ORB-WEAVER



© LEFT : Simon Peers and Nicholas Godley https://www.nytimes.com/2009/09/23/arts/design/23spiders.html RIGHT: Adrian Dennis//AFP/Getty Images https:// www.washingtonpost.com/national/health-science/london-museum-displays-textiles-made-from-golden-silk-of-millions-of-spiders/2012/01/25/gIQAPkH2cQ\_story.html

Museums have displayed capes and shawls that have been woven from the golden orb weavers silk. LEFT: Shawl displayed at the Museum of Natural History, 2009. Made from the silk of more than a million spiders, 70 people spent four years collecting golden orb spiders workers extracted about 80 feet of silk from each. RIGHT: Simon Peers, left, and Nicholas Godley stand beside Bianca Gavrilas as she shows off a cape made from the silk of the golden orb spider. Silk was extracted from about 1.2 million spiders. Displayed London's Victoria and Albert Museum, 2012

Silk that man wants to duplicate and utilize but has been unable to do so.

Spiders have been on Earth for more than 300 million years, to date approximately 45,000 species have been identified. Of those, approximately 200 types can cause some harm to human beings. Most do not, and most do not wish to interact with you. They want to run away from you. They are also necessary for our ecosystem. They live on every continent, excluding Antarctica. They help in the balance of nature through controlling insect populations. Spiders consume a massive amount of insects and are capable of eating approximately 80 pounds of insects in one acre, in one year. They eat pests and disease carrying insects such as mosquitoes (my favorite). There's even a species of jumping spider that likes to eat blood filled mosquitoes. In turn, spiders are also a source of food for birds, lizards, wasps, and mammals.

All spiders produce silk, all silk is not the same; nor do all spiders weave webs. Only the females make silk. Silks properties differ and are used differently based on needs of the spider. Spiders can make as many as 7 or 8 different types of silk. Each varying in strength, density, toughness, elasticity, and stickiness. All are used for different purposes; whether for constructing their web, catching prey, traveling (called ballooning where a spider can float many miles hanging onto woven silk), securing their home, protecting their eggs or for food. Silk is protein. When needed, spiders will consume their silk as a source of food.

Orb weavers are found all over the world. The Golden Silk Orb-Weaver (officially Nephila) is a spider that weaves golden colored silk for its web. They are found in Australia, Asia, Africa, Madagascar and in North America,s warm climate; spanning from North Carolina thru Texas. Many have complex webs and some display zigzag patterns woven into their webs. The female is 1.5 - 2 inches, excluding her limbs. The male is 1 inch.

Their silk is stronger than any man made or natural fiber on Earth and it is versatile. It is stronger than Kevlar, is more durable, and is extremely elastic (it can be stretched up to five times its length without breaking), and is lightweight: A strand long enough to circle the Earth would weigh less than a bar of soap. Consisting of mainly protein, silks are about a sixth of the density of steel. Producing silk naturally is ecofriendly and completely biodegradable since spider silk is drawn from water. Based on these silk properties science and major industries see a potential use of spider silk for:

-bullet proof vests, helmets, cables, tires, car airbags, parachutes, nets, and ropes

-medicinal purposes such as bandages to stop bleeding, surgical thread for sutures, surgical thread for sutures, tendons, ligaments, and coating implants.

-light weight durable clothing- Adidas's has been producing shoes made from bio fabricated spider silk. Mary McCartney has teamed up with Bolt Threads, a biotechnology company to explore spider silk for her clothing line.

Spider silk is a liquid protein made of amino acids. It is stored in the spider's silk glands. A spider can have anywhere between 1 to 8 glands that store this protein.

### continued from page 11 THE GOLDEN SILK ORB-WEAVER



Each gland will enable the production of different types of silk. These glands are connected to spigots, each with a valve. The spigots are on the tip of spider spinnerets. When silk is needed the liquid is compressed through the spigot's valve and is pulled. As the liquid protein is pulled out it emerges into the air and molecularly formulates into a solid thread which is the silk. "By winding different silk varieties together in varying proportions, spiders can form a wide range of fiber material. Spiders can also vary fiber consistency by adjusting the spigots to form smaller or larger strands. Some silk fibers have multiple layers -for example, an inner core surrounded by an outer tube. Silk can also be coated with various substances suited for different purposes. Spiders might coat fiber in a sticky substance, for example, or a waterproof material." https:// animals.howstuffworks.com/arachnids/spider3.htm

The problem is that golden orb web weavers are spiders and all spider silk comes from spiders which means it all comes with spider issues. Most spiders are predatory carnivores and will eat each other and or other spiders. They cannot be farmed. Orb weavers need space, lots of space to weave their web. All orb weaving spiders make suspended, sticky, webs. Webs are established between trees. Webs can span 5 feet wide by 3 feet high. Some are even larger. The silk is made of complex protein molecules and repetitive DNA sequences which science has yet to replicate. The silk is difficult to work with since it hardens when exposed to air. It takes many people, a lot of hours, and many spiders to produce cloth. This is evident with the cape and shawl displayed at the museums. Those required at least 1,000,000 golden orb weaver spiders.

In an attempt to produce spider silk scientists from Utah have been inserting silk genes into goats to produce

© Pirchia Broder, Photographer

silk proteins in their milk. The research is based on a "transferred gene for spider silk protein into the goat genome and have put it under the same cell regulation system as the other milk proteins. So it is only made during lactation and only in the udder..... Right now both the USDA and the FDA are regulating the transgenic animals and since we are not beyond the research stage, they have not required anything beyond their standard transgenic animal regulations." *https://agfundernews.com/what-happened-to-those-gm-spider-goats-with-the-silky-milk.html* 

Dr. Randy Lewis, a molecular biology professor at the University of Wyoming, is also working with this methodology which was originally started at a Canadian biotechnology lab. "Lewis now has 30 spider goats at a farm at Utah State University. For every seven goat kids that his spider goats produce, only three would possess the silk protein gene. After the maturation of the transgenic goats, their milk will be harvested and pasteurized to extract larger quantities of spider silk proteins." *https:// www.discoveryscientificsolutions.com/item/31* 

It is unclear at this stage how, or if, it will become feasible to replicate, in volume, spider silk with all its properties. But the next time I encounter a spider I will refrain from doing it any harm. I will not destroy it's web. I will remember some of it's unique properties and the spider's importance in the *balance of our ecosystem*.

#### ADDITIONAL RESOURCES:

https://en.wikipedia.org/wiki/Nephila

https://arachnipedia.fandom.com/wiki/Golden\_silk\_orb-weaver\_ (Nephila)

http://entnemdept.ufl.edu/creatures/misc/golden\_silk\_spider. htm

https://www.youtube.com/watch?v=JW7tLXelv3M



Eastern black rail

© David Seibel, Photographer

# **EASTERN BLACK RAIL Elevated to Threatened Status**

by Bryan D. Watts, Ph.D. Mitchell A. Byrd Professor of Conservation Biology / Director, Center for Conservation Biology College of William & Mary

On November 9, 2020 the eastern black rail was formally listed as *Threatened* under the Endangered Species Act by the Department of Interior following on the recommendation of the U.S. Fish and Wildlife Service, published on October 9, 2018. This action concludes a 25-year campaign by The Center for Conservation Biology (CCB) and other institutions to see the plight of this subspecies appropriately acknowledged and the remaining locations supporting populations protected. The action also bolsters what will be a decades-long struggle to reverse the decline and restore the form to its historic range.

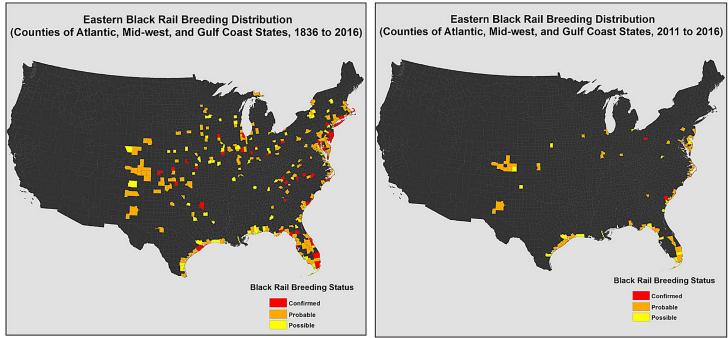
Beginning in 1995, CCB biologists took advantage of every opportunity to educate the broader conservation community about the ongoing decline of the eastern black rail population in an attempt to prioritize the species for conservation attention. Despite a relentless effort, no tangible traction was achieved for the following 15 years. After a Chesapeake Bay-wide survey during 2007 showed a greater than 90% decline across one of the region's strongholds, CCB established The Eastern Black Rail Conservation and Management Working Group in 2009. Between 2009 and 2015, meetings were held and several presentations were given to regional and national meetings and slowly the momentum began to build.

CCB completed a status assessment in 2016 in support of a U.S. Fish and Wildlife Service (USFWS) listing package that demonstrated a catastrophic range contraction along the Atlantic Coast of 450 km (now 800+ km) and an annual rate of decline throughout the northern portion of the range of 9%.

### continued from page 13 EASTERN BLACK RAIL Elevated to Threatened Status



High marsh habitat on Virginia's Eastern Shore. Once the nesting habitat for eastern black rails along much of the Atlantic Coast, sea-level rise has now eliminated the species from vast swaths of high marsh.



Maps of historic and recent distribution of eastern black rails by county. Contraction of the Atlantic Coast distribution to the south is continuing. © Data from CCB.

### continued from page 14 EASTERN BLACK RAIL Elevated to Threatened Status



High marsh habitat on Virginia's Eastern Shore. Once the nesting habitat for eastern black rails along much of the Atlantic Coast, sea-level rise has now eliminated the species from vast swaths of high marsh.

In the falls of 2016 and 2019, symposia were held during annual Waterbird Society meetings. In the fall of 2016, the Atlantic Coast Joint Venture (ACJV) of the USFWS adopted the eastern black rail as one of three focal species for the program and assumed responsibility for the working group.

Since that time the ACJV has organized and rapidly mobilized a consortium of individuals and organizations on behalf of black rail conservation. The ACJV has convened several in-person meetings to advance conservation efforts and continues to host regular discussions to coordinate activities. It formed a core working group that developed short and long-term population objectives and a business plan (ACJV 2020) that outlines five major implementation strategies designed to achieve objectives.

The engagement of government agencies (including all states within the historic coastal range) and conservation organizations since 2016 has been tremendous and inspiring. The working group has expanded from a few individuals and organizations to many dozens. More than 10,000 point counts have been conducted to refine what we know about the current distribution and dozens of research

and conservation projects are underway to help guide recovery. The federal listing has already had a dramatic impact on engagement and focus.

Although much work will need to be done in the coming decade, this is an exciting time for black rail work filled with constant discovery and an expanding group of scientists and managers committed to making things happen.



# ABOUT THE MISSION OF THE CENTER FOR CONSERVATION BIOLOGY

CCB's mission is to provide the global community with the information needed to drive thoughtful, sciencebased conservation, to educate and train the next generation of conservation scientists, and to make lasting contributions to the natural world through critical thinking, innovation, and ground-breaking research. *https://ccbbirds.org/* 



Mexican gray wolf (LOBO)

© Wolf Conservation Center

# SUPPORTING SPECIES SURVIVAL PROGRAM AND CONSERVATION MEDICINE

by Jamie Haas

Education Coordinator / Southwest Wildlife Conservation Center

On March 29, 1998, 11 captive-reared Mexican gray wolves (*Canus lupus baileyi*) were released to the wild for the first time in the Blue Range Recovery Area of Arizona and New Mexico. Missing from the landscape for more than 30 years, the howl of the rarest and most unique subspecies of gray wolf was once again greeted by the mountains of the southwest. This March marked the 23rd anniversary of this historic event, a significant milestone for the lobo and wildlife conservation. In recognition of the anniversary, the Southwest Wildlife Conservation Center is among the large group of partners participating in #LoboWeek, an international movement to educate people about the

Mexican wolf or "lobo" and our efforts to successfully restore this critically endangered wolf to its ancestral home in the wild.

On March 28th, Southwest Wildlife Conservation Center joined other wildlife organizations, zoos, advocacy groups, businesses, and individuals to raise awareness for the plight of the second-most endangered wolf species in North America: the Mexican gray wolf.

Supporting the Species Survival Program for the Mexican

### continued from page 16 SUPPORTING SPECIES SURVIVAL PROGRAM AND CONSERVATION MEDICINE

gray wolf also supports the third pillar of the Center's organization: Conservation Medicine. So what does that mean exactly - Conservation Medicine? We'd love to share some insight on this critical emerging field, and why is it so important. "Borne out of a collaboration of health sciences with ecological and environmental studies, conservation medicine is concerned with the health of people, animals, and ecosystems and recognizes the interrelated nature of these" (Writes for Wildlife).

Conservation Medicine recognizes the need to conserve (thus, the name) our resources, as well as the resources of other species of life on Earth. The naturalist Aldo Leopold urged humanity to "preserve every cog and wheel" of the planet, as removing or losing even one part has untold effects on all remaining pieces of the puzzle.

All of the permanent resident animals at Southwest Wildlife cannot return to the wild due to some form of human interference/encroachment in their lives. Take Zia and Felix, the sibling mountain lion kittens, for example. Originally from the Santa Monica region of California, their population suffers from habitat fragmentation. To add to that inherent problem, their mother died too young from rodent poisoning. Now, Zia and Felix are no longer able to live in their native California range, and instead will live at Southwest Wildlife for the rest of their days in peace and comfort.

#### We'll close with this bit from Writes for Wildlife, linked below.

"The current global situation we find ourselves navigating, where the human population is rapidly increasing, new diseases are emerging, and many species are becoming critically endangered has highlighted a need for a coordinated problem solving effort. A knowledge and understanding of health and disease, as well as the inherently-linked ecosystem features and environmental issues are integral to helping maintain a diversity of life on earth. Conservation Medicine is responding to these complex problems by uniting medical training (human and veterinary), with science disciplines and other knowledge including social, political, and economic. The recent increase in species extinctions (Ceballos, 2015) is devastating and this loss of biodiversity is detrimental to humans. Indeed, our future success and survival hangs upon our ability to defend and care for our planet, and therefore why conservation medicine is so important (Osofsky, 2000)."

If you're looking for ways to support Southwest Wildlife Conservation Center in our conservation mission moving forward, please make a tax deductible donation by visiting *azgives.org/southwestwildlife* or click onto our website below. Every little bit helps further our mission to save our wildlife, one life at a time.

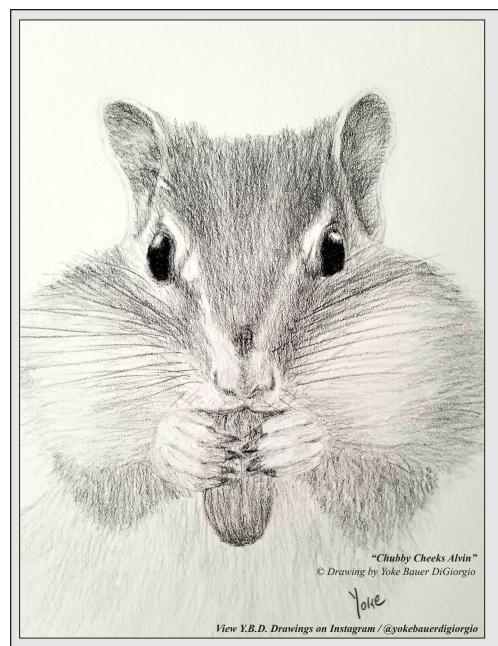


© Provided by Southwest Wildlife Conservation Center Zia and Felix / sibling mountain lion kittens from Santa Monica, California

#### **RESOURCES:**

http://www.southwestwildlife.org http://writesforwildlife.com/2018/03/03/what-is-conservationmedicine/?blm\_aid=27680769





# Things You Might Not Know About Chipmunks.....

Chipmunks / family Sciuridae need about 15 hours of sleep per day.

Weighing in at 1 to 5 ounces, chipmunks are among the smallest member of the squirrel family.

There are 25 species of chipmunks - 24 range from Canada to Mexico across a variety of terrains from forests to deserts to suburban neighborhoods. Only one species, the Siberian chipmunk, makes its home outside North America.

Chipmunks prefer subterranean living. While some chipmunks make nests in logs or bushes, most prefer to dig vast underground burrows. These hidden homes typically include a camouflaged entrance hole, tunnel systems that can stretch 10 to 30 feet long, food storage areas, and a nesting chamber (which is kept immaculately clean and lined with leaves and other plant matter).

Chipmunks have a lot of predators. Just about any carnivore bigger than one of

these little guys is a potential threat. That includes owls, hawks, weasels, foxes, coyotes, raccoons, bobcats, lynxes, cats, dogs, snakes, and sometimes even their own squirrel cousins. Chipmunks avoid becoming meals by being quick and nimble — and sticking close to home.

Chipmunks have a lot of food sources. They are not picky eaters and spend a lot of time searching for their next meal, including at bird feeders. They are omnivores and love nuts, berries, seeds, mushrooms, insects, frogs, lizards, baby birds, and bird eggs. During late summer and fall, they begin carrying extra food back to their burrow in their ample cheek pouches (which can hold a stash three times the size of their head). This foraging also benefits the larger ecosystem ---chipmunks spread seeds and important mycorrhizal fungi that live around tree roots, ensuring they thrive.

The eastern chipmunk typically hibernates in the winter, while western chipmunks do not, relying on the stores in their burrows.

Baby Chipmunks (called kits, kittens, or pups) are born blind, hairless, and helpless. Pups develop quickly, and leave the nest by 4 to 6 weeks of age to make their own way in the world.

Despite their reputation for cuddly camaraderie in cartoons, chipmunks are mostly solitary creatures, at least until breeding season arrives. Twice a year in spring and late summer, males (called bucks) and females (does) come together to mate, then part ways again. Female chipmunks raise the pups, but don't remain close to their offspring once they leave.

Chipmunks do have a sizable vocal repertoire, announcing everything from territorial claims to terror over nearby predators. Vocalizations include chips, chucks, and trilling alarm calls. In fact, chipmunks are so talkative, and their high-pitched communications are so ubiquitous, many people mistake them for bird calls.

AShortGuidetoChipmunkNoises|National Geographic: https://www.youtube.com/ watch?v=ESJaPmfbius&t=2s

**RESOURCES:** 

https://en.wikipedia.org/wiki/ Chipmunk https://www.treehugger.com/ things-you-dont-know-aboutchipmunks-4864283



© Brad Zimmerman, Photographer

# **BRINGING AWARENESS TO CHIPMUNKS**

#### by Brad Zimmerman

For the past four years I have dedicated my life to bringing attention and awareness to chipmunks.

People always ask me how can you distinguish one chipmunk from another. First of all, every chipmunk's tail is different. If you look closely at the chipmunk's tail you will see distinct differences in the shape and size of their tails. Each chipmunk also has a unique personality.

As I built relationships with more chipmunks I was surprised to see how different each chipmunk's personality was. After feeding several of them I was able to identify them by how they approached me. The easiest way to tell chipmunks apart though is to know where they live. Chipmunks are solitary animals and will protect their burrow with their lives. It is always best if you decide to feed a chipmunk to find out where it lives and feed them about 10 feet away from their homes. By doing this the chipmunk won't have to travel out into the open where predators can get him.

Chipmunks also rely on birds heavily for their safety. They know if song birds are out chirping it is safe for them to come out. If there was an owl or a hawk present, the birds would be quiet. Blue jays are chipmunks eyes in the sky. If you hear a blue jay's call you will see the chipmunks take cover quickly.

My most favorite discovery about chipmunks are their amazing cheeks. A chipmunk's cheeks works like a pouch, so when they find a food source they are able to gather as much as possible on one trip. I have been amazed at how much a chipmunk can fit into their cheeks. I have learned that with practice their cheeks can carry more and more over time.

Another unique feature chipmunks have is their noses tuck in. Since chipmunks prefer subterranean living (living underground), they are constantly digging and their noses are tucked in so they don't get dirt in there. Their noses are bright pink when they flip their noses up. I have learned that when a chipmunk is excited they will turn their little noses up.

If you decide you want to feed a chipmunk giving them peanuts and sunflower seeds and corn would be okay. But feeding them nuts with too many carbs could be harmful. but to many nuts with carbs can be harmful for them. Hazel nuts and walnuts are excellent choices.

Then in the fall, if you bring them acorns you will help them make it through winter. The acorns will stay fresh for the three months while they hibernate and give them a food source. Chipmunks wake up every few days when they hibernate to eat something.

In closing, what I have learned about chipmunks in just four years has amazed me. I learn something new each day. Chipmunks are amazingly smart animals and I look forward in the future to sharing personal stories of my relationships with my chipmunks.

FOR MORE INFORMATION / SEE MY VIDEOS: https://www.instagram.com/chipmunksoftiktok/

# **DISCOVERING NATURE**

#### GETTING INVOLVED IN MARINE CITIZEN SCIENCE PROJECTS IN NEW YORK STATE

Files digital survey from a smartphone or computer.

https://www.dec.ny.gov/animals/108573.html https://www.dec.ny.gov/animals/112355.html https://survey123.arcgis.com/ share/61d5dd933ae94b69b4c40e89bc701f03

#### **River Herring and American Eel Monitoring**

DEC works with Peconic Estuary Partnership (PEP), Seatuck Environmental Association, Long Island Sound Study (LISS), and volunteers to monitor local waterways for river herring and American eels. Visit Seatuck's website to review the online survey, and learn more about how you can volunteer by visiting PEP's website for training videos and additional resources.

https://www.peconicestuary.org/ https://seatuck.org/ https://seatuck.org/volunteer-river-herring-survey/ https://www.peconicestuary.org/what-you-can-do/education-andoutreach-programs/

#### Artificial Reef Fishing & Diving Survey

The Artificial Reef Program is looking for volunteer anglers and divers to record and share their catches and marine life observations while visiting New York's artificial reefs. If you visit one of New York's artificial reefs, submit your observations using the Artificial Reef Volunteer Fishing & Diving Survey. Before visiting a reef, be sure to check out DEC's Artificial Reef Guide (PDF) and Artificial Reef Interactive Map.

https://www.dec.ny.gov/outdoor/7896.html https://survey123.arcgis.com/ share/22f4af7a3ef241abadf2d51e4eb69560 https://www.dec.ny.gov/docs/fish\_marine\_pdf/dmrreefguide.pdf https://nysdec.maps.arcgis.com/apps/webappviewer/index. html?id=dd55f0e62c8e4ad195afee458417934d

#### Atlantic Sturgeon Salvage Program

Atlantic sturgeon are anadromous, meaning they're born in freshwater and spend most of their lives in the ocean but return to freshwater regions to spawn. Sturgeon may wash up on Long Island beaches or in the Hudson River region, and DEC asks individuals to report any sturgeon they may come across.

- In marine waters, including Long Island Sound, call 631-444-0444 or email us. MarineProtectedResources@dec.ny.gov
- In the Hudson River region, call 845-256-3073 or email *HudsonRiverFish@dec.ny.gov*

#### **RESOURCES:**

https://content.govdelivery.com/accounts/NYSDEC/bulletins/2c677c0

## THE DELAWARE VALLEY EAGLE ALLIANCE

working towards the conservation of our wildlife and natural resources

The Delaware Valley Eagle Alliance is a 501 (C)(3) not-forprofit organization with a mission to increase awareness, understanding and promote conservation of our wildlife and the natural environment. We accomplish this through our publications, projects and programs.

We believe that raising awareness and understanding will change attitudes toward conservation and our natural resources.

John A. DiGiorgio, Chairman and President Richard Crandall, Director and Vice President Yoke B. DiGiorgio, Director and Treasurer Debra Reimer, Secretary

### THE NATURE'S NEWSLETTER

Is dedicated to facilitating the free access and exchange of information of critical issues in the world today; to educate, inspire and empower all to take part and take action to enable all life to exist and prosper on Earth.

#### **PROJECTS AND PROGRAMS**

We are available to work closely with biologists and conservation groups to document ecological and wildlife research on sensitive and endangered wildlife and environmental issues.

We collaborate with communities and other organizations to develop and organize wildlife and environmental educational and entertaining programs.

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