Protect Our Species

Earth Day 2019

Primer and Action Toolkit

EARTH DAY NETWORK

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Produced by Earth Day Network for the Protect Our Species Campaign, 2019

This toolkit was last updated February 15th, 2019. For more information, email species@earthday.org Designed and prepared by Valeria Merino, David Ayer, Austin Downs, and Jason Gooljar. Additional resources were created by many others working to fight against species loss. They are given credit and websites referenced when their work was incorporated into this toolkit, though we did not follow strict citation guidelines.

EARTH DAY NETWORK

About This Toolkit

Nature's gifts to our planet are the species that we know and love, along with the many more that we have yet to discover. Unfortunately, we have upset the balance of nature and the world is facing the greatest rate of extinction since we lost the dinosaurs more than 60 million years ago. But unlike the fate of the dinosaurs, the rapid extinction of species today is the result of human activity.

We are seeing an unprecedented rapid reduction of plant and animal wildlife populations that is directly linked to human activity, from climate change, deforestation, habitat loss, trafficking and poaching, unsustainable agriculture, pollution, and pesticide use. The impacts are far-reaching and we must take action now to Protect our Species.

Earth Day Network is committed to being a part of the solution and we are calling on you to help us. Get started with our Protect our Species Primer and Action Toolkit .

Throughout this toolkit, you will find out about species in need of protection and conservation efforts, and ways you personally can minimize your disturbance on the welfare of other species. Guidelines for interacting with plant and animal wildlife can vary drastically by location, and we have done our best to include advice and recommendations that are applicable across the globe. We urge you to find out more about local environment and become involved with your community. In efforts to Protect our Species.

DO YOU KNOW ABOUT WHAT IS HAPPENING TO NUMEROUS SPECIES?

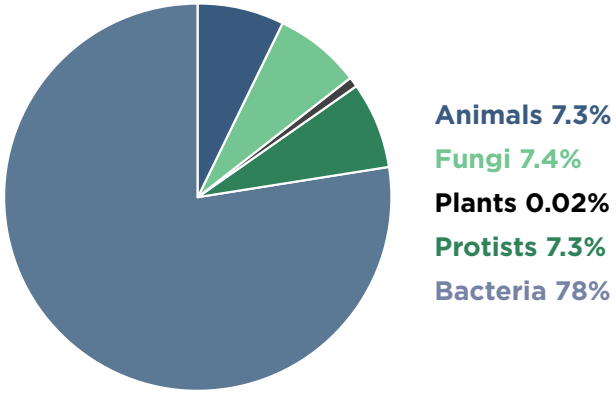
Do you remember growing up and seeing a certain type of plant or animal that you don't see anymore? Do you go on trips into nature only to find less wildlife than you remember from previous visits? If you are in tune with the plants and animals living around us, you might have noticed their numbers are shrinking or disappearing.

Around the world, populations of species of plants and animals are shrinking and going extinct at a faster pace than ever before. As human populations expand into existing habitats, they displace the plants and animals living there. Additionally, our contributions to global warming and our proclivity for ever increased hunting and fishing have also caused a tremendous burden on the other organisms with which we share the planet.

The Fascinating Species on Our Planet

Everywhere you go on our planet, there is something alive around you! If you pay a bit of attention, whether in a city or the countryside, you will almost always see a tree, a plant, a bird, an insect...some form of life. Furthermore, any person who has watched a TV program about nature, read a nature magazine, visited a zoo or aquarium, or enjoyed a walk in the outdoors, has probably noticed the immense variety of plants and animals that surround us.

Our planet is truly thriving with living things. Some we are familiar with and others we have never heard of. There are so many! And estimates keep changing. "Scientists generally agree that many more species exist than are formally described, but they disagree about how many there really are. The most recent study, published in 2017, estimates that there are roughly 2 billion living species on Earth, over a thousand times more than the current number of described species."[1] The graph below shows a breakdown of those species.



Brendan B. Larsen, Elizabeth C. Miller, Matthew K. Rhodes, John J. Wiens. Inordinate Fondness Multiplied and Redistributed: the Number of Species on Earth and the New Pie of Life. The Quarterly Review of Biology, 2017; 92 (3): 229 DOI: 10.1086/693564

Yes, that is right! A majority of them are bacteria.

The species sharing this planet range from large marine mammals such as whales and dolphins, to small land mammals such as country mice; from the fish we eat in our meals to the incredible deep sea creatures that glow in the dark and look to be straight from horror movies.

They range from the song birds that wake us up in the morning and the crows and vultures that take care of the remains of dead animals, to the amazing insects that live in complex colonies of thousands of individuals and the bacteria that exist in our guts. We hardly ever think about most of the world's species and even more of them we will never get to see.

The natural world is an amazing and complex web of life in which every species has a role to play, interrelated with everything else that exists. Every single species evolved to be what it is for a biological reason. Each one occupies a particular niche in the grand scheme of life and is needed by other species to thrive and survive.

Simply put, we still know quite little about the myriad of species that inhabit the planet with us. It takes years of research and studies and quite a lot of funding to discover a new species and figure out how they live and relate to those around them. It takes time and dedication to understand how one species fits into their ecosystem and the possible impacts of their disappearance. Hence, it is extremely concerning that we are losing species before science has the chance to find out how important they really are!

ADDITIONAL RESOURCES:

ARTICLES/BLOGS/READINGS

Planet Earth is Home to 8.7 Million Species, Scientists Estimate - *The Guardian*

https://www.theguardian.com/environment/2011/aug/23/species-earth-estimate-scientists

This article showcases one of the most accurate estimates of life on earth, published in 2011.

$5bn project to map DNA of every animal, plant and fungus - *The Guardian*

https://www.theguardian.com/science/2018/nov/01/5bn-project-to-map-dna-of-every-animal-plant-and-fungus

An article documenting the Earth Biogenome Project's efforts to map the DNA of over 1.5 million species.

VIDEOS

Our World's Largest Rainforest: The Amazon - *World Wildlife Fund*

https://www.youtube.com/watch?v=bYAZ3NWVgtc

The Amazon is the world's largest rainforest. It is home to more than 30 million people and one in ten of the known species on Earth. See some of this region's splendor in this video.

Bird Of Paradise Courtship Spectacle | Planet Earth - *BBC Earth*

https://www.youtube.com/watch?v=nWfyw51DQfU

Deep in the forests of New Guinea there is a rich variety of life, each species more bizarre than the last. One such spectacle is the male Bird of Paradise who appears to go to extraordinary lengths to attract a mate.

Phylogeny - *Khan Academy*

https://www.khanacademy.org/science/high-school-biology/hs-evolution/hs-phylogeny/v/taxonomy-and-the-tree-of-life

A great resource if you want to learn more about the great web of life and all the species with whom we share the planet.

The Strange Animals of Asia – *National Geographic*

https://www.youtube.com/watch?v=88-JKzAebLo

Take a trip to Asia with National Geographic and be amazed by the diverse wildlife from the Clouded Leopard to the Yin Yang Frog.

STORYTELLING

How to Discover a Brand New Life Form - *BBC*

http://www.bbc.com/earth/story/20150119-how-to-discover-a-new-species

There are millions of unknown species still to be discovered, and if you follow these tips you could find one of them!

OTHERS WORKING ON THIS

Earth Biogenome Project

https://www.earthbiogenome.org/

The home page of the Earth Biogenome Project, an ambitious endeavor to map the DNA of 1.5 million different species.

REPORTS

Introducing IPBES' 2019 Global Assessment Report on Biodiversity and Ecosystem Services - *IPBES*

https://www.ipbes.net/news/ipbes-global-assessment-preview

The Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES) is an independent intergovernmental body established to strengthen the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development.

A definitive new global synthesis of the state of nature, ecosystems and nature's contributions to people — the first such report since the landmark Millennium Ecosystem Assessment published in 2005, and the first ever that is inter-governmental — will be presented to representatives of 132 Governments for consideration of approval in May 2019.

Strategic Plan for Biodiversity 2011-2020 - *The Convention on Biological Diversity*

https://www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf

Biological diversity underpins ecosystem functioning and the provision of ecosystem services essential for human well-being. It provides for food security, human health, the provision of clean air and water; it contributes to local livelihoods and economic development and is essential for the achievement of the United Nations' Millennium Development Goals, including poverty reduction. In addition, it is a central component of many belief systems, worldviews and identities. Yet despite its fundamental importance, biodiversity continues to be lost. It is against this backdrop that the Parties to the Convention on Biological Diversity, in 2010 in Nagoya, Japan, adopted the Strategic Plan for Biodiversity 2011-2020 with the purpose of inspiring broad-based action in support of biodiversity over the next decade by all countries and stakeholders. In recognition of the urgent need for action the United Nations General Assembly has also declared 2011-2020 as the United Nations Decade on Biodiversity.

Quick Guides for the Aichi Biodiversity Targets - *The Convention on Biological Diversity*

https://www.cbd.int/nbsap/training/quick-guides/

This set of guides for the Aichi Biodiversity Targets aims to provide an introduction to each of the Aichi Biodiversity Targets by quickly explaining key terms, highlighting implications for national target setting, providing guiding questions for national target setting, providing ideas for preliminary national actions, identifying possible indicators to monitor progress and identifying further resources.

What Is Happening to the Species on our Planet?

A vast number of animals and plants have gone extinct in recent centuries due to human activity, especially since the industrial revolution.[2] Many others are in serious decline and threatened with extinction, which affects genetic variation and biodiversity, among other issues.

The number of land animals has fallen by 40% since 1970.[3]

Animal populations in freshwater ecosystems have plummeted by 75% since 1970.[6]

In the same time period, marine animal populations have also fallen by 40%.[4]

Insect populations have declined by 75% in some parts of the world.[7]

It is estimated that humans have impacted 83% of Earth's land surface, which has affected many ecosystems as well as the range in which specific species of wildlife used to exist.[9]

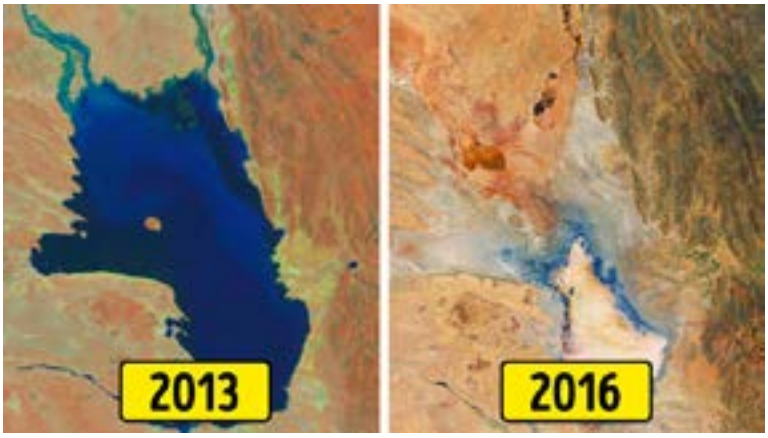
40% of the world's 11,000 bird species are in decline.[5]

About a quarter of the world's coral reefs have already been damaged beyond repair, and 75% of the world's coral reefs are at risk from local and global stresses.[8]

THE FACE OF THE PLANET IS CHANGING VERY FAST

All around the world, in areas where humans exploit natural resources or development occurs, we witness the same outcome: a deteriorating natural environment that affects other species.[10]

Many of us have seen images depicting open prairies covered by massive herds of bison, or enormous flocks of birds congregating in marshes and lagoons and beautiful and iconic animals such as elephants, giraffes, and whales are now in danger of becoming extinct.



Poopó is Bolivia's second-largest lake and has always been an important fishing resource for its local people. Now Poopó has essentially dried up because of mining and agriculture. It is interesting that this is not the first time that the lake has evaporated. The last time Poopó dried up in 1994, it took several years for water to return, and even longer for ecosystems to recover.

Graphic from http://tinyurl.com/y3sjklmx

You may have noticed that you no longer hear the sound of thousands of frogs croaking in the middle of the night, birds visiting a backyard feeder, or bats flying to their resting place at dusk.

If you live close to the ocean you have probably noticed fish stocks are in decline or seen whales, dolphins, and other marine mammals washing up dead on beaches.[11]

In the last decades, we have learned of countless new plant and animal species being discovered in tropical forests across the globe, giving us a sense of wonder and possibility. At the same time, millions of acres of forest are being destroyed every year.

Many species have disappeared already and many more are following the same path. As reported by The International Union for the Conservation of Nature (IUCN), there have been 849 species that have disappeared in the wild since 1500 A.D.; most strikingly, this number greatly underestimates the thousands of species that have disappeared before scientists were able to identify them.[276] Most troublingly, around 33% of amphibians and 20% of mammals are in danger of becoming extinct in the coming decades.[277] More recent estimates predict an even larger rate of loss.

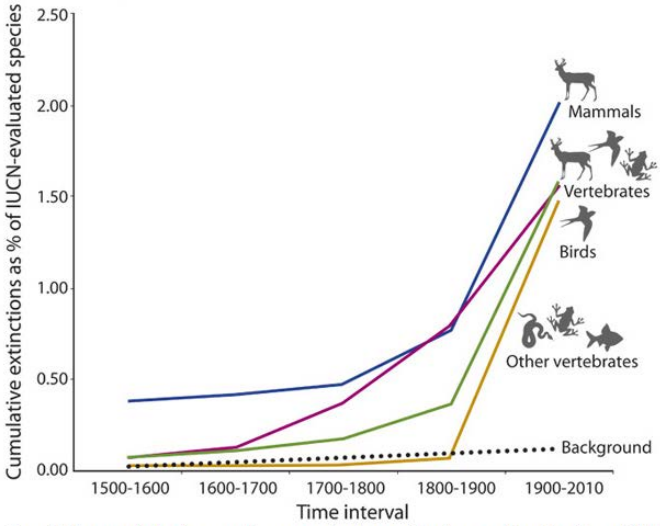
Developed nations have seen benefits in economic growth from the exploitation of their own ecosystems and species as well as those of developing nations.[12] The biggest declines we are seeing now in plant and animal populations are happening in low-income, developing nations, mirroring declines in wildlife that occurred in wealthier nations long ago. The last wolf in the UK, for example, was killed in 1680.[13] Developed countries now exploit the resources of the developing world to continue their growth. Between 1990 and 2008, around a third of the world's timber, beef, and soya – products whose harvest causes deforestation globally – were imported by the EU.[14]

WE ARE FACING A NEW MASS EXTINCTION

Academics and others debate if we are already facing a new process of mass extinction, such as those the world has experienced over the millennia. But even if that is not the case, we know that thousands of species are endangered, and most flora and fauna, from land and sea, have seen their numbers severely reduced.

Some argue that species have disappeared before and that the current decline is just part of a natural cycle. But this conclusion is inaccurate. All other processes of global mass extinction in the history of the planet happened because of a catastrophic natural event. However, none of them were the result of human intervention, as is the case for the current period of mass extinction.

According to Peter Ward from the University of Washington, what we are experiencing today is strikingly similar to the dinosaur-killing event of 65 million years ago, when a planet already stressed by sudden changes in its climate was knocked into mass extinction by the impact of asteroids.[15] The mass extinction we are going through has been unfolding because of the intervention of a single species: homo sapiens. Humans have had an outsized negative impact on most other species around the world. Human activity has caused a dramatic reduction in population sizes and in the total number of species; thousands have already disappeared and many more are threatened with extinction.



Cumulative vertebrate species recorded as extinct or extinct in the wild by the IUCN (2012). Graphs show the percentage of the number of species evaluated among mammals (5513; 100% of those described), birds (10,425; 100%), reptiles (4414; 44%), amphibians (6414; 88%), fishes (12,457; 38%), and all vertebrates combined (39,223; 59%). Dashed black curve represents the number of extinctions expected under a constant standard background rate of 2 E/MSY. Conservative estimate. Image and caption courtesy of Ceballos et al (2015)

Graphic from http://tinyurl.com/y4ufjlow

The marine extinction crisis is not as widely grasped as the crises in tropical forests and other terrestrial biomes.[16] We do not know how many species are in the ocean because the bulk of marine species have yet to be discovered. Therefore, we do not know how many have disappeared or how many are in danger of disappearing.

While we know overfishing is a major global concern, current assessments cover only 20% of the world's fish stocks, so the true state of most of the world's fish populations is not known. With this in mind, recent findings suggest that those unstudied stocks are declining[17] and that nearly three-quarters of the world's commercially fished stocks are overharvested and at risk.

THE LOSS OF A SPECIES IS IRREVERSIBLE

We are seeing irreversible biodiversity loss as a result of species extinction, the devastation of genetically unique populations, and the loss of their genetic variation.[18] The evidence all points to the unfolding of a global tragedy with permanent consequences.[19]

When a species goes extinct, it dissappears from its ecosystem, leaving ripple effects on the species left behind. The Dodo Bird, a now extinct species that once lived on the island of Mauritious was driven to extinction by human activity. Now, only 13 individuals of a species of tree native to the island exist. When the Dodo bird went extinct 300 years ago, they stopped consuming the fruit of these trees. By passing through the digestive system of the birds the seeds were activated and able to grow. It is no coincedence that the few remaining trees on the island stopped reproducing at the same time as the Dodo went extinct.[20]

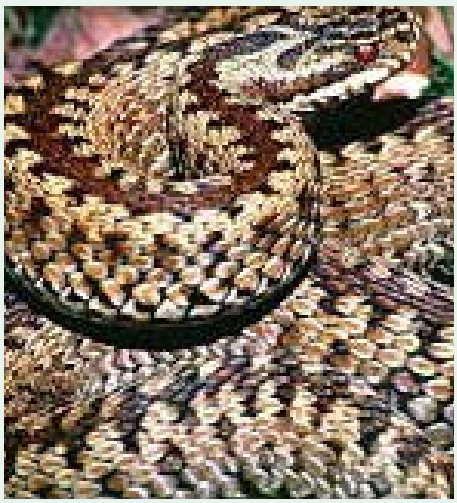
Raphus cucullatus (Dodo)

Became extinct in 1662
Driven to extinction: Who killed the Dodo?
The Smart, Agile, and Completely Underrated Dodo

WHAT DOES THIS MEAN?

- Many species are facing extinction. This process has accelerated since humans started developing large-scale agriculture and clearing more and more wild habitat.
- There are widespread population declines among many species of animals or plants due to a number of different factors.
- Many species have found their populations isolated and fragmented by development. Individuals once roamed large expanses of territory and had endless mating choices. Now, fragmentation of habitat through human development has lead to inbreeding within much smaller, isolated populations. This inbreeding within small populations of a species may lower the population's ability to survive and reproduce, a phenomenon called inbreeding depression.
- As species populations dwindle, they lose genetic variation. Individuals of a species have similar characteristics, but small genetic variations arise over many, many generations. If a species loses a significant portion of its population, it also loses genetic diversity. Even if that species is able to quickly rebound in population size, its level of genetic variation will remain low, until mutation variations redevelop over future generations. For this reason, an endangered species with low genetic variation may be at risk of extinction long after its population size has recovered.[21]
- Species with small, specialized populations that live in limited territories are threatened by habitat encroachment and a changing climate.

INBREEDING DEPRESSION



"A population of 40 adders (a kind of snake -Vipera berus-, shown in the photo) experienced inbreeding depression when farming activities in Sweden isolated them from other adder populations. Higher proportions of stillborn and deformed offspring were born in the isolated population than in the larger populations. When researchers introduced adders from other populations — an example of outbreeding — the isolated population recovered and produced a higher proportion of viable offspring."[22]

ADDITIONAL RESOURCES:

ARTICLES/BLOGS/READINGS

The Extinction Crisis – *Center for Biological Diversity*

http://bit.ly/2SRlX89

In the past 500 years, we know of approximately 1,000 species that have gone extinct, including the woodland bison of West Virginia, Arizona's Merriam's elk, the Rocky Mountain grasshopper, the passenger pigeon, and Puerto Rico's Culebra parrot. This doesn't account for the thousands of species that disappeared before scientists had a chance to describe them.

Loss of Biodiversity and Extinction – *Anup Shah*

http://bit.ly/2GEUZtI

The author of this article presents a comprehensive overview of the negative role humans have played in accelerating biodiversity loss and, ultimately, the extinction of numerous species. Additionally, the article presents a summary of how people, governments, and international institutions have responded to the growing threat of species loss and the overall success of our collective efforts.

Species Extinctions: the Facts – *International Union for Conservation of Nature*

http://bit.ly/2Bvr4ks

The rapid loss of species we are seeing today is estimated by experts to be between 1,000 and 10,000 times higher than the "background" or expected natural extinction rate (a highly conservative estimate). Unlike the mass extinction events of geological history, the current extinction phenomenon is one for which a single species — ours — appears to be almost wholly responsible.

VIDEOS

Extinction of Species | Biology for All – *FuseSchool*

https://www.youtube.com/watch?v=jphrpR9ffKA

This informational video provides a great introductory explanation to the differences between natural and human-made species extinction. In closing, the video highlights the current warning signs of another mass extinction.

To Save A Fox, Scientists Took To Land, Air And Sea – *NPR*

https://www.youtube.com/watch?time_continue=1&v=2AVRSGkartg

If you want to see a wild island fox, you have to visit the remote Channel Islands off the coast of Southern California. This special species doesn't live anywhere else. This is the story about how it was saved.

STORYTELLING

Galapagos Giant Tortoises Make a Comeback, Thanks to Innovative Conservation Strategies – *The Conversation*

https://theconversation.com/galapagos-giant-tortoises-make-a-comeback-thanks-to-innovative-conservation-strategies-67591

As many as 300,000 giant tortoises once roamed the Galapagos Islands. Whalers and colonists started collecting them for food in the 19th century. Early settlers introduced rats, pigs and goats, which preyed upon tortoises or destroyed their habitat. As a result, it was widely concluded by the 1940s that giant tortoises were headed for oblivion. Not any more!

Smithsonian Study Reveals Decline of Genetic Diversity in Wild Cheetahs - *Smithsonian*

https://insider.si.edu/2016/06/smithsonian-study-reveals-precipitous-decline-genetic-diversity-wild-cheetahs/

The story of how wild cheetahs — one of the world's most iconic cats — are losing genetic diversity rapidly.

REPORTS

Biodiversity Generation and Loss - *T.H. Oliver*

http://oxfordre.com/environmentalscience/view/10.1093/acrefore/9780199389414.001.0001/acrefore-9780199389414-e-96

Human activities in the Anthropocene are influencing the twin processes of biodiversity generation and loss in complex ways that threaten the maintenance of biodiversity levels that underpin human well-being. Yet many scientists and practitioners still present a simplistic view of biodiversity as a static stock rather than one determined by a dynamic interplay of feedback processes that are affected by anthropogenic drivers.

The Faces of Species Loss

In order to take action to protect species, the world's governments, scientists, and conservation organizations need a system to identify species that are under threat and define the seriousness of the threat they are facing. The International Union for the Conservation of Nature (IUCN) is the global authority on the conservation status of species. It has developed a list, "The IUCN Red List of Threatened Species", which is updated on an ongoing basis.

IUCN classifies species status in the following categories:

- **EXTINCT (EX)**
- **EXTINCT IN THE WILD (EW)**
- **CRITICALLY ENDANGERED (CR)**
- **ENDANGERED (EN)**
- **VULNERABLE (VU)**
- **NEAR THREATENED (NT)**
- **LEAST CONCERN (LC)**
- **DATA DEFICIENT (DD)**

Classification is determined on the basis of five criteria: rate of decline of the population, geographic range of the population, the total size of the population, restrictions on the population, and the likelihood of extinction.[23]

IUCN's classifications do not automatically convey any level of protection to a species. The Red List is a scientific publication to inform governments and other legal bodies on the facts about each known species. Government entities or international bodies can then place threatened species under legal protections provided by existing laws or treaties. Classifying a species as threatened might also lead to the passage of a new policy or piece of legislation aimed at protecting that specific species.

For example, in the U.S., "before a species can receive the protection provided by the Endangered Species Act (ESA), it must first be added to the federal list of endangered and threatened wildlife and plants. The List of Endangered and Threatened Wildlife (50 CFR 17.11) and the List of Endangered and Threatened Plants (50 CFR 17.12) contain the names of all species that have been determined by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service (for most marine life) to be in the greatest need of federal protection."[24]

A species is designated under the Endangered Species Act when it is determined to be endangered or threatened because of any of the following factors:

- Present or threatened destruction, modification, or curtailment of its habitat or range;
- Overutilization for commercial, recreational, scientific, or educational purposes;
- Disease or predation;
- The inadequacy of existing regulatory mechanisms; or
- Other natural or man-made factors affecting its survival.

LET'S CHECK IN ON SOME SPECIES

EXTINCT SPECIES

Extinction occurs when there are no individuals left of a species. A species is extinct when there is no reasonable doubt that the last individual has died. Once this has happened there is no turning back and the extinct species is lost to the world forever.

Some species have also been classified as extinct in the wild. In this case, there may be a few individuals surviving in captivity. It is incredibly difficult, if not impossible, for a species to recover from being extinct in the wild.

The Spix's macaw (Cyanopsitta spixii)

Became extinct in the wild in 2018
Blue macaw parrot extinct in wild, study concludes

Northern White Rhino

Became extinct in 2018
This Picture of the Last Male Northern White Rhino Was One of the Most Important Photos of 2018

Passenger Pigeon

Became extinct in 1914
3 Billion to Zero: What Happened to the Passenger Pigeon?

Tasmanian Tiger

Became extinct in 1936
Why did the Tasmanian tiger go extinct?

THREATENED SPECIES

Before a species becomes extinct, it can be classified as threatened and potentially recieve protection. Threatened species — those closest to extinction — are classified by IUCN into Vulnerable, Endangered, and Critically Endangered.

Vulnerable Species

A species is classified as vulnerable if it is likely to become endangered and if threats to its survival and/or reproduction remain.

The Great White Shark (Carcharodon carcharias) is currently listed as vulnerable by IUCN.[25] "Found in cool, coastal waters throughout the world, there is no reliable data on the great white's population. However, scientists agree that their numbers are decreasing precipitously due to overfishing and accidental catching in gill nets, among other factors, and they are considered a vulnerable species."[26]

Endangered Species

A species is classified as endangered if it is very likely to become extinct under current conditions.

The Blue Whale (Balaenoptera musculus) is listed as Endangered on the IUCN Red List. "These gigantic creatures were almost whaled into extinction until they were declared protected by the International Whaling Commission in 1966. They are also protected under both the Endangered Species Act and the Marine Mammal Protection Act. This means that the blue whale is in danger of extinction throughout all or a significant portion of its range."[27]

Critically Endangered Species

A species is listed as critically endangered when there is an immediate and extreme risk of extinction if action is not taken right away.

Listed as Critically Endangered on the IUCN Red List, the **Javan rhino** (Rhinoceros sondaicus) is considered to be one of the most endangered large mammals in the world with only two populations existing in the wild, for a total number of less than 60 animals.[28]

ADDITIONAL RESOURCES:

ARTICLES/BLOGS/READINGS

Why the Passenger Pigeon Went Extinct – *Audubon*

https://www.audubon.org/magazine/may-june-2014/why-passenger-pigeon-went-extinct

Scientists believe they may have new insights into why passenger pigeons went extinct, after analyzing DNA from the toes of birds that have been carefully preserved in museums for more than a century. The last known passenger pigeon, Martha, lived at the Cincinnati Zoo until her death in 1914.

How the Western Black Rhino Went Extinct – *Scientific American*

https://blogs.scientificamerican.com/extinction-countdown/how-the-western-black-rhino-went-extinct/

West African black rhinos (Diceros bicornis longipes) were declared extinct in 2011, allthough the last one was sighted in 2006. Their population reduction was likely due to habitat loss and big game hunters that killed them for sport.

Why Are We Afraid of Sharks? There's a Scientific Explanation – *National Geographic*

https://news.nationalgeographic.com/2018/01/sharks-attack-fear-science-psychology-spd/

Sharks aren't the mindless killers that we have made them out to be.

These Creatures Faced Extinction. The Endangered Species Act Saved Them – *The Washington Post*

https://www.washingtonpost.com/news/animalia/wp/2017/03/11/eight-animals-saved-from-extinction-by-the-endangered-species-act/?utm_term=.28f55a80fada

VIDEOS

Conservation and the Race to Save Biodiversity – *California Academy of Sciences*

https://www.khanacademy.org/science/high-school-biology/hs-ecology/hs-human-impact-on-ecosystems/v/conservation-and-the-race-to-save-biodiversity

Different approaches to conservation and how they can protect species and habitats.

REPORTS

Effects of Fish Extinctions on Ecosystems – *European Commission*

http://ec.europa.eu/environment/integration/research/newsalert/pdf/73na2_en.pdf

Nitrogen and phosphorus are crucial nutrients in aquatic ecosystems because most organisms at the bottom of the food chain rely on them. Considering that the recycling of nutrients is directly influenced by fish, an American team of scientists has recently investigated the impacts of fish extinction on the nutrients recycling process.

What Is Causing this Extinction Process?

OVEREXPLOITATION OF SPECIES

Food: Since the dawn of the human species, we have relied on plants and other animals for food. As the human population skyrocketed, this consumption quickly became unsustainable. We have overfished our waters and hunted many species of animals to extinction. It is unlikely that humans will ever stop consuming other animals completely, but it is entirely possible for us to consume them in a sustainable way.

Labor: Humans have used animals as laborers and entertainment for thousands of years, often causing them harm. Elephants, for example, are taken from their natural habitat to carry cargo or perform for tourists or being part of a circus. These animals are usually subjected to inhumane treatment until they submit to commands.

Illegal wildlife trade: Illegal hunting — known as poaching — and illegal trade of wildlife products is a major direct threat to the future of many of the world's most threatened species. Not all wildlife trade is illegal but determining if wildlife products were illegally sourced is a challenge for authorities. The desire for products made of Giraffe skin has been one of the major drivers of that species' decline. Elephants, rhinos, pangolins, tigers, turtles, birds, and hundreds of other animal species face harm and potential extinction because of illegal poaching. Plants, are also widely traded in less than legal markets. Orchids, for example, are broadly covered by the Convention on International Trade in Endangered Species of Wild Flauna and Flora (CITES), making it illegal to trade orchids internationally without CITES permits yet international trade of wild orchids continues.[29]

HABITAT LOSS[30]

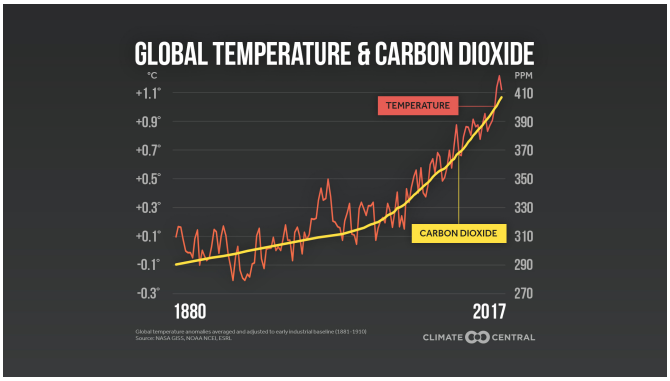
Habitat destruction: A bulldozer pushing down trees is the iconic image of habitat destruction. Other ways people directly destroy habitat: filling in wetlands, dredging rivers, mowing fields, and cutting down trees.

Habitat fragmentation: Much of the remaining terrestrial wildlife habitat has been cut up into fragments by roads and development. Aquatic species' habitats have been split up by dams and water diversions. These remaining fragments may be too small to support species that need larger territories to find mates and food. The loss and fragmentation of habitats also makes it difficult for migratory species to find places to rest and feed along their migration routes.

Habitat degradation: Habitats can become so degraded they can no longer support native wildlife, as a result of pollution, invasive species and disruption of ecosystem processes, such as the changing intensity of fires in an ecosystem. Recently, pesticide use has been recognized as another major cause of habitat degradation.[31] Heavy pesticide use in agricultural areas can leave downstream habitats dangerous for some species, especially certain invertebrates and plants.

CLIMATE CHANGE

As climate change alters the Earth's temperature and weather patterns, it also impacts plant and animal life. Scientists expect that the number, range, and variety of species will decline greatly as global temperatures continue to rise.[32]



Graphic from Climate Central

Deforestation, livestock, and the burning of fossil fuels for energy are some of the biggest contributors to global warming. Livestock accounts for between 14.5% and 18% of human-induced greenhouse gas emissions.[33] Those emissions come from cattle belches, flatulence, and waste; the fertilizer production for feed crops; general farm associated emissions; and the processes involved in growing feed crops.[34] Research conducted by the Worldwatch Institute's Nourishing the Planet Project also shows that animal waste releases methane and nitrous oxide, greenhouse gases that are much more potent than carbon dioxide. Research shows that a rise in income resutls in an increase in the consupmtion of meat and dairy products. The populations of industrial countries consume twice as much meat as those in developing countries.[35] Worldwide meat production has tripled over the last four decades and increased 20% in the last 10 years. This information suggests that we should cut back on our consumption of meat and dairy.

GLOBAL HOMOGENIZATION OF FLORA AND FAUNA[36]

Human actions, such as spreading non-native species, have increasingly driven evolution. This is known as the global homogenization of flora and fauna. Biotic homogenization is an emerging, yet pervasive, threat in the ongoing biodiversity crisis.[37] Originally, ecologists defined biotic homogenization as the replacement of native species by exotic or introduced species, but this phenomenon is now more broadly recognized as the process by which ecosystems lose their biological uniqueness and uniformity grows.[38] As global transportation becomes faster and more frequent, it is inevitable that species intermixing will increase. Unique local flora or fauna that become extinct are often replaced by already widespread flora or fauna that are more adapted to tolerate human activities. This process is affecting all aspects of our natural world. For example, 10 of the 12 original forest bird species have been lost due to the introduction of the brown tree snake.[39] Biological homogenization qualifies as a global environmental catastrophe. The Earth has never witnessed such a broad and complete reorganizat,ion of species distribution, in which animals, plants, and other organisms have been translocated on a global scale.

Over the last few centuries, humans have essentially become the top predator on land and across the sea. In doing so, humanity is using 25-40% of the planet's net primary production.[40] As we continue to expand our use of land and resources, the capacity of species to survive is constantly reduced.

Humanity has become a massive force in directing evolution. This is most apparent in the domestication of animals and the cultivation of crops over thousands of years. "We are directly manipulating genomes by artificial selection and molecular techniques, and indirectly by managing ecosystems and populations to conserve them,"[41] says Erle Ellis, an expert on the Anthropocene, with the University of Maryland.

OTHER

In countries around the world, policies have been enacted that have led to the extinction or near extinction of specific species, such as large predators in the U.S. and Europe. Chemical products, especially neonicotinoid pesticides, have been shown to harm bees and other pollinators. These chemicals have been linked to a phenomenon known as colony collapse disorder, where bees get seperated from their hives. The decline in bees poses a serious threat, as bees are responsible for pollinating much of the food we grow to feed ourselves and livestock. Without bees, the global food supply chain would be irreparably damaged.

ADDITIONAL RESOURCES

ARTICLES/BLOGS/READINGS

Worldwide Decline of the Entomofauna: A Review of its Drivers – *Science Direct*

https://www.sciencedirect.com/science/article/abs/pii/S0006320718313636

The biodiversity of insects is threatened worldwide. This study presents a comprehensive review of 73 historical reports of insect declines from across the globe, and systematically assesses the underlying drivers. This work reveals dramatic rates of decline that may lead to the extinction of 40% of the world's insect species over the next few decades.

How Does Climate Change Affect Biodiversity? – *Sciencing*

https://sciencing.com/climate-change-affect-biodiversity-23158.html

This article talks about the effects of climate change on the environment, land, and ocean biodiversity.

Ecological Footprint – *Footprint Network*

https://www.footprintnetwork.org/our-work/ecological-footprint/

This article gives background information on what an ecological footprint is.

Ways YOU Are Driving the Sixth Extinction of Species – *One Green Planet*

https://www.onegreenplanet.org/animalsandnature/how-you-are-driving-the-sixth-extinction-of-species/

This article talks about three daily behaviors that are contributing to species extinction and the ways we can change those habits for the better.

Politicians are Complicit in the Killing of our Insects – We Will be Next – *The Guardian*

https://www.theguardian.com/commentisfree/2019/feb/12/politicians-killing-insects-ecosystems

This article identifies current agri-business practices as a key driver towards this mass insect extinction: habitat loss and conversion to intensive agriculture with its associated use of pesticides.

Earth has Lost Half of its Wildlife in the Past 40 years, WWF – *The Guardian*

https://www.theguardian.com/environment/2014/sep/29/earth-lost-50-wildlife-in-40-years-wwf

This article highlights the devastation brought to wildlife from human activity, which has been reducing populations at an unsustainable rate.

How Humans are Driving the Sixth Mass Extinction – *The Guardian*

https://www.theguardian.com/environment/radical-conservation/2015/oct/20/the-four-horsemen-of-the-sixth-mass-extinction

This article warns of how human actions are currently causing a catastrophic sixth mass extinction.

Humans Are Just 0.01% of All Life But Have Destroyed 83% of Wild Mammals – *The Guardian*

https://www.theguardian.com/environment/2018/may/21/human-race-just-001-of-all-life-but-has-destroyed-over-80-of-wild-mammals-study

This article explores the impact of humans on the live of wildlife.

Climate Change Is Becoming a Top Threat to Biodiversity – *Scientific American*

http://bit.ly/2E62sQN

Climate change, along with land degradation and habitat loss, is emerging as a top threat to wildlife around the globe, several reports suggest. In Africa, it could cause some animals to decline by as much as 50% by the end of the century, and up to 90% of coral reefs in the Pacific Ocean may bleach or degrade by the year 2050.

VIDEOS

Can We Reverse Biodiversity Loss? – *Natural History Museum*

https://www.youtube.com/watch?v=YzXGT8majwc

Introducing an optimistic take on species loss, researchers at the Natural History Museum explain the steps that humans can take to slow down and even reverse the current trend of biodiversity reduction.

STORYTELLING

Elephants Were Dying and People Were Hungry. We Trained Poachers to Farm and Provided a Market Where There Was None – *Community Markets for Conservation*

https://www.itswild.org/our-story/

In the 1980s, wildlife populations in Zambia's Luangwa Valley were ravaged by poaching. It is estimated that within 20 years from the early 1970s to the early 1990s, elephant populations in this region dropped from 35,000 to 2,400. At the peak of the poaching epidemic 12,000 elephants were killed in one year. The black rhino, which had previously existed in healthy numbers in the Luangwa Valley, went locally extinct. The article suggests that instead of imprisoning poachers, we train them to farm, and provide a market for their crops.

Ecuadorian Province Protects 90% of its Land Area – *Mongabay*

https://news.mongabay.com/2017/03/new-conservation-area-established-in-the-ecuadorian-amazon-pastaza-region/

After three years of working with local governments and indigenous communities, the Provincial Council of Pastaza, in Ecuador, established the Pastaza Ecological Area of Sustainable Development

in the center of the Ecuadorian Amazon region. The area covers more than 2.5 million hectares (about 6.2 million acres) and occupies about 90% of the area of the province of the same name.

The Insect Apocalypse is Here – *New York Times*

https://nyti.ms/2GGdi1t

By one measure, bugs are the wildlife we know best, the non-domesticated animals whose lives intersect most intimately with our own: spiders in the shower, ants at the picnic, ticks buried in the skin. We sometimes feel that we know them rather too well. In another sense, though, they are one of our planet's greatest mysteries, a reminder of how little we know about what's happening in the world around us.

OTHERS WORKING ON THIS

Endangered Species Coalition

http://bit.ly/2tigd8H

The Endangered Species Coalition's mission is to stop the human-caused extinction of our nation's at-risk species, to protect and restore their habitats, and to guide these fragile populations along the road to recovery.

REPORTS

Causes and Consequences of Species Extinctions – *Navjot S. Sodhi et al.*

http://bit.ly/2RYBYEH

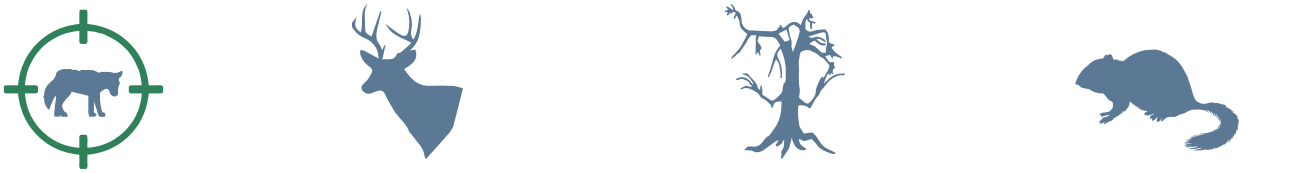
Although extinctions are a normal part of evolution, human modifications to the planet in the last few centuries, and perhaps even millennia, have greatly accelerated the rate at which extinctions occur. Extinctions can disrupt vital ecological processes such as pollination and seed dispersal, and lead to cascading losses, ecosystem collapse, and a higher extinction rate overall

Key Concepts Associated with the Process of Protecting Species

POPULATION LOSS:

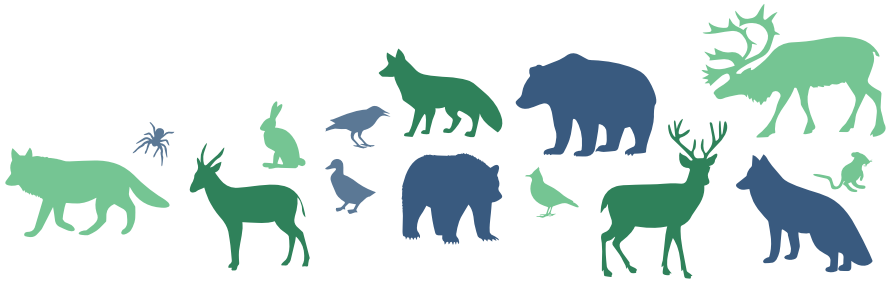
If you remember the concept of the interconnected ecosystem, you may be less surprised to learn that there are negative consequences from population loss long before a species becomes extinct, even before it is considered threatened. When a population falls, it is no longer able to keep up its important role in the ecosystem. This will have a domino effect that will destabilize other species in the same ecosystem.

Consequences of Population Loss in the North American Forest



Wolf populations severely reduced through hunting. = White tail deer populations (natural prey of wolves) grow rapidly = The massive deer population overeats the local vegetation = Other species that rely on vegetation for food and habitat suffer.

THE BIODIVERSITY IN THE NORTH AMERICAN FOREST



Diversity Loss

When population sizes shrink and species go extinct or are no longer present in a certain territory, one main worry is the loss of diversity. Diversity within a single species is called genetic diversity while diversity across multiple species is called **biodiversity**, and both are very important to maintain.

Why Is Genetic Diversity Important?

Genetic diversity is the variation in the genetic makeup across individuals within a species or population. It is important to the survival of the species population that this genetic diversity remains high. When pathogens and other threats to a species are faced, some individuals will be more resilient to the threats and thus more likely to survive. The more genetic diversity there is within a species or population, the more likely that it will have a higher number of individuals that will survive. If genetic diversity is too low, a single disease can wipe out the entire species.

Why Is High Biodiversity Important?

Having high biodiversity is important to an ecosystem as it is also increases its resiliency. More diverse ecosystems will respond better to challenges such as global warming as they are more likely to have species capable of adapting to the changes. More biodiverse ecosystems are also more productive, and more biodiverse forests absorb more carbon dioxide from the atmosphere.

ADDITIONAL RESOURCES

ARTICLES/BLOGS/READINGS

Accelerated Modern Human-Induced Species Losses: Entering the Sixth Mass Extinction – *Science Magazine*

http://advances.sciencemag.org/content/1/5/e1400253

This research article aims to assess whether human activities are causing a mass extinction by using extremely conservative assumptions. Their estimates show an exceptionally rapid loss of biodiversity over the last few centuries, indicating that a sixth mass extinction is already under way.

Loss of Biodiversity and Extinction – *Anup Shah*

http://bit.ly/2GEUZtI

The author of this article presents a comprehensive overview of the negative role humans have played in accelerating biodiversity loss and, ultimately, the extinction of numerous species. Additionally, it presents a summary of how people, governments, and international institutions have responded to the growing threat of species loss and the overall success of our collective efforts.

VIDEOS

The Importance of Biodiversity – *Kim Preshoff*

https://www.youtube.com/watch?v=GK_vRtHJZu4

Our planet's diverse, thriving ecosystems may seem like permanent fixtures, but they're actually vulnerable to collapse. Jungles can become deserts and reefs can become lifeless rocks. What makes one ecosystem strong and another weak in the face of change? To a large extent, it's biodiversity.

REPORTS

Multiple Functions Increase the Importance of Biodiversity for Overall Ecosystem Functioning – *Lars Gamfeldt et al.*

https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/06-2091.1

Biodiversity is important for how well an ecosystem functions. Most biodiversity–ecosystem function studies, however, consider only one response variable at a time, or examine multiple variables separately.

Smithsonian Study reveals Decline of Genetic Diversity in Wild Cheetahs – *Insider*

https://insider.si.edu/2016/06/smithsonian-study-reveals-precipitous-decline-genetic-diversity-wild-cheetahs/

The planet's last stronghold of wild cheetahs (Acinonyx jubatus) is losing genetic diversity at an alarming rate, according to a study from the Smithsonian Conservation Biology Institute (SCBI).

The reduction of genetic diversity in threatened vertebrates and new recommendations regarding IUCN conservation rankings – *Janna R. Willoughby, et al.*
https://www.sciencedirect.com/science/article/abs/pii/S000632071530032X

This report suggest a novel approach for identifying species in need of conservation by estimating the expected loss of genetic diversity.

BOOKS

Biodiversity – *E.O. Wilson*

Download for free here https://www.nap.edu/catalog/989/biodiversity

This important book for scientists and nonscientists alike calls attention to a most urgent global problem: the rapidly accelerating loss of plant and animal species to increasing human population pressure and the demands of economic development. Based on a major conference sponsored by the National Academy of Sciences and the Smithsonian Institution, "Biodiversity" creates a systematic framework for analyzing the problem and searching for possible solutions.

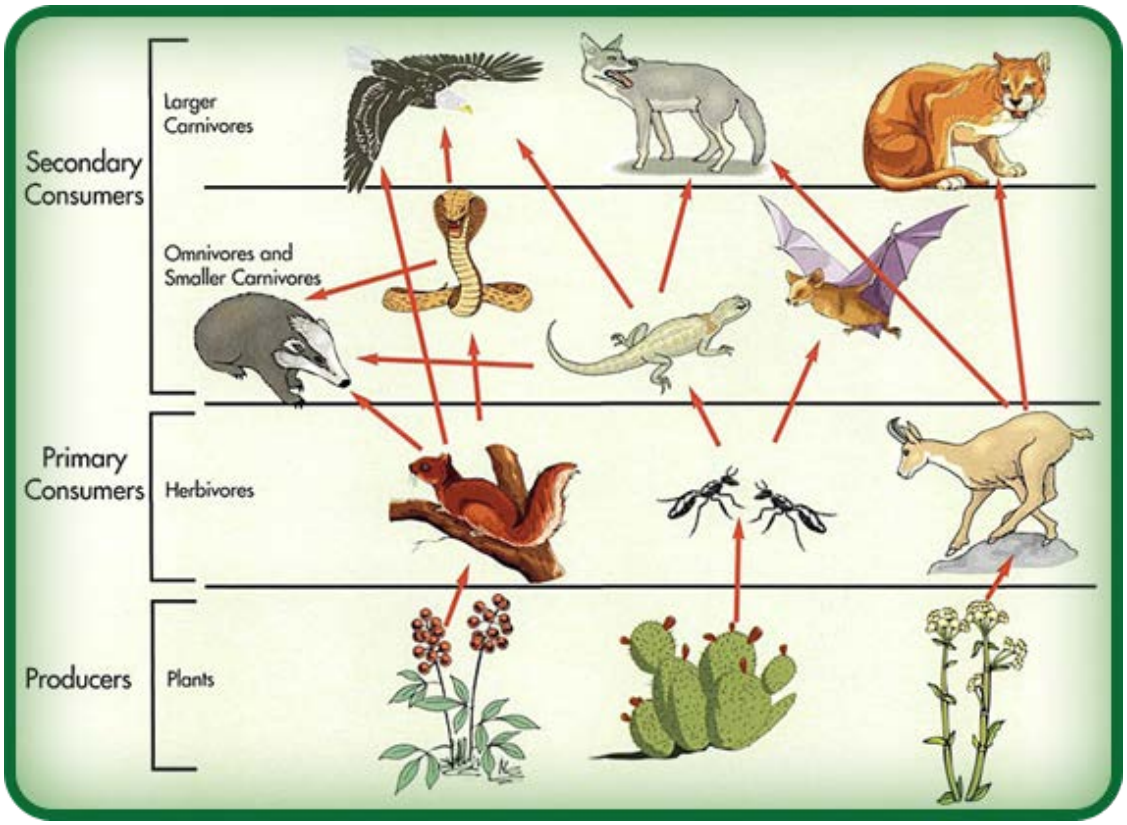
Why We Must Protect our Species

There are countless reasons why it is important to protect the huge variety of species on our planet. They have enormous value to humans, the other plants and animals in their ecosystems.

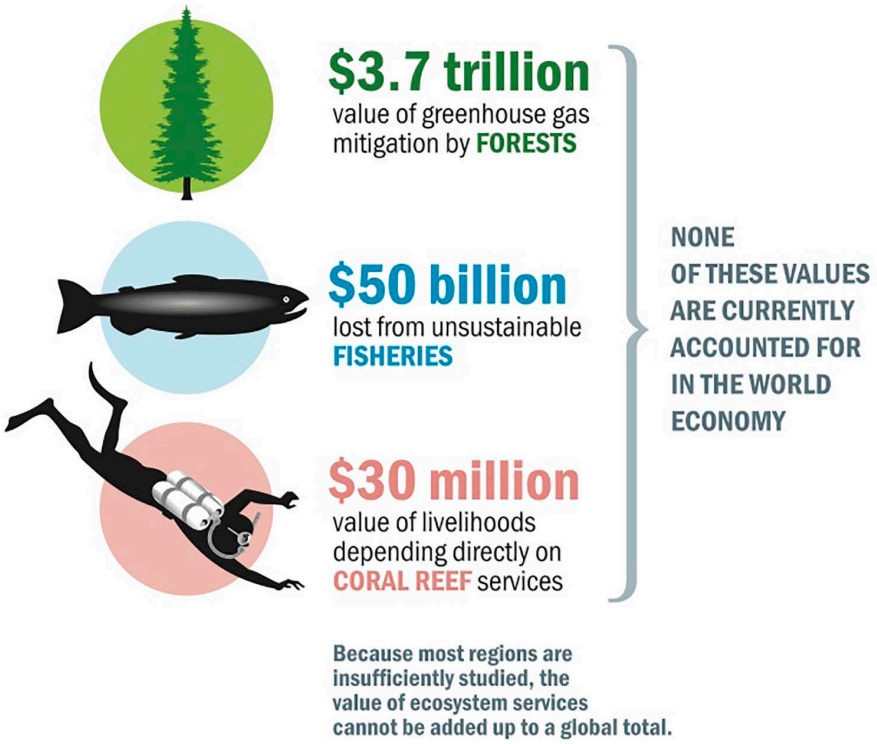
THE IMPORTANCE OF ECOSYSTEMS

You may have learned in a biology class that nature exists as a complex web of interactions. Diverse species depend on one another for countless things. Predators manage populations of prey, keeping them from growing out of control and consuming all of the ecosystem's resources. Scavengers and decomposers, help to clean the ecosystem, removing dead animals and plants, thus preventing disease. Every species has a specific role in its ecosystem. If the population of one species declines, it will no longer be able to perform its role and others in the ecosystem will be harmed as well. For this reason, we can't truly protect any one species without protecting all of the others.

ECOSYSTEM SERVICES



Source: Power Knowledge Life Science

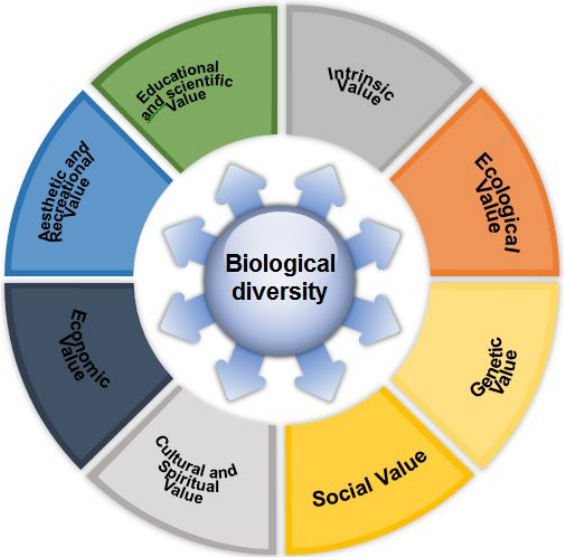


The Economics of Ecosystems and Biodiversity: 2010 Report

Human beings are a part of the global ecosystem as well. We have interacted with other plants and animals since we evolved as a species and we have come to rely on the many services provided to us by nature for our very survival. The great forests that wrap the equator of the world are its lungs. They absorb carbon dioxide and produce the oxygen we all rely on to breathe. Wetland areas filter toxins out of the water, preventing the oceans from being polluted by our activities. The countless variations of species evolution have provided us with inspiration for countless medical breakthroughs. The total economic value of all of these services has been estimated to be worth $44 trillion.[42] We need to protect the immense diversity of our planet so that it can continue to provide these essential services that we depend on to survive.

INTRINSIC VALUE

With all that can be said about the value of other species to the ecosystem and to us, it can sometimes make it easy to forget that these species also have intrinsic value purely by virtue of being alive. Every species on Earth is simply trying to survive and thrive on this planet, humans included. By what metric does any living thing have any more or less right to accomplish these goals than any other? If we assume that every living human has the right to live their life without harm from others, should we not extend this right to all other living things?



Source: Swaziland Environment Authority

ADDITIONAL RESOURCES

ARTICLES/BLOGS/READINGS

Does It Really Matter If Only One Species Goes Extinct? – *Forbes*

https://www.forbes.com/sites/grrlscientist/2018/10/13/does-it-really-matter-if-just-one-species-goes-extinct/#5599eb88610b

This article talks about how the loss of one species will also affect others.

Five Types of Ecological Relationships – *Sciencing*

https://sciencing.com/five-types-ecological-relationships-7786.html

These five types of interspecies ecological relationships will illustrate how interconnected all of the world's species are.

VIDEOS

Ecosystem Services – *California Academy of Sciences*

https://www.youtube.com/watch?v=BCH1Gre3Mg0

How is biodiversity essential to humans? We couldn't survive without it! Biodiversity helps supply us with food, shelter, medicine and so much more.

STORYTELLING

12 Remarkable Interspecies Relationships – *Dodo*

https://www.thedodo.com/12-remarkable-interspecies-rel-523336558.html

Depicts 12 heartwarming examples of unexpected friendships in the animal kingdom.

OTHERS WORKING ON THIS

A Manifesto for Earth – *Ted Mosquin and J. Stan Rowe*

http://www.ecospherics.net/pages/EarthManifesto.html

This Manifesto states self-evident truths, as obvious to us as our marvellous five-part environment — land, air, water, fire/sunlight, and organisms. The Manifesto is Earth-centered and shifts the value-focus from humanity to the enveloping Ecosphere — that web of organic/inorganic/symbiotic structures and processes that constitute Planet Earth.

REPORTS

Conservation Needs to Recognize Nature's Intrinsic Value, Researchers Say – *Oregon State University*

https://today.oregonstate.edu/archives/2015/feb/conservation-needs-recognize-nature%E2%80%99s-intrinsic-value-researchers-say

Conservation policies may reflect the practical benefits of nature — food, medicine, clean water and air. But in this issue of Conservation Biology, three scientists present a scientific and philosophical case for conserving nature on its own merits.

Does Nature Possess Intrinsic Value? An Empirical Assessment of American's Beliefs – *Jeremy T. Bruskotter et al.*

https://www.researchgate.net/publication/282283956_Does_Nature_Possess_Intrinsic_Value_An_Empirical_Assessment_of_American's_Beliefs

A summary of data from two recent studies to determine the prevalence of the belief that wildlife possesses intrinsic value, and determine what factors contribute to this belief.

What We Can Do to Protect our Species

Species protection is one of the oldest and most visible aspects of the broader environmental movement. Despite many notable success stories and instances where critically endangered species were pulled back from the brink of eradication, the phenomenon of the sixth extinction persists. Species continue to go extinct at an alarming rate, even with efforts by many governments and organizations to protect them. What is going on? What else needs to be done?

Some groups have targeted and protected specific species, such as the elephant and the tiger because they face considerable threats and impending extinction. Other efforts for conservation have focused on preserving the habitats with a high variety of different species to help sustain biodiversity. Other organizations and programs, many funded by governments, have determined their targets for conservation based on the ecosystems services involved. For example, the protection of forest land because forests contribute to clean air and filtered rain water.

While individual actions can be effective, we know now that conservation needs to be a part of all current and future development. Sustainable development needs to be at the core of humanity's future plan.

During the last half-century, we have learned that setting aside land for conservation or creating a conservation programs targeted on endangered species is not enough. The consumption of resources has been recognized as a root cause of biodiversity loss. Now, almost three decades after the United Nations Conference on Environment and Development (UNCED), also known as the Rio de Janeiro Earth Summit of 1992, people around the world have embraced the concept of sustainable development as the true path to save nature and the planet.

Indeed, the idea that we can keep growing economically while preserving the environment has been embraced with enthusiasm by governments, corporations, non-profits, and individuals.

Still, sustainable development as a concept has been difficult to turn into a reality. Governments, international organizations, and the private sector have not followed through on important commitments to the concept of sustainable development. We need to do more!

WHAT IS SUSTAINABLE DEVELOPMENT?

"Sustainable development is development that meets the needs of the present, without compromising the ability of future generations to meet their own needs."[44]

Humans have been incredibly resilient and resourceful. The core of humanity's successes can be attributed to looking at problems in new ways and finding innovative solutions. We can protect the planet's species if we rethink our development process.

We have known that we are the cause of many serious environmental problems, unless we make difficult decisions and examine our economic development process at its core, we might not be able to turn the tide.

Humans are unlikely to survive if we continue to destroy the other species on Earth. But we still have the chance to make changes and embrace new ways of doing things. We can save the planet and its species — and efforts to do so increase our overall well-being.

It is clear that we cannot protect any one species in an ecosystem without protecting the ecosystem itself. That is the key message behind the Protect our Species campaign. We cannot just protect the species we like or that we can visit during a trip to a national park. We cannot just protect the species that provide us with services. We must protect all species, because in the end, that is the one and only way to prevent more extinctions.

REDUCE OUR OVERALL CONSUMPTION:

We can consume less and be more mindful about what we consume. We need to leverage our purchasing power to help protect biodiversity by consuming products that do not harm the environment.

- We can choose products with ecolabels, which enable consumers to find products endorsed as green, safe, and environmentally sustainable.[43] Buying certified products helps protect nature.
- We can demand that supermarkets and other food providers purchase environmentally certified products.
- We can buy food from local farmers that we know, who have sustainable practices towards wildlife.
- We can buy organic and natural products when possible to support an industry that does not use pesticides and other chemicals known to harm wildlife.

"Ecolabelling is a voluntary method of environmental performance certification and labelling that is practised around the world. An ecolabel identifies products or services proven environmentally preferable overall, within a specific product or service category. There are different types of ecolabels"[45]

Many ecolabels and certification schemes are listed here http://www.ecolabelindex.com/ecolabels/

REDUCE YOUR USE OF ENERGY AND CONTRIBUTION TO CLIMATE CHANGE:

There are a number of things you can do to directly reduce your carbon footprint, at home, at work, and when traveling.

- Replace inefficient incandescent light bulbs with efficient CFLs or LEDs.
- Turn off the lights when you leave a room.
- Install solar panels on your home.
- Use public transportation.
- Carpool.
- Keep your tires properly inflated and get better gas mileage. Your car will save gas and emit less carbon.
- Walk or ride a bike when possible.
- Lower your heater thermostat by two degrees in winter and increase it by two degrees in the summer.
- Purchase energy-efficient appliances and electronics.
- Hang your clothes on a line instead of using a dryer.
- Lower the temperature on your water heater.
- Contact your utility company and find out about renewable energy options.
- Turn off and unplug electronics you're not using. This includes turning off your computer or cell phone at night.
- Take the stairs instead of the elevator to save energy (and get exercise!).
- Reduce your meat consumption to curb carbon emissions from the livestock industry.
- Teleconference instead of traveling. If you fly five times per year or more, those trips are likely to account for 75% of your personal carbon footprint.
- Consume less plastic products (made from fossil fuels) to reduce your carbon footprint and waste.

REDUCE YOUR WATER CONSUMPTION:

- Turn off the tap when you brush your teeth: which can save several liters of water each time.
- Take a shorter shower and save between 6 and 45 liters per minute.
- Turn off the faucet while you are soaping up in the shower.
- Use a water saving shower head. It will not affect the perceived flow of water and you will save quite a bit on your water bill.
- Run your washing machine and dishwasher only with a full load of clothes or dishes.
- Fix any dripping tap and have your faucets and toilets checked at least once a year.
- Install a rainwater catcher to your drainpipe and use the rain to water your plants, clean your car and wash your windows. Specialty rainwater catchers can be found online and can collect around 5,000 liters a year. Check local laws related to collecting rainwater and make sure to comply.
- Water your garden with a watering can instead of the hose. Mulching your plants (with bark chippings, heavy compost or straw) and watering in the early morning and late afternoon will reduce evaporation and also save water.
- Use drought-resistant plants in dry areas.

DO NOT CONSUME WILDLIFE PRODUCTS, ESPECIALLY THOSE THAT ARE ILLEGAL:

- Many products made of wild animals or plants are sold legally around the world. You might want to think carefully before buying such products. Is there an strong personal reason to buy animal parts? Can you buy something instead that does not contain wildlife parts and still fulfills your need?
- There is also a huge demand worldwide for illegal products made from wild animals and plants, many of them endangered. This demand finances a very large illegal and ruthless industry, which devastates species populations around the world. The illegal traffic of plants and animals does not focus only on iconic species such as elephants, rhinos, or tigers. It includes thousands of species small and large. Many are killed and butchered on site. Other animals are sometimeskilled in the process of capturing one or more live specimens. Please think twice before buying a wild animal as a pet.
- Always ask questions before making a purchase of a product that could have been made from wildlife. Ask: what is this product made of? Where did it come from? Is it legal to sell this product here? Does this country permit the sale and export of this product? Do I need a permit to transport this product?
- Many countries are signatories of an international agreement called CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora). This treaty, signed by 183 parties, was created to protect endangered species and fight against their illegal trafficking. Likewise, many countries have passed legislation that limits the trade of wildlife and products made from their parts. Please support campaigns to have your country join CITES (if it has not yet) and also legislation to protect wildlife in your country and abroad.

REDUCE POLLUTION:

- Use environmentally-friendly, non-toxic cleaning products. Many can be made at home. For example white vinegar mixed with water makes for a great all-purpose cleaning product for non wood surfaces.
- Reduce or eliminate the use of all pesticides.
- Do not use chemical fertilizers.
- Properly dispose of all chemical products, such paints, solvants, etc.
- Do not flush your medicines down the toilet. Chemicals in medicines have been found in many waterways and can affect wildlife. Find out if there are dop-off locations for unused medicine in your area.
- Do not use sunscreen lotions that contains oxybenzone and octinoxate, chemicals believed to cause harm to marine life and coral reefs.

PREVENT PLASTIC POLLUTION:

- Reduce your consumption if single-use plastics, or eliminate them entirely.
- Recycle everything you can.
- Participate in clean-ups.
- Pick-up plastic debris when you see it, especially in natural spaces.
- Join campaigns to convince businesses, large events, schools, and universities to choose reusable or non-plastic utensils, trays, and dishes for their events.
- Support campaigns to pass local or national legislation to control or ban the use of single-use plastic.
- Check out our Plastic Pollution Primer and Action Toolkit.

PROTECT HABITAT:

- Join campaigns to have the local or national government protect undeveloped areas, especially if they contain rich biodiversity.
- Support or volunteer with organizations that execute conservation projects on the ground.
- Support a Conservation Land Trust organization in your area. Land trusts can be national organizations or local grassroots groups. Click here to find a land trust near you.
- Sign conservation easements for your property if this option is available in your country. Conservation easements give owners the assurance that their property will have to meet certain environmental qualifications, even if passed to a future owner. It is a legacy for future generations.

ADDITIONAL RESOURCES

ARTICLES/BLOGS/READINGS

Overwhelmed by Climate Change? Here's What You Can Do – *The Guardian*

https://www.theguardian.com/environment/2018/oct/08/climate-change-what-you-can-do-campaigning-installing-insulation-solar-panels

This article gives several examples of what individuals can do to combat climate change.

20,000 Species are Near Extinction: Is it Time to Rethink How We Decide Which to Save? – *National Geographic*

https://news.nationalgeographic.com/news/2013/12/131216-conservation-environment-animals-science-endangered-species/

This article looks at the moral responsibility that humans have to save species facing extinction. With more and more species going extinct every day, how do we decide which species deserved to be saved?

VIDEOS

Act Now to Save wWildlife: 5 Actions That Aake a Difference – *World Bank*

http://www.worldbank.org/en/news/feature/2017/11/28/act-now-to-save-wildlife-5-actions-that-make-a-difference

"Most people are shocked when they learn iconic species such as rhinos, tigers, and elephants could face extinction in our lifetime, yet they feel helpless to act. Each individual action has a ripple effect and every person can make a difference—through a critical mass we can turn the tide."

STORYTELLING

Scientists Call for a Paris-Style Agreement to Save Life on Earth – *The Guardian*

https://www.theguardian.com/environment/radical-conservation/2018/jun/28/scientists-call-for-a-paris-style-agreement-to-save-life-on-earth

This article talks about how scientists believe that a much more ambitious climate agreement must be crafted in order to combat climate change.

The Challenge of Protecting our Species

WHAT DOES IT MEAN FOR US? A MOMENT OF INTERNAL REFLECTION

What does it look like for someone to live a life with the understanding that all species have intrinsic value? What decisions will we have to make on a day-to-day basis if we are extending to all other species the same rights and values we give to other humans? When we analyze what this new paradigm would look like, it takes the form of a number of tradeoffs. These can be visualized through the following six questions:

First, should we assign value to other species based only on their direct benefit to us, or is their value inherent simply because they exist?

Second, as the only species with the capability to consciously influence the lives of every other species on earth, do we have a responsibility to protect them, even if it is difficult?

Third, do we have the right to completely wipe out another species if that species is causing harm to humans, or is it our responsibility to find alternative solutions?

Fourth, is it our responsibility to find a way to harvest plants and animals to meet our needs that is both humane and sustainable for the species in question?

Fifth, can we embark on new development without first evaluating and being fully aware of the impacts it will have on the survival of the species around us and being willing to make tradeoffs to ensure they are not harmed?

Sixth, can we have an open and honest conversation about the need to change cultural practices that might not be in line anymore with the objective of protecting all species from extinction?

Finally, can we pass policies on the local, national, and international levels that will codify species protection to prevent the further loss of species and their habitats?

As you read through these ideas, keep in mind this trade-off involves another living thing; one that simply wants to grow, reproduce, and create future generations. We are all living things trying to survive together on the one planet we have. It is up to us to find a way to coexist in harmony with all other species, regardless of what they are.

ADDITIONAL RESOURCES

ARTICLES/BLOGS/READINGS

'The Empathic Civilization': Rethinking Human Nature in the Biosphere Era – *Huffington Post*

https://www.huffingtonpost.com/jeremy-rifkin/the-empathic-civilization_b_416589.html

Jeremy Rifkin describes the place for humans in the newly emerging global ecosystem.

12 Things We Should All Do To Protect Endangered Species – *Huffington Post*

https://m.huffpost.com/us/entry/us_58bd9c87e4b0abcb02ce2067/amp

This is a guide containing twelve relatively easy things individuals can do in their day-to-day lives that will make life better for endangered species.

How to Pay for Saving Biodiversity – *Science Magazine*

http://science.sciencemag.org/content/360/6388/486

This article explores how private sector involvement in a global agreement could help conserve global biodiversity, and how to overcome the funding problems often seen in biodiversity protection.

REPORTS

Dignity In International Human Rights Law: Potential Applicability In Relation To International Recognition Of Animal Rights – *Michigan State*

https://digitalcommons.law.msu.edu/cgi/viewcontent.cgi?article=1231&context=ilr

An academic examination of whether international human rights laws can and should be transposed to an international legal recognition of animal rights.

Learn and Act to Protect Our Species

This is the final section of this toolkit, which features profiles of several different plants and animals. These profiles were chosen because each illustrates important threats placed on plant and animal wildlife by human activity. Each profile includes noteworthy facts about the selected plant or animal, their role in the ecosystem, why you should care about their protection, the threats they face, and a list of suggestions about things you can do to help protect these species.

Clicking on each of the following profiles will take you to a dedicated document containing the information outlined above. You can download or print each document.

- Giraffes
- Bees
- Whales
- Elephants
- Coral Reefs
- Insects
- Great Apes
- Birds
- Plants
- Trees
- Fish
- Crustaceans
- Sharks
- Sea Turtles

Endnotes

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