

INTRODUCTION: VANISHING

The last mass extinction, leading to the destruction of the dinosaurs, was caused by an asteroid colliding with earth around 66 million years ago. The blame for the next one lies much closer to home - with us. Soon, all that might be left of some of the planet's 1 million species at risk of going extinct in the next century are specimens, photographs, and memories contained within archives and museum collections. As human actions lead to the extirpation of an increasing number of the world's plants and animals, the burning question remains: what do we really lose when a species disappears, and is there anything we can do to slow or halt extinction in the age of the Anthropocene? In this exhibit we'll seek to answer some of these complex questions, including how we arrived at where we are today using historical examples. Hopefully, by learning from the past we can change our direction in the future.

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CASE 1: Understanding Extinction: Species & Human Impacts

Long before the publication of Darwin's now-famous treatise on evolution by natural selection, *On the Origin of Species* (1859), people sought to understand and classify the natural world and humanity's place within it using religious worldviews and various human-centric classification schemes. Through the mid-1800s, as explorers, collectors, and natural historians encountered an increasingly large number of different plants, animals, and fossils, they attempted to categorize these organisms according to rigid classification schemes. Instead of understanding species diversity according to genetic or functional data as is commonly practiced today, “experts” compartmentalized the world around them according to an organism's physical characteristics, its “usefulness” to humans, or its perceived level of “complexity”. By doing so, theologians and natural historians fitted organisms into hierarchies which they believed to be part of a Divine plan as outlined in traditional Judeo-Christian thought. Well into the beginning of the 20th-century, the notion that “primitive” mycorrhizal fungi living beneath a single acre of forest could not only be more diverse than all of the human species, but also more important for our survival than any of our cherished livestock, would not have proven palatable to most, even if scientists had the theoretical framework or scientific instruments to measure and understand species diversity.

Throughout the 19th century, the question of whether whole “species” - or *kinds* - of plants and animals could die out, or go extinct, was also a topic of much speculation and fierce debate. Early proponents of extinction were openly mocked or purposefully silenced because extinction was seen as contradictory to worldviews of a Divine and permanent order set in place by an all-knowing God. For instance, many natural historians used fossilized shells of extinct organisms, lifted to high elevations by plate tectonics over millions of years, as evidence of past cataclysmic events, but refused to acknowledge that these “relics” were evidence of species that had since gone extinct. As Europeans explored further beyond their borders and encountered countless unfamiliar plants

and animals, the possibility that fossilized animals could still be alive in some remote, yet-to-be-explored regions of the world kept this view alive, if only on life support. Over time, however, scientists such as Carl Linnaeus, Charles Darwin, and Ernst Mayr helped elucidate both how species emerge (i.e. natural selection and adaptation to different environments) and die out throughout geological time (i.e. abrupt changes in environmental conditions, competition between different species, etc.).

Just as it took considerable effort, evidence, and ideological shifts to understand what constitutes ‘diversity’ in the natural world and to recognize extinction as a natural process, Western cultures were also slow to recognize, or at least openly acknowledge, the ability of humans to extirpate entire species and harm the environment in the process. Similar to how proponents of evolution had to defend their ideas against traditional religious doctrine, early environmentalists such as George Perkins Marsh and John Muir dared to contradict the dominant narrative of human progress through expansion and extraction espoused by colonialists and industrial optimists. By challenging dominant narratives of colonialism and the Industrial Revolution- that increased production and consumption, as well as subjugation of the natural world would ultimately better humanity – these authors and early activists enabled societies to begin recognizing their wrongs and to critically evaluate their impacts upon the planet.

Following the era of Marsh and Muir, the important role plants and animals play in properly-functioning ecosystems, in addition to the relationship between human impacts and extinction across the globe became increasingly clear. From commercial sales of beaver pelts in Paris leading to population declines across Canada and the U.S., to the liberal spraying of harmful pesticides (i.e. DDT) across North America backyards causing the near extermination of America’s eagles and falcons, cries for conservation escalated from a moral plea to an urgent imperative. This shift is perhaps best exemplified by the birth and subsequent explosion of the term “biodiversity”, coined in 1988 to guide conversations surrounding species conservation. Biodiversity - defined as the variety of life, or number of species or varieties in the world or a particular ecosystem at a given time - quickly became a rallying cry during conversations about rapid species loss in an age of globalization and rapid climate change.

Overall, in the course of little-over a century, a mere blip in the expanse of human existence, our view of the natural world has evolved from a poorly-understood assemblage of plants and animals, provisioned by a higher power to be exploited and subjugated for the benefit of humanity, to a complex interconnected network of species whose survival is both affected by and critical to our own. As biologist, environmentalist, author, and early crusader for biodiversity E. O. Wilson voiced the new wave of environmental consciousness in 1988: “*diversity is being irreversibly lost through extinction caused by humans...we are locked in a race. We must hurry to acquire the knowledge on which a wise policy of conservation and development can be based for centuries to come.*”

CASE 1 - ITEMS

- 1. Ole Worm, Villum Worm, Carel van Mander, G. Wingendorp, and Jean Elzevir.**
Museum Wormianum, seu, Historia rerum rariorum: tam naturalium, quam artificialium, tam domesticarum, quam exoticarum, quae Hafniae Danorum in aedibus

authoris servantur. Lugduni Batavorum Leiden: Apud Iohannem Elsevirium, 1655.
[Rauner Rare Book QH41 .W6 1655](#)

Natural historians like Ole Worm (1588 – 1654) sought to classify and understand the diversity of living organisms according to differences in their appearance in order to better understand God’s design in nature. This frontispiece depicts Worm's famous cabinet of curiosities, a massive collection of artifacts from across the globe, which included taxidermized animals, fossils, and weapons and tools owned by indigenous peoples. Look closely and you’ll notice several species now extinct, including the Great Auk, a seabird that Worm also owned as a pet.

- 2. Carl von Linné. *Systema naturæ; sistens regna tria naturæ, in classes et ordines, genera et species redacta tabulisque æneis illustrata. Ed. 6., emendata et aucta.* Stockholmia: Impensis G. Kiesewetteri, 1748. [Rauner Rare Book QH43.S21](#)**

Swedish naturalist and explorer Carl Linnaeus (1707-1778) revolutionized scientific understanding of the diversity of the natural world with the publication of *Systema naturæ* in 1735. Linnaeus established binomial nomenclature, the system of formally classifying and naming organisms according to their genus and species. In contrast to earlier naming conventions that used long descriptive phrases, binomial names do not judge different species on their perceived quality or desirability. Serving as a means by which species could be universally addressed, this new hierarchical system allowed scientists to better conceptualize relationships between organisms.

- 3. Charles Darwin. *Journal of Researches into the Natural History and Geology of the Countries Visited During the Voyage of H.M.S. Beagle Round the World: Under the Command of Capt. Fitz Roy 2nd ed., corr. with additions.* London: J. Murray, 1845. [Rauner Rare Book QH11 .D2 1845](#)**

Charles Darwin’s (1809-1882) narrative of his voyage around the globe features the famous Galapagos finches whose beaks helped him develop his theory of evolution by natural selection. By observing the incredible variety of beak shapes among finch species, he postulated that the beak of an ancestral finch who had arrived at the remote island chain had adapted over time to equip the finches to acquire different food sources. Drawing on the diversity of Galapagos finches and other animals he encountered as examples of evolution by natural selection, Darwin’s theory fundamentally changed human understanding of species and how ecosystems change over time. Darwin posited that many species have died out as a result of competition between animals, and that this process had occurred gradually and continuously throughout the history of life. However, he neglected to clarify the role humans can play in driving species extinction, and believed that sudden disappearances of many species, or mass extinctions, did not actually occur.

- 4. Edward O. Wilson and Frances M. Peter. “Biodiversity.” Washington, D.C: National Academy Press, 1988. [Depository QH75.A1 N32 1986](#)**

The 1980s witnessed a rise in concerns related to species conservation, due to growing awareness of the close link between economic development, deforestation, and extinction. This shift is evidenced by this publication by famed biologist, naturalist, and writer Edward O. Wilson which features the first appearance of the word “biodiversity” (defined as the variety of life in the world). Wilson writes, “The diversity of life forms, so numerous that we have yet to identify most of them, is the greatest wonder of this planet... The book before you offers an overall view of this biological diversity and carries the urgent warning that we are rapidly altering and destroying the environments that have fostered the diversity of life forms for more than a billion years.”

5. **John Ray. *Three Physico-Theological Discourses, Concerning I. The Primitive Chaos, and Creation of the World. II. The General Deluge, Its Causes and Effects. III. The Dissolution of the World and Future Conflagration. : Wherein Are Largely Discussed, the Production and Use of Mountains, the Original of Fountains, of Formed Stones, and Sea Fishes Bones and Shells Found in the Earth; the Effects of Particular Floods, and Inundations of the Sea; the Eruptions of Vulcano's; the Nature and Causes of Earthquakes. Also, an Historical Account of These Two Remarkable Ones in Jamaica and England. With Practical Inferences. The 4th ed. corr.* London: Printed for W. Innys, 1732. [Rauner Woodward Room 314](#)**

In this book, English naturalist John Ray elaborates on beliefs about the Great Flood from the Bible's Book of Genesis, during which God decides to reverse and redo creation by returning Earth to a state of watery chaos. While many 18th century natural historians and theologians used discovery of fossils (such as seashells in the Alps) as evidence of a global-scale flood, they did not see them as evidence of extinction. For many people during this time period, the idea of extinction was religiously troubling; it would suggest some flaw with God's divine plan at the beginning of the world. Additionally, belief that all life on Earth forms a Great Chain of Being—from ocean slime to angels—would make extinctions problematic breaks in its links.

6. **George P. Marsh. *Man and Nature or, Physical Geography as Modified by Human Action.* New York: Scribner, 1864. [Rauner Alumni M352ma](#)**

George P. Marsh (1801-1882), Dartmouth Class of 1820, is considered America's first environmentalist and among the first American natural historians to comment on species extinction. *Man and Nature* raised concerns about the destructive global impacts of human activities on the environment, including plants and animals. For instance, Marsh describes how European demand for beaver fur nearly doomed the industrious mammal to extinction in the Americas: “Parisian fashion has unconsciously exercised an influence which may sensibly affect the physical geography of a distant continent.” *Man and Nature* was received favorably and helped sparked the Arbor Day movement, the establishment of forest reserves and the national forest service.

7. **Thomas Malthus. *An Essay on the Principle of Population: as It Affects the Future Improvement of Society.* London: J. Johnson, 1798. [Rauner Val 312 M299e 1798](#)**

Our first edition of this famous work by Thomas Malthus (1766-1834) was published anonymously so as to avoid backlash. Malthus' book contrasted with the optimistic views of Enlightenment thinkers such as Jean Jacques Rousseau by warning of future difficulties that would arise as human population growth outpaced food production. This essay sparked discussions about the environmental impacts of exponential human population growth, along with highlighting problems like poverty and famine.

8. **Samuel G. Goodrich. *Enterprise, Industry and Art of Man: as Displayed in Fishing, Hunting, Commerce, Navigation, Mining, Agriculture and Manufacturers*. Boston: G.C. Rand, 1853. [Rauner 1926 Coll G6433](#)**

Written as an ode to the power of global trade, *Enterprise, Industry and Art of Man* is representative of the sense of awe Europeans felt about their ability to “tame” wilderness and harness it to better society during the Industrial Revolution. In the volume's preface, Goodrich marvels at the origins of the material comforts in his personal study, including a piano whose materials hailed from forests of Brazil, Maine, and elephants in Africa. Meditations on his Argand lamp are of particular interest for “its oil [that] once dwelt in the head of a whale seventy feet in length, and which sloughed the Pacific for half a century.” As this quote (and illustration above suggest), the efficiency and global reach of extractive enterprises such as whaling were examples of progress and sources of pride in the minds of Western cultures.

CASE 2: Causes & Consequences of Species Extinction

Despite the fact that humans have accelerated the rate of extinction for hundreds of years, the idea that species loss constitutes an environmental crisis has only recently gained widespread attention. For example, although at least 571 species of plants have gone extinct in the wild since 1750 (according to global surveys recently published in *Nature Ecology & Evolution*), scientists have only begun concerted efforts to save these possibly invaluable species in the last half-century. Today, discussions surrounding extinction focus on the physical impacts of 7 billion people's large footprint upon the planet - from deforestation in the Amazon Rainforest due to the need for more agricultural lands, to severe bushfires in Australia aggravated by copious combustion of fossil fuels. However, the historical roots of our current problems developed long ago and, although understanding them could help us address our current crisis, they've received comparably little press coverage. In this part of the exhibit, we use historical examples of how deliberate overexploitation, a focus on high-productivity, and a strong desire to “tame” wilderness, steeped in ideological notions of colonialism, led to local extinction or the near destruction of many species - from the plains bison to the Bald Eagle. Long before the Earth felt the strain of ~ 7.5 billion humans, our impact on the world's oceans, grasslands, and forests was disproportionately large compared to our population size due to these common sociocultural norms. Today, I hope these books provide windows into the prevailing norms of the past, demonstrating how our beliefs can guide our actions - for good or for bad - and hence how large of an impact we have on the environment.

Aside from showcasing the root causes of species extinction, these historical examples offer valuable lessons of what is at stake when a species is lost. Many of us agree that nature has an intrinsic value in and of itself or is valuable to protect because destruction of life is morally wrong. However, there exist many other tangible examples of values that are lost when a species goes extinct. For example, the disappearance of species previously used to satisfy some human requirement, want, or need (e.g., whales being hunted for their oil, which was used to light lamps and stoves), has led to a considerable loss of *use value*. The loss of species that have high *use value* forces us to find alternative, and likely costlier, means of satisfying human needs and wants (e.g., extraction of fossil fuels like petroleum and natural gas or to run lamps, stoves and engines). Likewise, the historical extirpation of whales and other animals imbued with spiritual significance and/or used to support customs, beliefs, and especially indigenous ways of living and transmission of cultural knowledge - such as plains bison or walrus - has also led to a significant loss in *cultural value*. The loss of *culturally valuable* species makes it challenging for communities to maintain their traditions, sovereignty, sustainable practices and sense of community. Losing *culturally valuable* species also frequently exacerbates the large negative impacts still felt by indigenous communities from the legacy of colonialism; since many rely upon diverse and native plant and animal species to nourish healthy diets and communal relations, and even Native languages. As Inuit activist and scholar Sheila-Watt Cloutier remarks:

"Nowhere else in the world does ice and snow, and the animals that rely upon it, represent transportation, mobility, and life for peoples. Ice and snow are our highways that bring us to the supermarket, which is the environment and links us to each other (and other communities). Several communities already as we speak are so damaged by global warming and climate change, and with it the loss of traditional foods, that relocation at the cost of millions of dollars is now the only option."

In the lived experiences of Cloutier and many other indigenous and rural community members around the world, species loss exacerbated by globalization and global warming is one of the ugly faces of modern colonialism.

Furthermore, given how interconnected species are within their respective ecosystems, the loss of any given species can also have an unexpected domino effect upon other linked species, leading to a loss of *environmental value*. For example, the loss of the famous passenger pigeon from America's forests has now been linked to increased numbers of rodents and hence Lyme-disease-carrying ticks, which in turn negatively impact human health on the scale of billions of dollars each year. By extirpating an insatiable seed-gobbling bird that once numbered in the billions, we effectively lost the environmental value these birds provided in suppressing rodent populations and, in turn, Lyme disease. With a reduction in *environmental value*, other organisms who depend on proper functioning of the ecosystem (which includes humans) may suffer.

Similarly, whenever an animal or plant goes extinct, the loss of genetic diversity reduces the options available to future generations when we face problems such as disease or drought. Stated alternatively, reducing genetic diversity diminishes *bequest value*, or, the value a current generation places on ensuring the availability of biodiversity and ecosystem functioning to future generations. For example, as we lose varieties or species of plants that possess medicinal properties or are more resistant to certain diseases, future generations will have less options in combating

pathogens threatening ourselves or our food supply. Examples of lost *bequest value* abound in our historical records, including here in the Northeastern United States where the number of apple varieties has been reduced by over 75%, from an estimated 17,000 in the mid-1800s to 4,000 today. The culprit? A growing and unquenchable desire for larger, cheaper, more uniform apples has led farmers to abandon heirloom varieties in favor of a smaller number of apple types suitable for industrial production.

Overall, the loss of any given species - even unsightly insects or snakes - brings with it the loss of multiple values that directly or indirectly affect our ability, or the ability of other organisms, to persist and live comfortably on planet earth. The most troubling aspect of current trends in extinction is that species are disappearing so rapidly that scientists don't have time to fully understand what might be at stake until it's too late. Like the disappearance of passenger pigeons from America's skylines, it sometimes takes nearly a hundred years for the negative effects to be felt and quantified, and sometimes the ramifications are not what might be expected.

CASE 2 – ITEMS

1. **Inupiaq polar bear ivory carvings, circa 1960s. Frances Ross papers. [MSS-254, Box 12, Folder 4.](#)**

These walrus ivory carvings owned by Alex Magtoya were produced by native Inupiat people of the Arctic Ocean and Bering Sea regions. Indigenous communities of the Arctic have hunted walrus (among other sea mammals including seals and whales) as sources of food for hundreds of years, utilizing their skins, bones, and tusks for clothing, tools, and crafts. Walrus populations plummeted around the Arctic by the early 20th-century following the arrival of Europeans, only to rebound when limits were placed on commercial hunts. Today, walruses, polar bears, and many other Arctic animals face an even-deadlier threat - global climate change.

2. **Debra Magpie Earling and Peter Rutledge Koch. *The Lost Journals of Sacajewea*. Berkeley: Editions Koch, 2010. [Rauner Presses K769ealo](#)**

Debra Magpie Earling, a member of the Confederated Shalish and Kootenai Tribes of the Flathead Reservation, created this artist book during the bicentennial of the Lewis and Clark expedition to represent the hardships brought upon Native American cultures by colonialism. The cultural importance of the plain's bison and the effects of its near extermination from the American West is reflected in both Earling's poetry and the materials used to construct the book—it's printed on smoked buffalo rawhide cover paper with trade beads and rifle shell cartridges adorning the spine. Earling writes, "Only a few photographs document the extermination of the bison and the hunter's struggles against starvation. Instead, as if to marginalize the dying cultures, countless images survive that depict the arrival of the mining spectator, soldier, cowboy... all that followed to give us a thorough and close-up look at the noble savage-free territory of post-bison civilization."

3. **Photographs of plains bison in Wainwright Park, 1920. Vilhjalmur Stefansson Photographic Files, circa 1890-2002. [MSS-238, Box 4, folder 27](#)**

Herds of bison roamed what is now Banff National Park in Alberta, Canada for 10,000 years until nearly driven to extinction by human activity prior to the park's creation in 1885. These photographs depict herds of plains bison in Wainwright Buffalo Park, Canada, established in 1909 to regenerate dangerously low populations of bison (and to produce beef as the photo captions indicate). In December of 2019, Parks Canada announced the release of a small herd of plains bison in Banff, over 140 years after local populations were hunted to extinction.

4. Flit insecticide cartoons, 1929. Theodor S. Geisel collection. [MS-1100, Box 1, Folder 2](#)

Long before his success as Dr. Seuss, Theodore Geisel (Dartmouth Class of 1925), designed advertisements for Flit, Standard Oil Company's wildly popular spray-pump insecticide which later contained DDT. Over the course of 17 years, Geisel's humorous advertisements helped make Flit a household name throughout the 1930s and 1940s. At the time, liberal spraying of pesticides around people, animals, and crops was highly encouraged with little regard to potential environmental impacts.

5. Rachel L. Carson, Lois and Louis Darling. *Silent Spring*. Boston: Houghton Mifflin, 1962. [Depository SB959.C3](#)

After the publication of Rachel Carson's *Silent Spring* in 1962, the American public began to question their use of modern synthetic pesticides, such as dichloro-diphenyl-trichloroethane, or DDT. In the 30 years prior to being banned in 1972, a total of 1,350,000,000 pounds of DDT was sprayed across the United States. Carson reported that birds ingesting DDT tended to lay thin-shelled eggs that would break prematurely, resulting in population declines of more than 80 percent. Despite fierce opposition from chemical companies, *Silent Spring* ushered along numerous changes, including a reversal in United States pesticide policy, a nationwide ban on DDT in agriculture, and the eventual establishment of the Environmental Protection Agency by those inspired by the text. The book condoned short-sighted tampering with the environment that was pervasive during the Cold War, challenging farmers, companies, and the U.S. government to consider the long-term side effects of their actions. Without *Silent Spring*, the ban on DDT and ensuing protections, the bald eagle and dozens of other bird species would have likely disappeared from the continental U.S.

6. *An Act for the Further Encouragement of the Whale Fishery Carried on by His Majesty's British Subjects*. London: Printed by John Baskett, Printer to the King's Most Excellent Majesty, 1733. [Rare Book SH381.G74 1733](#)

In hopes of encouraging more whaling expeditions around Greenland, British Parliament and King George II passed this Act. It provides for tax breaks and reduced costs for sailing supplies "on the condition that their firm purpose, and determined resolution... is to use the utmost endeavors of themselves and their ship's company to take whales, or other creatures living in the sea... and to import whales fins, oil, and

blubber thereof into the Kingdom of Great Britain.” The Act was instituted out of fears that Great Britain was falling behind other European nations in its production of whale oil. In the race for economic dominance by imperialist powers such as Great Britain, such acts led to increased hunting pressure even as whale stocks began to decline.

7. Leander Owen, whaling logbook, September 15th, 1881. Leander Owen papers, 1856-1888. [MSS-247, Box 1, Folder 3](#)

Leander Owen (1833-1911) was a ship captain and whaling master who travelled extensively through the Arctic during the peak of the Atlantic whaling fishery. Owen’s personal journal documents the first whaling trip ever made into the Arctic by a steam-powered vessel. The journal recounts the astonishing speed and efficiency with which sailors were killing Bowhead and North Atlantic right whales—both species that are endangered in their native habitats today. Each drawing of a whale’s tail in Owen’s journal denotes one animal successfully killed and “cut” (stripped of its blubber) within a given day.

8. Robert Manning. *Book of Fruits, Being a Descriptive Catalogue of the Most Valuable Varieties of the Pear, Apple, Peach, Plum & Cherry, for New England Culture. 1st ser.* Salem: Ives & Jewett, 1838. [Rauner 1926 Coll M359bo](#)

Not just animals face extinction. Humans have driven an estimated 600 plant species to extinction since the 1750s, along with thousands of locally cultivated varieties of staple food crops, from potatoes to apples. Once-popular New England apple varieties like the Pickman Pippin (see above) have since disappeared as higher-yielding and aesthetically uniform apple varieties used in industrial agriculture have come into favor. Scientists now express concern about our reliance on an ever-smaller number of plant varieties cultivated for human consumption, as this leaves large portions of our food supply vulnerable to be wiped out by a singular disease or pest, like during the Irish Potato Famine in the 1840s.

9. *Photographs of American Elms at Dartmouth College, circa 1950. Iconography 1647-1883-0000063A; 51A; 85A;78A;76A, and 60A*

These photographs, captured between 1950-1960, depict the large stands of American Elm trees that once towered above Dartmouth’s campus as well as their removal as the trees began dying following the accidental introduction of Dutch Elm Disease (DED). Prior to the introduction of DED, American Elm trees were so plentiful around Hanover that Dartmouth was known as the “campus of a thousand elms.” Originally native to Asia, DED came to America in the 1920s when shipments of logs cut in the Netherlands brought with them fungus-carrying bark beetles. Since the arrival of these beetles, DED has devastated native elms without resistance to the disease. Of the estimated 77 million elm trees in North America in 1930, over 75% had been lost by 1989. While there may not be a thousand, Dartmouth’s campus is still home to a few surviving elm trees, thanks to the help of periodic anti-fungal treatments and their isolation from one another; they stand as solemn testaments to the forests of years past.

Today, the World Conservation Union estimates that globally, introduced invasive species like Dutch elm fungus may be as damaging to local ecosystems as habitat loss.

10. Bonaparte, Charles Lucian, and Alexander Wilson. *American Ornithology; or, The Natural History of Birds Inhabiting the United States. Vol III.* Philadelphia: Carey, Lea & Carey; 1808-1814. [Rauner Rare Book QL674 .W76](#)

Alexander Wilson writes fondly of the Carolina Parakeet, America's only parrot species, but he also discusses how they were a considerable nuisance to farmers. Their appetites lent them to being "destroyed in great numbers, for whilst busily engaged in plucking off the fruits or tearing the grain from the stacks, the husbandman approaches them with perfect ease, and commits great slaughter among them." To make matters worse, the forests in which these birds lived were cleared in large swaths and their colorful feathers became popular decorations for women's hats. The last Carolina Parakeet died in captivity at the Cincinnati Zoo in 1918. Aside from their bygone charms, Carolina Parakeets were important seed dispersers, meaning their disappearance negatively affected various seed-bearing plants.

CASE 3: Extinction – What can we do about it?

Scientists contend that we're heading toward what would be the sixth mass extinction in the history of life on Earth. There's no doubt humanity has increased the rate of extinction by several orders of magnitude, but the extent to which ecosystems will be altered in the 21st century is still yet to be determined. Amid new challenges presented by global climate change and rapid globalization, the future is more uncertain than ever. One thing is clear though: collectively, we have a say in the matter - we can proceed with "business as usual", or we can reevaluate our perceptions of and relationship with the natural world in an effort to save more species from extirpation. The laws we enact, the value we place on plants and animals, the way we produce and consume food, the products we buy... all these actions collectively affect how many species will go extinct. Although a 2019 United Nations report presented grim findings that upwards of one million species "are now threatened with species extinction, many within decades", scientists contend that many organisms can still be saved, as long as we commit to changing.

Environmental success stories of the past - from changes in attitudes surrounding gray wolves to the passage of the Migratory Bird Act - serve as examples of what we can do to help. In each instance, humans exhibited a capability or a willingness to change behaviors and/or structures in order to protect and preserve a unique part of the natural world. If we continue to learn from past successes and take collective action to implement changes in the present, we can create what Wilson calls "a planet for *all* species."

CASE 3 – ITEMS

1. **Harry Whitney.** *Hunting with the Eskimos: the Unique Record of a Sportsman's Year Among the Northernmost Tribe: the Big Game Hunting, the Native Life, and the Battle for Existence through the Long Arctic Night.* New York: Century Co., 1910. [Rauner Stefansson SK265 .W6](#)

Harry Whitney (1873-1936; pictured above) was an American sportsman, adventurer, and author. He traveled to northern Greenland in 1908, staying the winter with the indigenous Inughuit to hunt polar bears, arctic hare, walrus, whales, and the prized muskox. A year after his second hunting trip to Greenland, he published this book about his experiences. Big-game hunting—the hunting of large animals for trophy, sport, or raw materials (such as meat, horn, bone, or oil)—became tremendously popular in the late 19th and early 20th centuries as wealthy, urban elites grew accustomed to increased amounts of free-time and disposable income. Unfortunately, unsustainable big-game hunting practices eventually led to considerable reductions in wildlife populations from the Arctic to Africa.

2. **William Barr.** *Back from the Brink: the Road to Muskox Conservation in the Northwest Territories.* Calgary: Arctic Institute of North America of the University of Calgary, 1991. [Rauner Stefansson QL737.U53 B37 1991](#)

Muskoxen hides were primarily used for sleigh and carriage robes in Europe between 1860-1916, as substitutes for rapidly disappearing bison hides. According to Barr's research, the Hudson Bay Company traded 17,485 muskoxen hides during the trade peak in the 1860s-1890s. After the number of muskoxen in the Northwest Territories reached a critically low level around 1915, legislation was passed in 1917 banning commercial hide sales. Thanks to these legal protections and subsequent management by local Inupiaq communities, muskoxen numbers have risen dramatically. Today the animals have recolonized practically their entire historic range.

3. **John Muir.** *Our National Parks.* Boston: Houghton Mifflin, 1901. [Rauner Val G89 M896o](#)

John Muir, the “Father of the National Parks,” was an influential Scottish-American naturalist, author, environmental philosopher, and early advocate for the preservation of wilderness. His letters, essays, and books have been read by millions interested in his experiences in nature. Thanks to Muir's activism, Yosemite Valley, Sequoia National Park, and many other wilderness areas have been preserved. The Sierra Club, which he co-founded, remains a prominent American conservation organization. In *Our National Parks*, Muir extolled the beauty, grandeur, and importance of Yosemite, Sequoia, Yellowstone, and other National Parks to the American public and urged continued preservation of these natural areas as sanctuaries for both humans and wildlife.

4. **Hastings Andrew, Ally Abner, and Nicholas Gilman.** *New Hampshire Wolf Bounty Receipt, 12 December 1778.* Rauner MSS 778662

"March 13, 1779 - Receiv'd of Nicholas Gilman Ten pounds, being the Sum allowed by an act of the General Court for killing a grown wolfe £10.00 and for Abner Ally... This may certify that on the 12 day of December 1778, Abner Ally of Chesterfield killed + brought in to me one grown Woolf which I have taken there + disfiggered it for me"

Wolf bounties paid to Gilman and Ally were worth a considerable sum; £10 in 1800 had the purchasing power of £816.00 in 2018. The hole punched in this document indicates the bounty was paid and cancelled to assure it was not cashed twice. Colonial and federal governments encouraged the extermination of wolves in the U.S. for over 300 years, as Europeans viewed them as bloodthirsty killers and threats to livestock.

5. Thomas McNamee. *The Return of the Wolf to Yellowstone 1st ed.* New York: Henry Holt, 1997. [Depository QL737.C22 M393 1997](#)

Wolf population recovery was made possible by the monumental declaration of protection for the gray wolf under the Endangered Species Act (ESA) in 1974. Reintroduction of wolves to Yellowstone National Park and Idaho in 1995 further enabled this recovery after years of political battles and grassroots efforts to win support from local ranchers. Since the wolf's return, scientists have documented a myriad of environmental benefits, including increases in beaver, brook trout, aspen, and willow tree populations. Elk and deer populations overgraze low-lying shrub habitats, altering river flows and habitats crucial to other animals if not checked by wolves. Gray wolves now inhabit 13 states, but their status as an endangered species remains in limbo at both the federal and state levels, threatening the potential progress enabled by their protection.

6. Thomas Parkin. *The Great Auk: Sales of Birds and Eggs by Public Auction in Great Britain, 1806-1910: With Historical Notes and five Plates.* London: British Ornithologists' Union, 1911. *Papers Relating to the Great Auk, 1895-1926.* [MS-660.](#)

The Great Auk was once a seabird native to the North Atlantic. Hunted since prehistoric times, its numbers dwindled rapidly as sailors learned to hunt the birds along the sea cliffs of Iceland and Nova Scotia. To make matters worse, the last colony of Auks was nearly destroyed by a volcanic eruption off of Iceland in 1830, after which only 60 birds remained. Museums and collectors began to worry that they might disappear and paid to have 48 of the surviving birds killed for specimens, ironically dooming the species to extinction. The last two Auks in the world were killed to add to a businessman's bird collection in 1844. The extinction of the Auk should be a sobering tale for us today. Will we wait until more species become specimens and collectables, or will we strive to protect species in their natural habitats before it's too late?

7. Susan Johanknecht and Katharine Meynell. *Volumes (of Vulnerability): Artist's Book Project: Curated by Susan Johanknecht and Katharine Meynell.* London: [Gefn Press], 1999. [Rauner Presses.J268vol](#)

Volumes (of Vulnerability) highlights the contemporary causes of what the authors call “a sixth mass extinction driven by human expansion,” such as consumerism and global climate change. In so doing, it challenges viewers to consider what each of us can do to combat these man-made threats to plants and animals. While Johanknecht and Meynell note that slowing species loss will prove difficult, they evoke biologist E. O. Wilson’s sentiment that “humanity is up for a challenge.”

8. **National Geographic. Washington, D.C: The National Geographical Society, October 2019, Vol. 236 (4). [Baker-Berry G1.N27](#)**

The October 2019 cover of *National Geographic* depicts Joseph Wachira, a keeper at the Ol Pejeta Conservancy in Kenya as he says goodbye to the last male northern white rhinoceros who died in 2018. This poignant image struck a chord with many readers, landing it a spot in the magazine’s “best photographs of the decade.” According to National Geographic photographer Joel Satore, photos like these are important to sensitizing viewers, “because extinction takes place so frequently now, it’s possible to become inured to it.” A recent UN report found that one million species “are now threatened with extinction, many within decades,” spurring National Geographic to dedicate their October edition to asking, “what do we lose when we lose a species?”

9. **Owen Richard. *Memoir on the Gorilla: (Troglodytes Gorilla, Savage)*. London: Taylor and Francis, 1865. [Rauner Rare Book QL737.P9 O8](#)**

English taxonomist and paleontologist Richard Owen (1804-1892) published *Memoir on the Gorilla* only nine years after Paul Belloni Du Chaillu became the first European to confirm the existence of gorillas in the wild during his expedition to Gabon in 1856. Owens – famous for having taught natural history to Queen Victoria’s children, his quarrels with famed naturalist Charles Darwin, and for naming a new taxon of large extinct reptiles – *Dinosauria* – in 1842 – wrote the first complete anatomical description of gorillas using several preserved specimens collected by Du Chaillu. Despite his anatomical accuracy, Owen’s anti-Darwinian views led him to erroneously state that gorillas lack certain parts of the brain that humans have, specifically a structure called the *hippocampus minor*, citing this as evidence that humans could not possibly be related to apes. Owens also erred in his account of the gorilla’s behaviors, reflecting the fear and misunderstanding of great apes that later led to their frequently being killed by thrill-seeking hunters and poachers in the late 19th and early 20th centuries. On page 35, Owens writes “Lacerations of the abdomen and laying bare of the intestines of a hunter are described as the effects of a blow of... the Gorilla... Mr. Du Chaillu also adduces the testimony of the natives, that, when stealing through the gloomy shades of the tropical forest, they become sometimes aware of the proximity of one of these frightfully formidable Apes by the sudden disappearance of one of their companions, who is hoisted up into the tree, uttering perhaps, a short choking cry. In a few minutes he falls to the ground a strangled corpse.” Even as primatologists later disproved these harmful perceptions of gorillas, gorilla numbers across Africa declined dramatically over the last century due to destruction of habitat from agricultural expansion and timber harvest, poaching, war and political unrest, and human disturbance. Today, all gorilla subspecies are classified as “Endangered” according to the International Union for

Conservation of Nature's (ICUN) criteria. However, dedicated conservation initiatives have ensured that gorilla numbers are now slowly increasing. Innovative new conservation ideas, including remotely monitoring gorilla movement and spreading awareness of the dangers of consuming bushmeat have shown some success in slowing gorilla population declines. In fact, the World Wildlife Fund recently announced that mountain gorilla numbers have increased to above 1,000 individuals for the first time in decades due to conservation efforts. Traditional protected areas are still one of the main conservation strategies to address threats such as hunting and habitat loss, however new tactics including working directly with logging companies and local communities to regulate the bush meat trade have also helped to reduce hunting pressure. If gorillas are to be conserved into the future, a combination of national parks, reducing human conflict, and working with local farmers and loggers will all be essential tools for maintaining viable populations.