# Wings and Well-being



Gonzales, A. (n.d.).

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## About the Author

Luce Burnford, the author of "Wings and Well-Being" is completing their senior year in high school in Maryland. Along with writing, they paint, birdwatch, ride horses, rock climb, and play guitar. Their love for nature- specifically birds, has had a continuous presence in their life. As Luce looks ahead to their journey abroad, where they plan to continue advocacy for the research and conservation efforts of birds, they are grateful for the opportunities OneNature has given them to make an impact.

## About OneNature

At OneNature, we believe that the well-being of all beings—humans, animals, and ecosystems—is deeply interconnected. Our work is rooted in the conviction that true conservation goes beyond protecting landscapes; it is about nurturing the relationships between people and the natural world. By integrating human well-being with conservation, we create lasting impacts that benefit both nature and communities.

# Introduction

From early caveman drawings to recent artistic expressions, birds have appeared in every age the world has seen. The evolution of these creatures has been traced back to the Jurassic period around 150 million years ago. Thanks to recent science, humans have discovered that many dinosaurs had feathers like today's birds. It is quite hard to imagine the little wrens of suburbs as dinosaurs of the past, but if you look at birds like the cassowary or secretary bird, the resemblance to what scientists have imagined dinosaurs to look like is clear. "In the few million years following the big extinction, birds went through an evolutionary explosion, adapting to new niches and diversifying into the many forms we know today" (Phillipsen, 2020). Since birds are continuously referred to as messengers and guides in many cultures, humans should acknowledge the positive influence of these creatures enduring positive influence.

Birds have been found to positively impact many factors of human life. For example, birdsong can be heard on nearly every continent. From seabirds to birds hiding among trees in forests, it would be strange to step outside and not hear a tweet, caw, or chirp. Bird feeders are quite common in many urban and suburban areas, adding a calming effect to those who witness birds flying in and out of their yards. Nowadays, the discussion of public attitudes towards birds is quite positive. As the Ecological Society of America's 2020 study discovered:

> Strongly held beliefs about positive or negative traits were also more consistent than ambivalent ones. The belief that birds were colorful and unique to the regional desert environment was particularly important in fortifying perceptions. People largely perceived hummingbird species and birds with distinctive traits positively. Similarly, urban-dwelling birds... were related to negative perceptions, probably due to human-wildlife conflict. (Andrade, 2022, p. 1)

Though birds provide substantially for humans and the world we share, not all birds are beloved by humans. Scientists from the second issue of The Condor write that "while birds were generally well-liked and annoyances were minor, several common and visible urban species, such as the House Sparrow (Passer domesticus), European Starling (Sturnus vulgaris), and Blue Jay (Cyanocitta cristata), may attract attention for their negative qualities, such as their sounds and effects on personal property" (Belaire et al., 2015, p. 192).

Research into bird behavior suggests that birds who create a strong impact by acting aggressively towards other birds or making unpleasant noises are misunderstood. Analysis of their behavior shows natural reasons for birds such as blue jays to act aggressively and

loud; they are protective of their young and spend a lot of time guarding their nests.

Understanding the true nature of birds like blue jays helps us appreciate the delicate balance between their behavior and the ecosystems they inhabit. This perspective aligns with our approach at OneNature, where we believe that the well-being of people and the natural world are deeply intertwined. Our work is rooted in understanding and fostering these connections, ensuring that communities and ecosystems thrive together. Birds, as both symbols and stewards of nature, play a pivotal role in this balance. This report highlights the diverse ways in which birds contribute to human well-being and the actions we can take to support these vital connections.

Birds have been a constant presence in human life throughout history, prompting important questions: Why are they so integral to our existence? What do they provide that is irreplaceable? Why should we strive to never take their presence for granted? And, perhaps most importantly, how do they contribute to our well-being?

## What is Well-being?

Well-being, which can be defined as “the combination of feeling good and functioning well” (Ruggeri et al., 2020), includes satisfaction with life, affect, psychological health, community, culture, education, environment, government, economy, time balance, and work, among other dimensions (Musikanski et al., 2021).

Well-being and wildlife are interconnected. This is demonstrated by numerous studies and personal experiences. Many people feel stressed, pent up, or restless during their lives if they do not experience the outdoors enough. People who engage in spending time outside find it easier to relax and think clearly. A study done for the Proceedings of the National Academy of Sciences states that “Green space can provide mental health benefits and possibly lower risk of psychiatric disorders. This nationwide study covering >900,000 people shows that children who grew up with the lowest levels of green space had up to 55% higher risk of developing a psychiatric disorder independent from effects of other known risk factors” (Engemann et al., 2019, p. 5188). Reports

of individuals engaging in birdwatching throughout the world have grown tremendously since the COVID-19 pandemic, as people sought an exciting, outdoor hobby.

Many ideas have been introduced to measure well-being on a world scale. Since 1937, Gross Domestic Product (GDP) has been used to determine a country's economic productivity. It was formed through the idea that an increased domestic product would increase the economy and therefore increase the success of said country. This measure overlooks social, mental, and environmental well-being. A more recent policy approach is called "Gross National Happiness." This idea - created by the government of Bhutan in the 1970s - is an alternative to gross national products:

> The concept of Gross National Happiness (GNH) has often been explained by its four pillars: good governance, sustainable socio-economic development, cultural preservation, and environmental conservation. Lately, the four pillars have been further classified into nine domains to create a widespread understanding of GNH and to reflect the holistic range of GNH values. The nine domains are: psychological well-being, health, education, time use, cultural diversity and resilience, good governance, community vitality, ecological diversity and resilience, and living standards ("Gross National," 2024).

This movement sparked many countries to diversify their systems of measuring well-being. Other systems like the Happy Planet Index, the Inclusive Wealth Index, and the Genuine Progress Indicator each incorporate various dimensions of well-being, from environmental sustainability to social equity. These frameworks offer more nuanced and inclusive approaches, challenging the reliance on economic metrics alone to define a nation's success.

# Domains of Well-being: Economic



Pathan, R. (2022, September 25)

Economic well-being has been defined by numerous indicators, including GDP per capita, employment rates, business trends, income distribution, and more. Manufacturing of products, industries of gas, lumber, and water maintenance are essential to maintain a positive economic well-being. Every process, function, and result has a cost in this domain, but how much do we take for granted? The ecosystem is a complex system of give-and-take between every biotic and abiotic factor. Ecosystem services are named as they are the services that the ecosystem naturally provides, which humans take advantage of. Four types of ecosystem services are as follows:

- Provisioning: Humans obtain physical products from the ecosystem, such as lumber, oil, water, etc.
- Regulating: Humans gain from the functions of parts of the ecosystems, such as pollination and the natural water cycle.
- Cultural: Humans gain cultural and spiritual enrichment from the ecosystem via its uses for recreation and aesthetics.
- Supporting: Humans are a part of the ecosystem and thus, like the ecosystem, rely on supporting services to function. Without these services, such as nutrient cycles and photosynthesis, the ecosystem would not function.

Regulating services in particular are discussed when considering the relationship between humans and the environment: “The attention given to RES (Regulating Environmental Services) is low due to its less tangible benefits and complexity to measure the benefits. Disregarding and lack of attention from policymakers and the scientific community may lead to unintended risks to human well-being and significant influences on the provision of other ES” (Mengist et. al., 2020, p. 1). Providing research and statistics to show how important these services are is fundamental to the education of our society and the protection of these services.

## The Economic Value of Birds

A paramount regulating ecosystem service is seed distribution. Researchers at the Cornell Lab of Ornithology review just how economically valuable seed dispersal is.

> In some tropical forests, birds disperse up to 92 percent of all tree and woody species, including 85 timber species, 182 genera of edible plants (including spices), 153 medicinal plants, 146 ornamental plants, and 84 genera with other economic or cultural uses….In Sweden's Stockholm National Urban Park, the human labor cost of replacing the seeding or planting of tree seeds by Eurasian Jays was estimated to be $2,450 to $11,250 per bird and $210,000 to $950,000 across the park. According to Diana Tomback, a professor of forest ecology at the University of Colorado at Denver, the estimated cost of replacing Clark's Nutcrackers' seed dispersal of whitebark pine is $1,980 to $2,405 per hectare and $11.4 to $13.9 billion across the range of whitebark pines in the U.S. (Şekercioğlu, 2017).

Not only are birds valued for their seed dispersal, but also for their pest control. Beginning in the late 19th century and ending in the 1930s, hundreds of studies explored the role of birds as biological control agents and pests in agriculture (Evenden, 1995). During this time, intense research was conducted to discover the value of birds. It was common for many to hunt birds for sport and many believed birds contributed to agriculture far more than was understood. When the research (which included the dissecting of contents of birds' stomachs) proved too laborious, the attention subsided. History indicates that as industrial agriculture rose, the value of biological pest control declined. A study on "economic ornithology demonstrated this trend. Over the period that synthetic organic pesticides rose to prominence, research on the beneficial effects of birds in agriculture dropped dramatically" (Evenden, 1995, p. 180).

Currently, the focus on economic ornithology, especially in agriculture, is on the rise. One example of avian pest control is in Dutch apple plantations, where "researchers found that birds' reduction of insect pest damage translated to a 66 percent increase in the yield of domestic apples. Similarly, researchers in Borneo estimated that bird pest control prevented 9 to 26 percent of the fruit loss in oil palm plantations. Matt Johnson and colleagues discovered that by reducing the damage caused by coffee berry borer beetles, birds in Jamaican coffee plantations increased coffee yield and farmers' income by $310 per hectare" (Şekercioğlu, 2017). The West Coast of the United States also has saved on pest control costs thanks to local owls. Mark Browning is a biologist and director of the Barn Owl/Rodent Project who, in 2011, "installed 25 nest boxes on a 100-acre vineyard in Lodi, California. After two years, 18 mating pairs of owls had moved in and removed over 25,000 rodents from the property at a fraction of the trapping and poisoning cost. Taking into account materials, labor, and upkeep, the cost per rodent removed by owls was $0.37, compared to $8.11 per rodent trapped. An annual application of strychnine

Cone, F. (2024, November 18).

poison, which costs $1,400 per year with unmeasurable success rates cost more in the long term than the initial $6,025 it took researchers to install nest boxes" (Robertson, 2017).

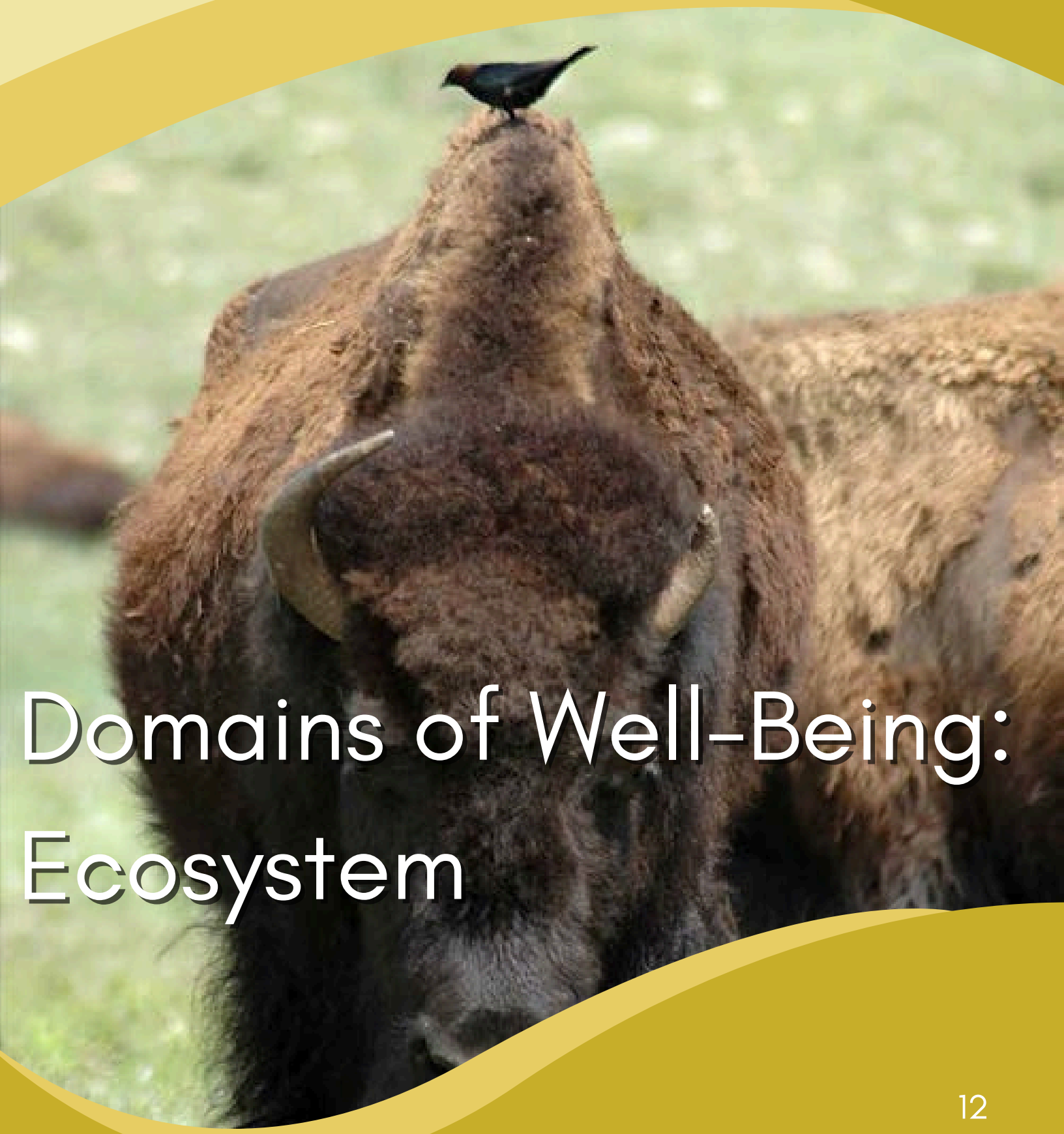
Farmers in Jamaica have also begun to realize the economic value of avian pest control. Hypothenemus hampei is a berry borer that originated in Africa but threatens coffee plantations worldwide. Research demonstrates an increase in the resistance to elevation that previously prevented H. hampei from damaging crops. H. hampei "has already benefited from the temperature rise in East Africa: increased damage to coffee crops and expansion in its distribution range have been reported" (Jaramillo et al., 2011, p. 1). The introduction of insectivorous birds on a Jamaican coffee farm resulted in a reduction in H. hampei. The researchers "estimated the economic value of the reduction of coffee berry borer by birds on the 18 ha farm to be US$310 ha-1 for the 2006 harvest season" (Johnson et al., 2010). The

use of birds as natural pest control prevents the use of chemicals in pesticides, creating a sustainable and economically efficient way to manage pests.

Since the COVID-19 pandemic, birdwatching as a recreational activity around the world has skyrocketed. As people were isolated, they turned their attention outside their windows to find a multitude of feathery entertainment in their yard. Vice President of Government Affairs at the Audubon Society writes, "In fact according to a new survey released today by the U.S. Fish and Wildlife Service, Birding in the United States: A Demographic and Economic Analysis, in 2022 nearly 96 million people also enjoy keeping tabs on our feathered friends" (Stadler, 2024). Nearly 40 percent of the United States population participates in this pastime, with one in three people statistically interested in it. With an increase in birdwatching participants, economic benefits also increase. Analysis of U.S. birdwatching finds that "in 2022, birders in the U.S. spent around $107 billion on birding-related trips and equipment, supporting local businesses and 1.4 million jobs in the process, according to the survey" (Stadler, 2024).

## Human Contributions

Because birding is so important to millions of people around the world, efforts are being made to protect these wonderful creatures at the heart of birdwatching. A fundamental change in the protection of the United States's species is discussed in the Audubon Society's discussion of the Urban Bird Treaty Act: "On the eve of World Migratory Bird Day, Representative Debbie Dingell (D-MI) introduced legislation that would support a program to conserve birds that live in and migrate through urban areas. The Urban Bird Treaty Act would authorize $1 million each year for a program that is currently being administered by the U.S. Fish and Wildlife Service" ("Proposed Legislation", 2024). "Our urban areas are critical nesting and migration areas for birds," said Felice Stadler, vice president of government affairs at the National Audubon Society. "We have lost 3 billion birds over the past 50 years due to habitat loss and other threats. Dedicated funding to conserve habitat in cities and towns and create bird-friendly communities is an essential part of reducing this decline and bending the bird curve. We know that when birds thrive, so do communities, including our urban communities" (Stadler, 2024). Efforts to protect birds go hand-in-hand with efforts to protect our environment. From uninhabited areas to cities, birds contribute to their environments.



# Domains of Well-Being: Ecosystem



Brigham, C. (n.d.).

The ecosystem we live in is vital to human survival on this planet. The air, water, and soil are all fundamental in everyday life; which is all supported by the biodiversity around us. The International Journal of Economics points out that "human livelihoods... are dependent on biodiversity as it provides ecological life support, functioning ecosystems that supply oxygen, clean air and water, pollination of plants, pest control, wastewater treatment, and many ecosystem services, therefore a loss of biodiversity and ecosystems and as it poses threat to the functioning of our planet, economy and human society (Elisha & Jebbin, 2020, p. 30). Every species of animal has an essential job in its environment. If any species were lost or inhibited from doing its job, the entire ecosystem would experience that loss in numerous ways.

ScienceAdviser's newsletter discusses the importance of seed dispersal. "Mutually beneficial interactions between plants and frugivorous birds have evolved for at least 80 million years. Now, more than 70% of flowering plants rely on birds to disperse their seeds, and about 56% of bird families consume fruits as part of their diet. Plants often have more than one seed disperser, and birds consume different types of fruits from different plant species, thus establishing a complex network of interactions" (Bello & Baretto, 2021).

## The Ecosystem Value of Birds

The network of interactions that fuels biodiversity thrived on the island of Guam for centuries until 1949, when a brown tree snake went ashore after a journey in a cargo ship. Guam was home to thousands of species of wildlife, including 25 resident bird species. 18 of these were native to Guam. Between 1976 and 1998, "22 species, including 17 of 18 native species, were severely affected by the snakes. Twelve species were likely extirpated as breeding residents on the main island, 8 others experienced declines of ⩾90% throughout the island or at least in the north, and 2 were kept at reduced population levels during all or much of the study" (Wiles et al., 2003, p. 1350). The brown tree snake has "eaten its way through 13 native bird species and two of the island's bats. With few native species left to eat, the snakes have moved on to eating rats and chickens" (Powell, 2009). Because these species had such an important niche that was now lost, the surrounding ecosystem has suffered. The effects of this loss are seen especially on "two species of bird-pollinated trees—one a mangrove that grows in tidal flats, the other a thorny tree of forests and woodlots—on

Guam and nearby snake-free Saipan. The two islands have similar growing seasons, plant species, and—until recently—bird populations. On Saipan, birds [had] made 95 percent of the visits to the two tree species (most commonly, Bridled and Golden white-eyes and the Micronesian Myzomela)" (Powell, 2009). Currently, these trees are visited by species of insects, beetles, rodents, spiders, but hardly any birds. These species are not capable of the level of pollination that birds provide and without such pollination, the trees are threatened. Research on the effects of these losses is discussed in the Cornell Lab of Ornithology's newsletter: "A survey of tree saplings and seedlings showed the price the tree species are paying for the lost pollinators. Mature trees—established before birds vanished—are equally common on the two islands' study plots, but Guam has fewer seedlings by a factor of about 50" (Powell, 2009). Without proper pollination and seed dispersal, many plants in Guam and its neighboring islands will need to be pollinated and replanted by hand to prevent becoming extinct there.

Mosteller, C. (2019, September 19).

Modern technology is becoming increasingly integrated into human life. Over the 20th century specifically, artificial fertilization of crops became popular. Before humans were able to infuse essential nutrients and minerals into the soil using machines and chemicals, how did they increase crop quality and yield? Just as they do for nearly every aspect of ecosystems, birds contribute to the soil too. Bird excrement carries nutrients that

are fundamental for our ecosystems. The poop of bats and seabirds (also known as guano) carries nitrogen, phosphorus, and many other nutrients for miles. Their impact greatly affects coastlines, where the highest numbers of seabirds can be found. Anthropology News finds that thousands of Dovekies migrate to Northern Greenland from the East Coast of the United States every year. These birds eat oceanic invertebrates and thrive in the freezing waters and cliffs along the northern Atlantic and parts of the Arctic Ocean. Dovekies bring nutrients from marine life and pass them onto the terrain of Greenland. Research demonstrates that "the influx of birds results in large quantities of marine nutrients in the form of guano, which enriches and fertilizes the soil and the generally sparse Arctic vegetation of lichen and grasses. In turn, this verdant florescence attracts terrestrial mammals such as muskox, hare, fox, caribou, and humans to the area" (Ebel, 2019). Dovekies alone can bring 3,500 tons of nitrogen to Greenland. In the 1860s, bird guano was such a valuable fertilizer that in the Chincha Islands War, Spain sought to control these islands due to their deposits of guano. Over time, guano lost its value as commercialized fertilizers popularized ("Guano War," n.d.).

Birds do not just benefit the environment through guano, but through what they eat. Birds are quite undervalued as nature's pest control. Barn swallows specifically work a tough job, swooping around to catch more than 60 insects an hour. Considering these birds move in flocks that can reach the hundreds and as they generally fly during daylight hours, these birds can eat thousands of bugs a day as a group. From mosquitos to grasshoppers and gnats, barn swallows take care of all of the pests that would otherwise join the family picnic.

Not only do birds provide numerous benefits for the ecosystems in the wilderness and in rural areas, but even in the great cities, birds lend a helping wing. In the skyscrapers of New York City resides the fastest bird in the world: peregrine falcons. These falcons can reach speeds of 200 miles per hour and leap on their prey from the sky. In uninhabited areas, falcons will nest in massive cliffs, thousands of feet above the rest of the world. The skyscrapers of New York City mimic these cliffs and provide the perfect grab-and-go meal along with it. The masses of pigeons and other animals such as rodents and ducks are perfect prey for these birds. As of today, nearly fifty breeding pairs have mated for life in the city, dining on the pigeons and other critters that inhabit the city. The only threats to peregrine falcons are unfortunately human-made. The pesticides that are used on rats are harmful to their predators. Another major threat to these majestic birds is glass. Collisions with windows have resulted in injuries and deaths of birds in cities and suburbs around the world, not just in New York. A step is currently being taken towards solving this problem: As of November 2020, all new buildings in New York City must meet bird-safe requirements to protect the local feathered friends. Bird-safe glass has patterns or marks that distort it- making it visible to birds while

allowing those inside to easily see out. This goes to show that birds contribute so much to our environment, so it is important to ask ourselves: What do we contribute to theirs?

## Human Contributions

Deforestation is a major threat to biodiversity everywhere. Wildlife can be devastated where deforestation occurs. South-East Asia experiences tremendous rates of forest loss, pushing species of plants and animals closer to extinction. Sundaland specifically faces forest loss as a result of increased demand in the palm oil industry. As a result of tens of millions of hectares lost to deforestation, thousands of species across the world have been moved to the International Union for Conservation of Nature's Red List, a system recording conservation statuses of endangered animals, fungi, and plants across the world. For example, the "Malay Crestless Fireback – a pheasant species that once occurred widely across Peninsular Malaysia and Sumatra – was reclassified from Vulnerable to Critically Endangered. Between 2001-2021, satellite data indicated that almost 70% of the forests on which it depends had been cleared" (Hughes, 2023).

Babu, N. (2024, February 6).

While the lush and diverse wilderness may seem distant to those living in more urban areas, humans and nature share the same need for clean air. Air pollution not only affects the air around us but also the quality of water and soil for food cultivation. The town of Harjavalta, Finland has supported itself through the smelting of metal since the 1930s. Birds made their journey to Harjavalta for breeding season, but in the 1970s, locals and scientists noticed that the pied flycatchers specifically were laying fewer eggs than in prior years, slowly dwindling the population every year. Researchers " traced the culprit back to the town's sole copper smelter: Sulfur oxide and heavy-metal particulates from the factory were wreaking havoc on the female flycatchers' metabolisms, causing them to produce thin-shelled eggs that wouldn't hatch. Around the same time, a different team of scientists discovered smelter workers had higher incidences of respiratory and stomach cancers" (Shivni, 2017). In this case, birds were able to show signs of air pollution negatively affecting living beings. This has caused more ornithologists to study how much air pollution affects birds around the world.

Many studies show that "long-term exposure to polycyclic aromatic hydrocarbons (PAHs), toxic chemicals commonly emitted by traffic, may cause reduced egg production and hatching, increased clutch or brood abandonment, and reduced growth in birds. A study in Spain found that blackbirds exposed to long-term air pollution were found to have significantly lower body weights" ("Birds Suffer," 2015). In 2016 alone, three million people were estimated to have died due to air pollution-related illnesses, as found by the World Health Organization. Because birds are exposed to more airborne particles and have higher rates of breathing due to their smaller sizes, studies are now finding the devastating results of air pollution on birds.

# Domains of Well-Being: Human Health



Ehlers, M. (2019, October 19).

Avian life around the world has proved to have an astounding effect on human physical and mental well-being. Humans can learn to understand the impact of birds through the idea of "One Health". This idea states that to be healthy as human beings, the world itself must be healthy. This means that the health of our Earth should be the top priority of all humans. Birds - as stewards of nature - contribute to the health of the Earth and should be viewed as our partners in protecting it.

## The Human-Health Value of Birds

Historically, birds have supported human health on numerous occasions. As the earth has progressed as an ecosystem, birds have shown their value in seed dispersal and pollination. This has resulted in the evolution and growth of hundreds of medicinal plants around the world. A study focuses on how birds transport seeds over long distances to increase biodiversity on islands. The Canary Archipelago, approximately 100 kilometers off of the west coast of Morocco is a stop for many birds on their migration journeys. "Up to 1.2% of birds that reached a small island of the Canary Archipelago (Alegranza) during their migration from Europe to Sub-Saharan Africa carried seeds in their guts" (Viana et al., 2016, p. 1). This study also provides research on the qualities that allow seeds to survive as they pass through birds' guts. "In Krakatau, for example, between 12 and 32% of the flowering plant species that colonized the island (as by 1994) after the volcanic eruption (in 1983) have seeds adapted to ingestion by or attachment to birds" (Whittaker & Jones, 1994, p. 245). Without the introduction of seeds via migratory birds, opportunities found within island biodiversity, from the exploration of islands' beauty to the discovery of plants' medicinal properties would be lost.

Not a day goes by where human life is not made better by avian life, whether humans realize it or not. In India, human health was greatly affected by the loss of an oft-disregarded bird. According to a BBC Study, immense loss struck the Indian vulture population due to a painkilling drug administered to cattle. This drug killed 91-98% of three species of vulture populations. It is estimated that "between 2000 and 2005, the loss of vultures caused around 100,000 additional human deaths annually, resulting in more than $69bn (£53bn) per year in mortality damages or the economic costs associated with premature deaths. These deaths were due to the spread of disease and bacteria that vultures would have otherwise removed from the environment" (Biswas, 2024). Additionally, the loss of vultures increased stray dog populations, increasing the rates of animals with rabies. Without a proper clean-up crew, bacteria and pathogens from carcasses spread into waterways

through the fecal matter of animals. Efforts are being made in India to help the vulture population bounce back. With the help of researchers, "India's remaining vulture populations are now concentrated around protected areas where their diet consists more of dead wildlife than potentially contaminated livestock, according to the State of Indian Birds report" (Biswas, 2024).

Mashurano, G. (2022, September 12).

Not only do birds mitigate some threats to human health, but they also assist in human sustenance. In produce farms, insects, rodents, and botanical diseases threaten the quality of the food and the health of those who ingest it. This has led to the investment of millions of dollars in developing pesticides that protect produce and do not harm those who ingest it. Numerous researchers question why so much time and money has been spent on these developments when natural pest control is much more cost- and time-efficient. From raptor boxes guarding orchards threatened by rodents to bluebird boxes posted among larvae-riddled vineyards, birds provide a healthy alternative to chemical pesticides. Not only has avian pest control dramatically reduced the negative effects of chemical pesticides but these forms are much more eco-friendly, promoting a natural solution to a major problem in the agricultural industry.

Birdwatching rates have risen significantly since COVID-19. This simple hobby has shown overwhelmingly positive impacts on human mental and physical health. Birdwatching often involves walking or hiking in nature. This can help improve cardiovascular health and physical strength. These activities also release endorphins, causing a

boost in mental health. Across Europe, increased biodiversity of birds is associated with increased life satisfaction (Methorst et al., 2021). At the neighborhood level in the UK, a higher abundance of birds present in the afternoon was associated with lower anxiety, stress, and depression (Cox et al., 2017). Furthermore, listening to birdsong was linked to perceptions of lower stress and attention recovery (Ratcliffe et al., 2013). Birdwatching, like forms of meditation and mindfulness, requires concentration and stillness, leading to the alleviation of stress and a state of tranquility. It is not only about what you can see, but what you can hear. Birdsong is a sound commonly associated with being in nature and produces a calming effect for many.

Birds and birdwatching is a widespread interest in many countries, with over one million members in the United Kingdom's Royal Society for the Protection of Birds, nearly 200,000 of these being youth members. Over seventy million people have shown interest in birdwatching in the United States. Birdwatching is an extremely popular activity in many parts of the world and is integrated into numerous cultures. Surveys around the world, particularly during the COVID-19 pandemic, demonstrate the calming, stress-relieving effects of listening to birdsong. These effects have only shown more promise for birdwatchers as more people embrace the calming effects of birdsong. More than one thousand volunteers from the United Kingdom, United States, China, and Australia were surveyed in a study that concluded that "everyday encounters with birdlife were associated with time-lasting improvements in mental well-being. These improvements were evident not only in healthy people but also in those with a diagnosis of depression, the most common mental illness across the world" (Hammoud et al., 2022, p. 1).

## Human Contributions

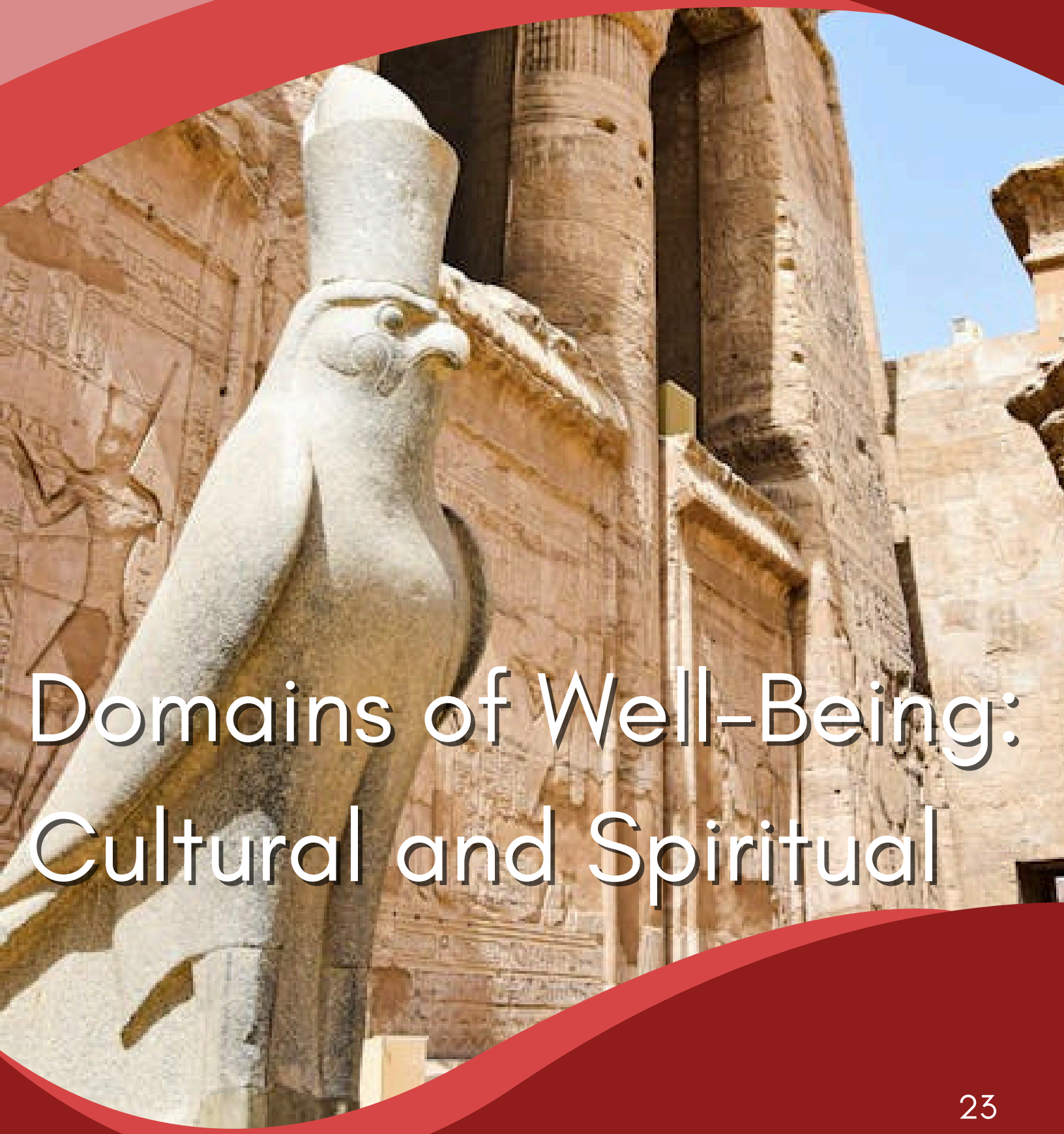
With millions of people exploring the world of birds via birdwatching, it is important to be mindful of not just what avian life means for humans, but how we contribute to avian life through birdwatching. Ethical birdwatching involves not only the enjoyment of nature but also the stewardship of it. Unethical birdwatching occurs when the space birds occupy is invaded, polluted, or disrupted in any way that causes harm to the environment or birds. These easily preventable occurrences cause further harm to bird populations as they are continually threatened by mass air pollution, waste, global warming, and deforestation. Several avian advocates are speaking out for ethical birdwatching. Prevention of littering, loud noises, and getting

too close all make a world of a difference for birds going about their natural lives. Using binoculars and setting up chairs from a distance provides birdwatchers with a clear and respectful view of bird habitats.

Sky, E. (2018, December 23).

Proactivity in conservation efforts also helps birds. Building nesting boxes and scattering seeds occasionally can provide a haven for birds, provided that the family cat stays indoors. Efforts to reduce carbon footprints can only have the large-scale effect it needs to have if individuals start contributing. Using bird-safe glass assures residents that birds will not crash into glass that is invisible to them. This can be done simply by hanging things on the glass so they can be easily noticed by birds. When enjoying birds and all they do for humans, it is important to be mindful of how we can continue to enjoy them far into the future.

Numerous groups have been organized to promote the impact birds have on human health. From the prevention of harmful chemicals in food via natural pest control and carrion regulation, birds provide invaluable services to human life.



# Domains of Well-Being: Cultural and Spiritual



AXP Photography. (n.d.).

For centuries, birds have been regarded as symbols of creation, peace, love, and so much more. Birds are one of the Earth's oldest creatures, with ancestors to modern birds having been around over 150 million years ago. These feathered dinosaurs still roam our earth today. Depictions of birds are being discovered on the walls of ancient caves throughout the world. Humans are only beginning to recognize the impact of birds on human culture and spirituality. From the doves of Christianity to the ravens found in Norse mythology, "They have been associated with a wide range of meanings and interpretations, reflecting their unique characteristics and behaviors" (Stevens, 2023).

## The Cultural and Spiritual Value of Birds

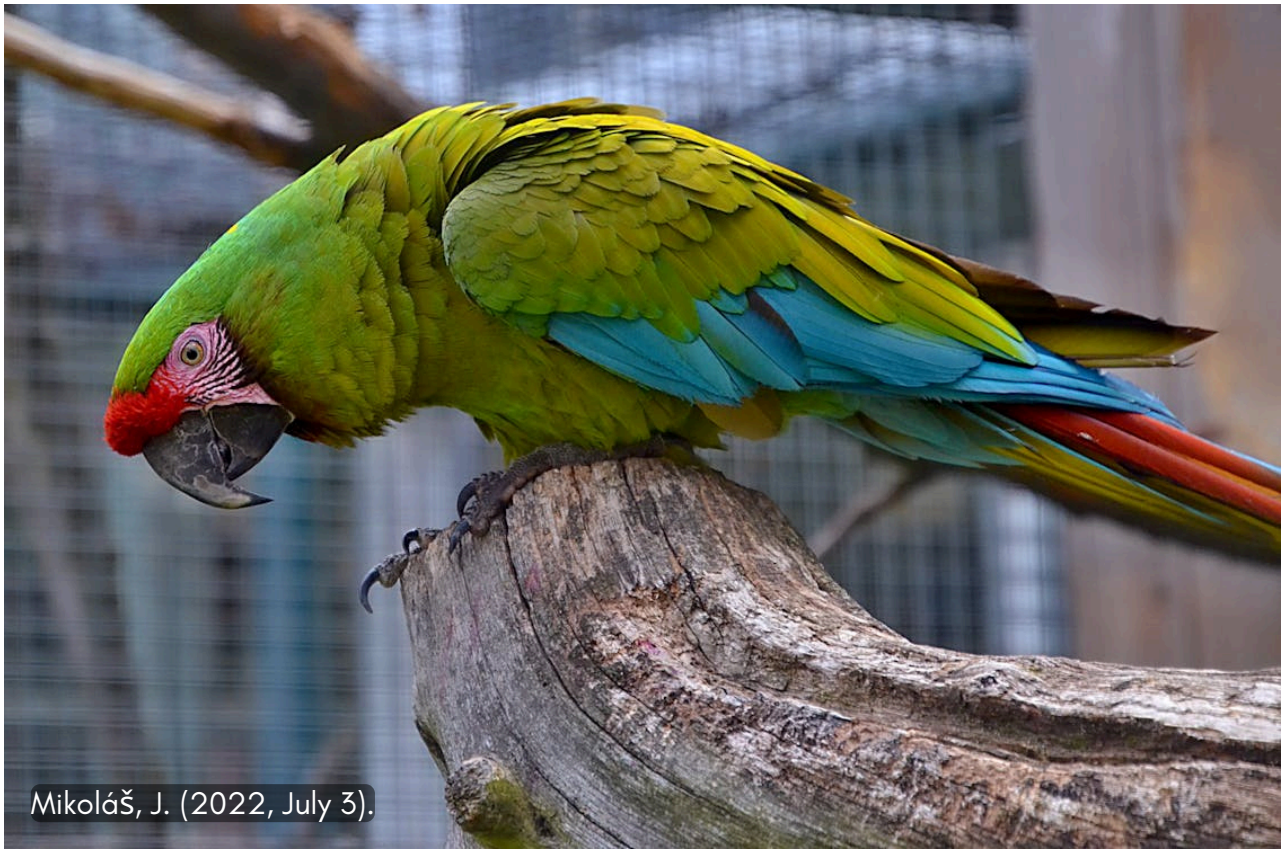
Cultures everywhere have incorporated birds as guiding figures, symbols of strength, and magical beings for centuries. A raven is depicted as a trickster and a creator figure in numerous indigenous cultures. Hinduism and Buddhism value the graceful peacock as a symbol of beauty and art. Cranes symbolize longevity, peace, and good fortune in Japanese and Chinese cultures and the phoenix represents immortality, strength, and rebirth in ancient Egypt and Greece. In Christianity, the Holy Spirit- a symbol of guidance, is represented by a dove. Other examples include when "Black Elk, the Lakota wise man, received his vision from an eagle, while African American Alice Walker found the spirit in domestic hens. A Sufi Muslim epic poem, The Conference of the Birds, uses the species characteristics of thirty different birds to teach its lessons, and both Hindus and Buddhists have comparable books where birds speak wise teachings" (Gardella & Krute, 2024, chapt. 5). Hundreds of examples of how birds hold significance in unique ways can be found in cultures worldwide.

The Native American tradition of honoring eagles has persevered through history as, "Eagles have been viewed as messengers between our world and the spirit realm, protectors and guides of spirits. The possession and use of eagle feathers are highly revered, symbolizing respect and spirituality within tribes. The profound connection between Native Americans and eagles reflects their deep-rooted relationship with the natural world and their rich cultural heritage" (Justo, 2024). The Lakota people of North and South Dakota are a Native American group that recognizes the eagle as a messenger of prayer. It is said that the eagle carries prayers to the Great Spirit and that, "for the Apache tribe, the eagle is known as the master of the sky and represents fearlessness and determination. It is believed that by wearing eagle feathers or carrying an

eagle feather fan, one can harness the bird's strength and courage. These feathers are often incorporated into ceremonial regalia and dance outfits, serving as a reminder of the eagle's powerful qualities" (Justo, 2024).

A Native American scholar discusses what a seemingly uncommon bird means for him. "Seeing Šinkiphsa, or [the American Coot], year after year may not be so exciting to some birders. But whenever I encounter one, I think of the role they play in one of my favorite stories of my tribe and the resilience it took for my ancestors to pass these stories on to future generations" (Kasberg, 2020). Native traditions and recognition of symbols, like the American Coot, have been oppressed for centuries. Now it is fundamental to promote the inherited knowledge that remains to ensure that Native traditions live on.

Birds are not just valued for their symbolism but also for their beauty. The cultural services birds provide extend to thousands of cultures across the globe. Unfortunately, the aesthetic value of many birds has nearly caused their downfall.



Mikoláš, J. (2022, July 3).

# Human Contributions

The blue-throated macaw's (BTM) rare plumage has made it very valuable in the world of pet trade. Unfortunately, "the illegal pet trade [of the blue-throated macaw] decimated the population of BTM when wild birds were caught and sold as pets. An estimated 1,200 or more wild-caught birds were exported from Bolivia during the 1980s, suggesting that the population was formerly much higher" ("About Blue-Throated," n.d.). The U.S. Wild Bird Conservation Act of 1992 and Europe's 2007 ban on the import of wild birds has protected the blue-throated macaws, whose numbers have grown since.

Hundreds of organizations have been formed across the globe to advocate for species that fall victim to captivity and poaching. These groups prove that efforts from humans can have positive outcomes on nature and reverse damage caused in the past. Conservation programs focused on habitat restoration, anti-poaching laws, and breeding programs have played a crucial role in the recovery of blue-throated macaws and other vulnerable bird species. Additionally, awareness campaigns have educated the public about the ethical and environmental consequences of keeping wild birds in captivity or participating in illegal wildlife trade.

People can participate in bird protection by building sustainable and safe nesting boxes and reducing threats to birds such as pollution. A collective effort has shown effectiveness in the conservation of numerous species worldwide, and a continuation of these efforts will have positive results. This applies to all species of birds, regardless of their status as threatened or thriving.

# Conclusion

The importance of birds on Earth and in the lives of humans cannot be overstated. Birds play a pivotal role in creating a healthy environment, contributing to human health and culture, and providing essential ecosystem services that benefit agricultural production, pollination, and pest control. Beyond their practical contributions, birds are also deeply woven into human culture and have inspired art, literature, and spirituality throughout human history. As the world continues to face global challenges such as deforestation, habitat loss, and climate change, the conservation of bird populations is more crucial than ever. Without birds, the balance of many ecosystems would be threatened and the natural balance found in nature would be disrupted. From the world's smallest bee hummingbird, which helps pollinate vital plant species, to the mighty raptors that regulate prey populations, each bird serves a unique and indispensable role in maintaining the health of our planet. As stewards of the Earth, it is our responsibility to protect these remarkable creatures, ensuring their survival for the future. Only by prioritizing the conservation of birds can we secure a sustainable and harmonious future for both wildlife and humans alike.



Elliot, T. (2020, July 7).

# Make an Impact with OneNature

OneNature works alongside local partners around the globe to understand and support the well-being of the people who steward wildlife and natural spaces. Through initiatives like the Wild Happiness Projects and our guide on "10 Ways to Feel More Connected in Your Life," we help individuals and communities rediscover and reinforce their relationships with nature. Birds are an inspiring example of these connections, showing us how deeply interwoven our lives are with the natural world.

We invite you to take steps to connect with the nature around you. Spend time outdoors, listen to birdsong, and reflect on the role wildlife plays in your life. By nurturing these connections, we not only enhance our own well-being but also contribute to the protection of the ecosystems we all depend on. Join us in creating a world where the well-being of all beings is celebrated. Learn more about our work and how you can get involved at https://onenatureinstitute.org/

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