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## A Dance with Cranes: *Grus americana* and the Promise of Wilderness

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A Dance with Cranes:  
*Grus americana* and the Promise of Wilderness

Senior Project Submitted to  
The Division of Social Studies  
of Bard College

by  
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Annandale-on-Hudson, New York  
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## Table of Contents

Introduction.....	1
I. Changing Hearts, Minds, and Hats: Early Years of the American Conservation Movement ....	11
II. Of Cranes and Craniacs: an Interspecies Love Affair.....	21
III. <i>Ex situ</i> Conservation in Context: Placing Costume-rearing and Motorized Migration in a Multispecies Perspective .....	36
IV. Is One Crane in the Marsh Worth Two at the Feeder? The Limits of Restoration in an Entangled World.....	53
Conclusion.....	68
References.....	71



## Introduction.

*“Thus always does history, whether of marsh or market place, end in paradox. The ultimate value in these marshes is wildness, and the crane is wildness incarnate. But all conservation of wildness is self-defeating, for to cherish we must see and fondle, and when enough have seen and fondled, there is no wilderness left to cherish.”*

Aldo Leopold “Marshland Elegy,” *A Sand County Almanac*, 1949

The word “extinction” derives from the Latin *extinctus*, to extinguish or annihilate. It originally referred to the quenching of fire, then grew to encompass material things such as debts, a person, a family line. In time, we required a new vocabulary to describe lost species. Extinction is caused by and yet antithetical to the boundless connectivity of life- with each loss the fabric of life frays, dulls, weakens. Some losses matter more than others, and part of my intention in writing this paper has been to decipher these complex systems of value, care, and action that underpin and shape species conservation.

The crane family, *Gruidae*, are an ancient, primeval group. Fossil evidence is spotty, but suggests the family is some twenty million years old. There are fifteen species of crane, spread out around the globe in a cosmopolitan distribution, present on every continent save Antarctica, and curiously, South America. (Matthiessen 2001) Eleven of those fifteen species are threatened or endangered, these large, strange birds that have long held an exceptional place in human cultures the world over are increasingly out of place in a world of drained marshes, climate change, and disappearance of wild spaces.



In 1942, there were fewer than twenty whooping cranes (*Grus americana*) left on the planet. One of North America's two native cranes, the species had been on the decline since the Pleistocene. Their range had once spread across the prairies of the midwest, south across Mexico, Louisiana, and Florida, but as marshes were drained and forests felled, the crane's presence in the United States was reduced to a single winter habitat on the Texas Gulf Coast. They bred somewhere in Canada, but no one knew where. The bird's extinction had been all but assured by many commentators. As ornithologist Robert Porter Allen wrote in the 1950s,

For almost half a century these birds have been advertised as on the verge of total extinction. As early as 1912 Forbush pronounced them "doomed to extinction," and the following year Dr. Hornaday predicted that "this splendid bird will almost certainly be the next North American species to be totally exterminated." Ten years later, in 1923, an article in *The Saturday Evening Post* actually announced that "the Whooping Crane, perhaps the most majestic bird of all our feathered hosts, has traveled the long trail into oblivion." (37)

Their continued existence defied all bounds of reason, which delighted people, and over the decades, the effort to save the birds grew. In a time when species across all forms of life are disappearing into the black hole of extinction, this story stands out as something different.

This is not a project about extinction, but nevertheless the subject is hounded by it, and I have been as well. Deciding to become an environmental studies major meant immersing myself in some of the darkest subject material imaginable; I knew that of course. Climate change, toxic waste, environmental injustice, our broken food systems, our broken everything systems for that matter, and yes, extinction too, have filled my head for the past four years. Worrying about climate change and ecological devastation is a kind of existential dread backed up by cold hard facts, an anxiety that is externalized to encompass entire earth systems. When I conceived of this

project it was because reading about the (objectively insane) history of whooping crane conservation made me a little bit hopeful. Everyone loves an unlikely success story, one of scrappy resilience, an underdog, the whooping crane is all of that and more.

Beyond a retelling of this history, I intend to provide a measured critique of these programs. How altruistic are these efforts? Do they really constitute innovative and effective conservation, or does the exercise in cultivating wildness amount to little more than elaborate, exacting, and expensive performance art? I approach these questions with a framework based on multispecies studies and an expansive notion of human-animal community.

Whooping cranes are North America's tallest birds, standing five feet tall, with brilliantly white feathers, a ruby red mask and a wingspan of seven-and-a-half feet. They are powerful birds, aggressive and territorial, even described by some as mean-spirited. They have a long neck and long legs and are a great deal stockier than one might imagine. Their bodies are bulky; if you're picturing an oversized egret or heron that's not quite it. When standing, their frame more closely resembles that of an emu. Even so, they weigh only about fifteen pounds. In flight, the wingtips appear, as if dipped in the blackest of inks. Robert Porter Allen, whooping crane researcher and conservationist, wrote in his book *On the Trail of Vanishing Birds*, "When you do spot a whooping crane you wonder how you could mistake him for anything else or anything else for him. He looks like a great, flightless, prehistoric bird, prancing about over the mud flats. His stride, the length and thickness of his neck, and the long, sloping back with its dangling plumes over the tail are completely characteristic." (41) The only remnant population of whooping cranes migrates between northern Alberta and the Texas Gulf Coast, a twice annual journey of over 2,500 miles.



*The migration corridor of the whooping crane, (Pearse, et al 2015)*

The adult crane is a keen hunter and forager, able to eviscerate prey with its strong, sharp beak. In the below painting by John James Audubon in his 1827 collection of paintings and observations *Birds of America*, a Louisiana crane is shown dining on baby alligators. Audubon's portrait is generally realistic, although the black wingtips are visible only in flight. The framing serves to minimize the bird, in order to fit a detailed portrait on one page he had to fold and

contort its form. As in many of his paintings, an examination of details reveals how he worked from dead birds rather than live ones, taking artistic license where he pleased.



*“Hooping Crane” by JJ Audubon from Birds of America.*



The writing accompanying this painting reflects the cavalier attitude of history's most famous ornithologist to the lives of birds he studied. Audubon describes the "majestic bird" with its "beautiful form . . . it stalks over the withering grassing with all the majesty of a gallant chief" and proceeds to describe hiding behind a tree and watching a group digging through the mud. His tone then shifts from description to instruction. "While thus engaged, they are easily approached; for if their heads are bent down they cannot see you, and until they raise themselves again . . . you may advance so as to get within shot." Seemingly dissatisfied with the prospect of shooting just one of these birds, Audubon goes on to describe waiting for the right moment to sound a whistle, "on which they all at once raised their heads to see what the matter might be. I had so fair an opportunity that I could not resist the temptation, especially as several of the birds had their necks so close together that I felt confident I must kill more than one of them." Indeed, he claims to fell seven of the birds with just two shots. This is not the end of Audubon's sage advice, he goes on to write, "when wounded, these birds cannot be approached without caution, as their powerful bill is capable of inflicting a severe wound. Knowing this as I do, I would counsel any sportsman not to leave his gun behind, while pursuing a wounded Crane." It's not entirely clear if he is writing from personal experience, "knowing this as I do" seems to suggest he may have suffered a painful run in.

Audubon's writing reads as frenetic and unfocused, it's widely believed that the stories he purported as factual were not always entirely so, but at the same time he readily admits not knowing information at times. The peculiar quality of his writing is exemplified in another

personal anecdote, one involving his son and a group of cranes. “Notwithstanding all the endeavours of my son, who is a good hand at getting in upon, as well as a good shot, he only killed a young one, which was evidently of that year’s brood,” then the bird was “carefully examined and described, and the skin is now in the British Museum in London. Its flesh was tender and juicy, of a colour resembling that of young venison, and afforded excellent eating.” Such is the life and death of a young crane, skin sent to the British Museum and flesh feasted upon by the Audubons.

I bring all of this up because it cannot be overstated the vast chasm that exists between early notions of natural history and conservation and those of the modern era. The field of conservation is by no means a monolith, but the array of approaches share a foundational history that was born out of the early twentieth century and the sharply defined ecological realities of that period. Audubon was a product of an entirely different era, a time of rampant consumption of resources considered infinitely abundant but before the effects became clear, and while he and his work have an incalculable impact, there is nonetheless a hollow sadness to his prose.

Unlike their relatives the Sandhill Cranes, the birds are non-colonial, meaning that adults do not congregate in groups. They mate for life and only associate with immediate family. In a period of adolescence after fledging and leaving their parents, the young cranes form temporary cohorts of about five to ten individuals. Adult pairs are intensely territorial and establish areas of approximately one square mile as their feeding grounds. They do not hesitate to attack interlopers, sounding loud alarm calls, forcefully batting their wings, and employing their sharp beaks and talons. So, it is advantageous for young, unattached cranes to spend a few seasons in these small groups before finding and bonding with a mate.

This project is an exploration into the conditions under which wildlife conservation first began being practiced in this country, the era of exploitation and threats of extinction that led to the advent of legislation aimed at preserving and valuing this country's natural resources. The remarkable conservation effort that has unfolded since then to protect these singular birds, the extremely dedicated people and unorthodox methodology that brought new vitality to a dwindling population.

The current whooping crane population exists only because of the life's work of countless people, the (unwitting) sacrifice of captive breeding stock cranes that never leave a government facility in Maryland so that their offspring can live free, and a culmination of millions of dollars spent over a period of decades by the federal government and private groups. Few other species have undergone such an intensive conservation effort, which begs the question, why these birds? The logic behind prioritizing conservation of cranes over other species can be oddly circuitous: they are valuable due to their rarity, that is their most prized aspect, and as such are deserving of conservation. As one of the original endangered species protected under federal legislation, whooping cranes are emblems, and their rarity has become as much a part of their identity as anything else. To be clear, this is not an effort on my part to argue that this species is the target of too much conservation, rather I seek to understand the underlying reasons why we choose to try and preserve certain species over others.

By its very nature, wildlife conservation operates on a selective basis. Decisions must be made, often somewhat arbitrarily, about what constitutes an important species worthy of saving, and that is under the assumption that a kind of salvation is even possible. The first documented extinction of a species was in 1627 when the last aurochs, the gigantic ancestors of all modern

cows, perished in the Polish Royal Forests, then about forty years later came the death of the last dodo, the enduring, iconic symbol of extinction. There is ample evidence that these extinctions were far from the first, the disappearance of Pleistocene era megafauna like mastodons, moas, and sedan-sized armadillos coincided quite neatly with the spread of early humans across the globe. However the case is different with the whooping crane: they almost certainly would have gone extinct if not for the intervention of humans, so with that one might imagine a slight shift in karmic balance.

In the first section I provide the necessary history and background information on the state of avifauna in the late 19th century, the fashion industry's use of feathers in hatmaking, and the beginnings of the American conservation movement and early environmental legislation. The next piece covers the period from about the 1940s-80s with a focus on two figures. Ornithologist Robert Porter Allen's early work and his years-long hunt for the whooping crane's nesting grounds marked the beginnings of the conservation and reintroduction programs. This is a period defined by an increased intimacy between the birds and the humans studying them, humans raising chicks without the parents, culminating in the remarkable cross-species love story between ornithologist George Archibald and the female crane he wooed and formed a pair bond with. Chapter three delves into the next period in the history, when artists became involved in the project and covers the development of the costume-rearing and motorized migration strategies. Chapter four brings the history up to the present day, with the increased threat of climate change and sea level rise and the shuttering of the migratory project several years ago, what does the future of whooping crane conservation hold? This chapter intersperses this research with my personal experience traveling to see the cranes.



This thesis asks many questions, and answers precious few of them outright. My hope is that this piece can serve as a study and meditation on the contradictions and entanglements of conservation in practice, encouraging new perspectives and prompt evaluation of biases.

**I.****Changing Hearts, Minds, and Hats: Early Years of the American Conservation Movement**

At its height the plume trade was global, with birds from all corners of the world flooding toward urban fashion markets. While the industry in London and Paris comprised a huge portion of the devastation to bird species, in this chapter I have chosen to focus my attention on the American market for the sake of clarity and cohesion. There are strong parallels between the British and American reaction to the plume trade, as in both countries women made up a large portion of activist groups and played essential roles in the establishment of both the Royal Society for the Preservation of Birds and the Audubon Society. The United States can be distinguished from other nations as both a source of plumes and market for hats, with a great deal of the birds originating from Florida. (Davis 2005)



*Turn-of-the-century hats featuring both whole taxidermied birds and individual plumes.  
(Images sourced from the Library of Congress archives.)*

As concern over the impacts of the plume trade mounted, states responded with restrictions on hunting and trading, but these were largely ineffective in the absence of federal legislation. The Lacey Act, passed in 1900, was the first federal law that sought to seize control of the rampant destruction of American avifauna. The law both provided funding for restoration efforts of decimated populations and established restrictions on interstate sales of “dead bodies or parts thereof of any wild animals or birds” killed in violation of a state law. (Doughty 1975, 109-10) This broadened federal power over interstate commerce and effectively redefined the government’s role in American’s relations with the wildlife we share this country with. By placing wild birds under the purview of the Department of Agriculture, lawmakers further codified the government’s place as acting as stewards to wildlife, a Progressive ideal that had already led to the establishment of the first national parks in the last decades of the nineteenth century.

The supporters of the law encompassed the sort of duality Teddy Roosevelt became synonymous with-- the confluence of hunter and conservationist, united in the pursuit of a mutual goal. The law led to an immediate reevaluation of milliners’ business practices. The federal government began seizing shipments of feathers bound toward urban centers, and an industry that had thrived on illegal plumage sourced through overhunting and poaching, operating on the edges of state jurisdiction found itself in an entirely new situation. The restrictions on interstate trade in tandem with new laws passed by individual states did not significantly curb the industry. Workarounds were simple, for instance in 1910 when New York outlawed importation of feathers from other states, milliners picked up and moved their

operations to Pennsylvania, or simply began buying their plumes from European markets, which sourced from poachers in Florida. (Davis 2005, 248)

The situation in Florida grew increasingly contentious in the first years of the 1900s. The devastation to the state's bird populations was widely apparent, and the decimated egret rookeries were of particular concern. The hunters generally shot all adults in a rookery (both male and female egrets assume the prized aigrettes as breeding plumage) and took only the prized plumes, leaving behind mutilated bodies, smashed eggs, and dying chicks. (Davis 2005, 245) In this case the egrets' previously successful evolutionary mechanisms, dramatic breeding



plumage and colony-style living, were suddenly the traits that put them in a perilous position. Placing the blame of these destroyed egret families squarely on the ladies buying and wearing the hats presented a stark contrast to the archetype of society woman. The moral foundation of the argument against plume hunting was born out of this tension between the brutality of the

industry and the idealized vision of a virtuous Victorian woman. (Price 1999) Political cartoons of the era removed the supply chain and pictured women holding guns, or even as birds of prey themselves.



Above, this political cartoon by Linley Sambourne appeared in *Punch*, in 1892. Captioned “A Bird of Prey,” these arguments over the hat-wearers’ ultimate responsibility proved lasting. On the previous page is a cartoon with a nearly identical sentiment, Gordon Ross’s “The Woman Behind the Gun” appeared in a 1911 issue of *Harper’s Bazaar*. Sourced from the Victoria and Albert Museum online archives

The role of women in the early years of the American conservation movement cannot be overstated. With the millinery trade a central target of criticism, attention fell on the customer base, chiefly women of the upper class. Critics were severe and significant blame for the birds' destruction was foisted upon the women wearing the hats. (Hanson 2011, 188-90) While this reasoning failed to encompass the larger economic forces at play, not to mention the many men supportive and instrumental to the trade, it nonetheless proved effective. This tactic was employed by Frank Chapman, ornithologist, conservationist, curator at the American Museum of Natural History, and originator of the Audubon Christmas Bird Count, when he started *Bird-Lore* in 1899.

Chapman had long been a critic of the plume trade's impact on avifauna. Somewhat infamously, in 1866, he had observed over a period of two afternoons walking through a New York shopping district, over five hundred hats featuring feathers. Of these he identified 160 North American species. (Mearns 1998, 11-12) Over thirty years later, the trend had only grown in popularity.

Designed for a popular readership, *Bird-Lore* filled what Chapman saw as a much needed market for writing about birds. In the five years prior to the journal's founding, publishers in New York and Boston had sold over 70,000 bird texts, indicative of a strong appetite among the general public for more bird-centric writing. The journal aimed to combat the plume industry by instilling a greater appreciation for the natural world, especially amongst young people, through a sentimental evocation of the intrinsic value of birds.

The magazine's writers included those at the forefront of the conservation movement such as Florence Merriam Bailey, John Burroughs, and Olive Thorne Miller. Burroughs pulled

no punches, writing, “I am told of one middleman who collected from the shooters in one district, in four months, seventy thousand skins. It is a barbarous taste that craves this kind of ornamentation. Think of a woman or girl of real refinement appearing upon the street with her head-gear adorned with the scalps of our songsters!” (Doughty 1975, 54)

Bailey had published what is widely considered to be the first modern field guide in 1889 at the age of 26. In *Birds Through an Opera-Glass*, she advocated for a radical new approach, rather than shooting a bird to learn about it, an interested person might just sit and observe the creature in life. Swapping guns for opera-glasses was the same rationale Chapman used in founding the Christmas Bird Count as an alternative to the traditional hunting parties of the season, appreciating the birds without possessing them.

Bailey’s approach was pioneering, but her opera-glass, a precursor to the binoculars, in many ways symbolized the class dynamic at play in the debate over the plume trade. This was an issue that chiefly concerned the upper classes, those who could afford opera glasses, or alternately hats festooned with feathers. The luxury industry of the plume trade supported a veritable army of people who killed and collected the birds and brought them to millinery centers. This vast web of actors were not interested in seeing their livelihood fall victim to what they perceived as needless meddling.

These complications along class lines provided trade groups with talking points that slowed the movement. The *Bird-Lore* writers and other conservation advocates were called “misguided elitists” who had no regard for either the plight of the common man or for the importance of a historic industry. Battle lines were drawn, with the interests of industry groups staunchly opposed to the goals of newly formed Audubon societies. (Davis 2005



The Florida Audubon Society formed in 1900. The organization's original members were primarily women and was largely composed of the social elite. They lobbied state lawmakers, who passed a law in 1901 prohibiting the killing of nongame birds. The fine was only five dollars (plus the confiscation of illegal material) and failed to establish real enforcement measures. The idea of paying people to patrol state and federally held land did not become mainstream until the establishment of the National Park Service and its rangers in 1916.

Florida's refusal to hire game wardens did not deter the members of the Audubon society. In 1902 the National Audubon society began paying four wardens to enforce the law in the Everglades. Within six years, two had been killed by plume hunters. The first was Guy Bradley, a hunter turned environmentalist who became a martyr of sorts when he was shot and killed while arresting Walter Smith, a well-known hunter who was never convicted. (Doughty 1975, 111) Despite widespread publication of the story and increased urging by Audubon societies, demand for egret plumes and other feathers to adorn hats did not falter. Not until the 1940s did the market completely dry up, as changing fashions, class symbols, and a wartime mentality made lavish hats unnecessary and old fashioned. In 1943 the formation of the Florida Game and Fish Commission also served to curtail plume hunters, but the effort amounted to too little too late as the particular threat of the milliners disappeared. (Davis 2005) As that threat vanished, however, the impact of land development, wetland drainage, and an increased population became much more dangerous.

Between their size, ferocity, and proclivity for solitude, Whooping Cranes were not a primary target of plume hunters. A more significant obstacle for the species in the first decades of the twentieth century was the electrification of rural America. As power lines were erected



across the landscape, whooping cranes fell victim to this unexpected threat, an issue that continues to be a main reason of mortality to this day. (IUCN red list) In an ironic twist, one of the major threats to the cranes in this period was shooting and egg collecting by those working for natural history museums. These institutions had panicked when word of the species' possible impending extinction was publicized, and were scrambling at the prospect of the bird going extinct without first getting a sample for posterity. (Kaska 2012, 63)

In *Feather Fashions and Bird Preservation*, Robin W. Doughty describes a cultural shift undergone in the first fifteen years of the twentieth century, with public opinion increasingly favoring conservation measures and the protection of wild bird species. State Audubon groups gained traction and vital habitats were preserved as sanctuaries under federal, state, and local jurisdiction. Included in the Tariff Act of 1913 was a provision banning the importation of “aigrettes, egret plumes or so-called osprey plumes, and the feathers, quills, heads, wings, tails, skins, or parts of skins, of wild birds, either raw or manufactured” except for scientific or educational purposes. This provision was the subject of great debate and the millinery industry lobbied hard against it, at one point succeeding in weakening it through loopholes. However, President Woodrow Wilson's support of the cause and the persistence of several senators, culminating in a five-hour hearing, resulted in the passage of a version that did not bend to industry interests.

The Migratory Bird Treaty Act of 1918, a revision of legislation originally from 1916, provided the most significant protections for North American birds to date. The act made it illegal to “take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the

terms of a valid Federal permit.” (US Fish and Wildlife) The Lacey Act had established federal enforcement of state restrictions on bird hunting, but the MBTA was the first to place avifauna in the custody of US federal authority.

The plume industry was not defeated by legislation or increased interest in the lives of birds, nor by the extermination of coveted species. In fact, the reason was much simpler, the feathered hats went out of style. Between changing customs and a cultural shift away from the ubiquity of hats, the force of fashion proved ultimately more effective than any appeal from conservationists. These hats were of a Victorian-era style and were what one’s grandmother might wear. The dramatic female silhouette emblematic of the time - made possible by whale-bone corsets and huge hats to emphasize the head and face - was both impractical and excessive, not conducive to a time when concerns over war abounded, and women were increasingly joining the workforce. While figures like Bailey and Chapman did eventually see their goal realized, it is important to note the factors that caused that shift. The outbreak of World War I decisively marked the end of the plume boom, and while it falteringly continued, the dye has been cast, and the industry was soon all but completely gone. (Doughty 1975) This instance of accidental victory speaks to the limited effect of scolding personal behavior when it comes to environmental issues. The weaponization of shame by writers and activists and feather boycotts among members of the upper echelons of society did change hearts and minds. The legislation enacted at the state and federal level did curb the trade to a degree. Still, none proved powerful enough to bring about the demise of the industry altogether.

The years of concerted activism were certainly not for nothing and did instill a wider sense of nature’s intrinsic value. The anti-plume trade movement was an early flashpoint of what

would become the American conservation movement, laying the foundation for future wildlife and habitat protection. The reframing of natural resources from strictly potentially economic materials, to something to be cherished for future generations, was a sea-change. It was this shift that created the conditions that led to, in the 1940s when whooping crane numbers were at an all-time low, a monumental conservation effort to save the species.

## II. Of Cranes and Craniacs: an Interspecies Love Affair

Whooping crane conservation in the period between the 1940s and 1980s saw the species protected by federal legislation as one of the first official endangered species. The Endangered Species Act went through several iterations in the 1960s, with the most powerful legislation enacted in 1973. Providing direct protections for imperiled species and their critical habitat, the ESA is a vital tool of the federal environmental policy. (Manupipatpong 2015) Over this period, the cranes began their slow creep toward a sustainable population, made possible by the work of many dedicated individuals. This section concerns the work of two of the most famous champions of the whooping crane, Robert Porter Allen and Dr. George Archibald.

Described as a “crane zealot,” (Doughty, 8) Allen was the first, most forceful advocate for the whooping crane. His work in demystifying aspects of the birds’ lives began in the 1940s and included finding their previously unknown summer breeding grounds, a critical step in aiding the conservation effort. His 1957 book *On the Trail of Vanishing Birds* chronicles his work in studying and restoring the whooping crane and other threatened bird species.

Allen was largely self-taught, passionate about birds and less so about school. He began working for the National Audubon Society in 1930, and was made head of the new sanctuary acquisition division in 1934. His work took him to Aransas, Texas, where he became enamored with the roseate spoonbill- a strange, beautiful bird with feathers the color of cotton candy- and another species devastated by the plume trade. The Aransas National Wildlife Refuge was established in 1937, ensuring the protection of critical habitat for numerous wintering waterfowl,

and 1945 marked the dawn of the Whooping Crane Project, a cooperation between the USFWS and the Audubon Society.

Beginning in 1947, Allen devoted himself to an intensive study of the cranes. At this point, there were fewer than twenty of the birds left, and many aspects of their lives and behavior were still shrouded in mystery. Allen's love for the whooping cranes reminds me of the way Jane Goodall talks about chimpanzees, a dedication both professional and deeply personal. He writes of their “invincible will to survive, against all the accepted rules of biological inevitability” and efforts to “perpetuate his noble existence, by whatever means we have at hand.” (Allen, 34) He studied them as individuals, through hundreds of hours over a period of years spent holed up in a bird blind, then through tracking them through Canadian backcountry.

The cranes' intensely territorial nature was already apparent with the tendency of pairs, families, or groups of adolescents to remain within the “invisible boundaries” (43) of an approximate square mile zone of salt marsh for the entire winter. Adding to this research, Allen was the first to document that the same cranes returned to the same territory each year, that they mated for life, and in the case of one member of a pair's death, the other would mourn and never form another pair bond. He observed how crane mothers would hunt for food for their young, smash open the crustaceans, and then have the chick dig it out of the mud to teach the behavior.

But, as Allen writes, understanding the crane took much more than field observation of behavior, scientists needed to understand the constellation of other factors that made the salt marshes desirable. In the past, if an ornithologist wanted to know the diet of a particular bird they shot it and cut it open to poke around its stomach. With critically endangered species like the spoonbill and whooping crane, this method was simply untenable, so Allen relied on

intensive observation to gain an understanding of the minutiae of the birds' diet. (Audubon '08, 8) This approach represents the paradigm shift transforming ornithology at this time, built on the study of live birds rather than dead ones. The detailed eye with which Allen perceived the cranes is evident in his description of the beginning stages of the mating dance, a behavior he deems "one of the great dramas of the bird world."

It may begin quite suddenly, as the family group is standing idly on a ridge of salt-flat grass, preening their feathers. The male bird turns, walks off into the shallow water, and stretches, raising his wings over his back, bending forward slightly as he does so. All at once he starts to dance, bowing toward the female, who now steps into the water beside him. Raising his satin-white wings with their jet-black tips to the fullest extent, he leaps high in the air, executing a half turn before landing. The female is now in the formalized attitude of a dancing crane, her neck arched, wings and plumes slightly raised, whole body stiff and yet graceful, like that of a ballerina. (57)

Allen's detailed and evocative descriptions capture the birds' spirit in a way that scientific study often avoids. His writing is attuned to the drama of it all, and to me reads as actively working to drum up interest in the species. Allen hones in on aspects of what is so compelling about the cranes-- family structure and dancing-- and conveys very well his wonder at it all. In this, Allen's enthusiasm for these birds is infectious. Although the majority of his readership would probably never see a whooping crane for themselves, his writing transports one to a salt marsh, where the birds pirouette and plié through the mud.

Another critical aspect of Allen's work at this time was observing and documenting the makeup of the salt marshes, a delicate balance of brackish water fed by freshwater inlets and the sea. Drought has proven a persistent challenge to this day, when the water becomes too saline for the cranes to ingest, and the environment no longer supports the crane's prey, they are forced to

move inland where they face a greater risk of predation from bobcats, coyotes and wolves. Now when drought strikes at the Aransas salt marshes the refuge provides the cranes with fresh water, a task which will no doubt become more important as sea level rise results in increasing salt intrusion.

These environmental threats paled in comparison to the stress people placed on the cranes, especially true during migration. Each year while the cranes migrated, people along the route shot them, a threat that actually increased even as the birds' plight was widely advertised. There was a sense among many farmers along the route (in both the US and Canada) that the cranes were proving more trouble than they were worth, and that a better solution than the government spending taxpayer's money on some doomed bird would be to shoot the rest of them and put the whole matter to bed. One letter to the editor reprinted by Allen reads, "From what I have observed and read he is a dim-witted gawk of a bird whose pate has become more or less addled in the course of time until he is not quite sharp enough mentally to be up to the fundamentals of procreation . . . as far as extinction is concerned the sooner the better." (75)

After significant losses during migrations in the early 50s, the National Audubon Society launched a new program in 1953 to reach every person living along the 2,000 mile migratory journey of the cranes with the aim of drafting them as supporters rather than outspoken enemies of the species. That autumn as the cranes began their trip south, state game commissions published information, newspapers and televisions were blanketed with public service announcements, and materials were distributed to schoolchildren. This collective effort proved successful and for the first time since 1949 and only the fifth year on record, all the cranes safely reached Texas.

During this period, Allen also surveyed vast stretches of the Gulf Coast by airplane in search of as-yet undiscovered crane territory, efforts which turned up nothing. The Aransas cranes were indeed the last of their species, making it even clearer that in order to save the species, their summer nesting grounds would need to be found. (Allen 47) The years-long search for the crane's summer home has been well documented and is central to three texts I consulted. Allen's *Vanishing Birds* provides a first-hand account, while *The Hunt for the Whooping Crane: A Natural History Detective Story* by J.J. McCoy and *The Man Who Saved the Whooping Crane: The Robert Porter Allen Story* by Kathleen Kaska also chronicle the effort. The first attempts at finding this mysterious place began in 1945, and while the possible range had been narrowed down to Saskatchewan, Alberta, or Manitoba through process by elimination, there remained the enormous task of further honing that information.

In 1947 Allen joined the effort. He drove from Texas with family in tow to relocate to their new home in the Canadian bush country. Over the next few seasons Allen and his partner Bob Smith flew thousands of miles over the Canadian wilderness searching for the cranes. Much like a needle in a haystack (hundreds of thousands of square miles of haystack) the task of finding a handful of birds in these vast undeveloped tracts of land appeared next to impossible.

Allen was undeterred by these years of failure, and his unwavering optimism and can-do attitude reads clearly in his writing. The chapter detailing the ultimate victory of this effort is entitled, "We find terra incognita!" and opens with a section of a Yeats poem, ". . . I have looked upon those brilliant creatures,/And now my heart is sore." Years of effort had turned up nothing, but the situation changed at once in 1954 when a fortuitously located forest fire broke out in the remote Wood Buffalo Park in northern Alberta. Officials aboard a helicopter surveying the



damage spotted a pair of large, brilliantly white birds with a brownish chick. By complete accident, the location of the crane's elusive summer stomping grounds was demystified. The exact location was not yet known, and a ground survey had to be delayed to the following year. So it was not until the summer of 1955, after nearly a decade of intensive study, that Allen finally laid eyes on a wild whooping crane on its nest.

Whooping crane pairs typically nest in the same place each year, usually along the margins of lakes or marshes in shallow water to protect from predators. Measuring two to five feet in diameter, the nests are made of bulrush and cattails. Eggs are typically laid in April, and the parents trade off incubating the egg, with the other keeping watch. (Johnsgard 1983, 190)



*An aerial photo shows the remote freshwater ponds where the whooping cranes summer, two cranes can be spotted in the leftmost pond. Photo taken by Tom Lynn, courtesy of Audubon Magazine.*

Despite the eternal sense of optimism that shines through his work, Allen's account of those penultimate days of the search betrays a certain frustration. Traveling on ground, all the bushwhacking, mosquitos, and other inhospitable features of the region meant a great deal of discomfort for fleeting glimpses of the cranes. "In that confusing patchwork of lakes and ponds, amid soft bogs and dense thickets, we soon had the feeling of being hopelessly earthbound. . . . It was maddening to know that at least one pair of whooping cranes, with young in tow, were within a half mile of us most of the time, yet we were unable to watch them." (231)

Without in any way casting aspersions on Allen's pioneering work, I would nevertheless like to briefly dissect this note of possession in his account as I think it speaks to a certain universality. Yes, it's natural to want a greater sense of pay-off after years of work, but in this case why is it not enough to simply know the bird's location, what is behind that compulsion to see and photograph and possess in this way? We can tell ourselves the purpose behind conservation is pure altruism, but then why do we tend only to want to protect the creatures we also like looking at?

The pure, almost childlike enthusiasm Allen had for whooping cranes was infectious, and Kaska writes that his friends joked he "could walk into a room of adversaries and have them questioning their lifelong beliefs in less than five minutes." (4) His devotion to birds is evident in his writing, and *Vanishing Birds* won him the 1957 John Burroughs Award for outstanding nature writing. This enthusiasm continued after his retirement from fieldwork in 1960, with the publication of two more books on birds. In 1963 he was in the process of writing a planned sixteen volume series *Birds of the World* when, at the age of fifty-eight, he died suddenly of a

heart attack. (194) The whooping crane would not see a more active crusader for their well-being until George Archibald.

Dr. Archibald is a semi-legendary ornithologist and global crane advocate. He co-founded the International Crane Foundation in 1973 while studying for his PhD at Cornell, and was the director until 2000. Over the course of those 27 years, he pioneered many novel methods of raising cranes in captivity, and continues to work as a global advocate for cranes. He is most famous for his role in a bizarre interspecies love story. While Archibald did not become involved with cranes until the 1970s, one cannot tell his story without first beginning in 1967 when a female whooping crane chick hatched at the San Antonio Zoo. Her name was Tex and unfortunately, due to the circumstances of her first formative weeks, did not think of herself as a crane, but rather as a human.

Her parents, a pair that had once lived in the wild, were quickly deemed unfit after the female sat on Tex's sibling, accidentally killing the valuable chick. (Mooallem 2013, 217) This sort of failure was not uncommon in captive whooping cranes, due to their lives spent in captivity and overexposure to humans, they simply did not possess the skills necessary to further their species. At this point, this pair of birds had produced over fifty eggs, some of which had hatched, but each one had ultimately died. The responsibility for these failures is split. Yes, the birds were inept parents, but the terms of their captivity was not conducive to success, and the zoo did not know how to care for them properly. (ICF 2010, 0:50)

It was vital for these captive cranes to reproduce because of the diminished wild population and the threats of a shrunken genetic pool. Concerns about genetic diversity have been a consistent aspect of whooping crane conservation, attempts to reinvigorate the species

would be for naught if the resulting birds were too inbred to function in the wild. Tex represented a significant asset to her species at large, since her parents had been taken from the wild decades earlier, her genes represented material that was no longer in the wild population. So much rested on this tiny chick and researchers were not going to take any chance with her survival. So, she spent those first formative six weeks of her life in a cardboard box in the zoo director's living room. This was heralded with a brief mention in *The New York Times*, "Whooping Crane Boxed In." These circumstances meant that as Tex reached sexual maturity, she refused to show any interest in males of her species and instead only had eyes for human men, specifically dark-haired white guys of medium build. (Mooallem 2013, 218)

The role of imprinting is important in the development of birds, not just in the formation of the parent-chick relationship as was widely believed, but rather throughout their development, the specifics of which vary from species to species. For some, such as the whooping crane, imprinting "plays a profound role in establishing a bird's understanding of its broad social group" (van Dooren 2014, 95) and is considered by ornithologists to occur in two stages, the first in the early days of life and the second at approximately ten to fourteen weeks when the birds are on the brink of fledging. This second instance of imprinting, often called sexual imprinting, solidifies the young bird's notion of what constitutes a good mate and plays a role in the learned behavior of migration. (van Dooren 2014, 96-7) In the wild, this essentially manifests in the patterning of behavior on one's parents, a relationship and bond that is made much more complex as soon as humans begin to interfere. The cranes' slow development and prolonged adolescence is the heart of the issue with captive-release efforts. While many species come into the world with quite a high degree of competence, whooping cranes are closer to humans in this

respect. Like us, they require a great deal of time and effort to aid in their development. Simply put, they are not born cranes but rather become such through learned behavior. The whooping cranes' remarkable ability to imprint on just about anything that moves has been tantamount to the conservation effort.

After Tex's stint at the zoo director's home, she was transferred by government order to a facility in Maryland where, for the better part of nine years, researchers tried in vain to breed her with other cranes captured from Canada. But Tex was utterly uninterested in the parade of cranes brought before her, and hope waned of ever being able to use her genes to diversify the wild population.

Enter George Archibald. In 1976, three years after co-founding the ICF, the crane biologist posited that Tex, now nine-years-old, be transferred to his facility in Baraboo, Wisconsin where he was in the process of assembling pairs of each of the world's fifteen species of crane. Archibald suspected that he could coax her out of her shell.

Upon Tex's arrival in Wisconsin she showed an immediate affinity for Archibald, as he had hoped. He happened to be her type, that being a dark-haired white guy of medium build. Artificial insemination alone was not sufficient to get Tex to reproduce. The elaborate courtship dances catalyze essential hormones that allow the bird to reach a state where reproduction is possible. Tex would not be able to bring any more cranes into the world without first finding love, and Archibald was just the man for the job.

As soon as she was brought to Wisconsin, he moved in with her, setting up his office in her enclosure and spending every day in her company. She was smitten and formed the necessary pair-bond with her idea of a perfect mate. In an interview, Archibald, a modest, unassuming

figure, reflected on the formation of their bond, “I spent a lot of time with her that summer, and she really bonded, so I could be away for months and come back and she would still be fired up. So then I would work with her in the springtime, every year. What daily life was like with Tex? I would arrive at her enclosure at about five o'clock in the morning, before it was daylight, and open the door, and we would walk together to the top of the hill. And I would leap around, doing deep knee bends and running with her, and it was actually quite exhausting, but it was sort of fun to wake up and to dance with a crane.” (ICF 2010, 1:57)



*George Archibald and Tex frequently went on long walks together.  
Image courtesy of the International Crane Foundation website.*

Archibald spent years trying to produce viable offspring with Tex; each spring they would find a site together and build their nest, he would arouse her with dancing and then she would be surreptitiously artificially inseminated with sperm flown in by the federal government from a Maryland facility, but every year something would go amiss. In 1977, the first spring, the egg was infertile due to the poor quality of the sperm, then the next year the chick died just before hatching. Then Archibald, busy with his international work with other crane species, took two springs off, returning in 1982. He spent six weeks in the field with his lady love, resulting in their union's only offspring, a male chick hatched in June. Archibald named him Gee Whiz. He notes that all Tex's eggs, including the one that became Gee Whiz, were wrinkled and misshapen, and as such a great deal of care was taken to ensure its hatching. Tex was not allowed near it, after she laid the egg it was placed in the nest of a "very reliable" pair of sandhill cranes at the ICF. After the egg was measured and found to be very underweight, it was transferred to an incubator.

The last days of the egg's incubation were chronicled in "Peeping in the Shell" a 1983 piece in *The New Yorker*. Writer Faith McNulty had written a book on whooping cranes in 1966, and had already written a brief *New Yorker* profile of Archibald, entitled "Crane Man." So, when he called her urging her to fly from Rhode Island to Wisconsin to bear witness to the egg's hatching, she dropped everything and flew across the country at once, arriving in Baraboo seven hours after the call was placed.

Peering in [the incubator], I see a brown-speckled greenish egg, about five inches long, cradled between two scraps of foam rubber. I am reminded of those big white Easter eggs that have a window in one end. I wish this one had a window; the gray-green shell guards its secret closely. Round end facing us, the egg rests mute, motionless, enigmatic. It might be an artifact in a museum case. George points out a vital sign I've missed: a dime-size area of

shell near the end shows a network of cracks, and at the center of the fracture there is a tiny puncture. The chick had pipped.

Years of work and thousands of hours put into this interspecies union had, at last, yielded a member of a new generation. McNulty describes the “groggy triumph” of the chick as he stands after hours of slowly making his way out of the shell. But, as further evidence of the species’ inability to catch a break, a mere three weeks after Gee Whiz hatched, a pack of raccoons broke into Tex’s enclosure and killed her. Archibald received this news on his way to appear on *The Tonight Show* (Mooallem 2013, 219) and his announcement of her demise on national television transformed the spot from a quirky human-interest story to be poked fun at, to a poignant, sympathetic message that resonated with audiences across the country and propelled the bird into a larger public consciousness. All that remained of Tex was her beak the morning after the attack, but since the precious chick Gee Whiz was housed elsewhere, he survived, and still lives at the ICF. Gee Whiz has sired over one hundred whooping cranes, including the first female raised in captivity to reproduce in the wild.

To me, what is most remarkable about Archibald is the dramatic range in scale of his work. He is truly an advocate for cranes at both an individual and genus level. Along with his years of dedication to Tex, his work with the ICF has sought to form partnerships among nations not prone to cooperation in the goal of protecting the cranes that migrate between them. This has taken him to every continent where cranes live, and into places like the Demilitarized Zone between North and South Korea. In the 1982 *New Yorker* profile he sums up his strategy:

Rivalry can work in the birds’ favor. If the Chinese hear that the Soviets have banded six birds, it inspires them to band ten. I’m hoping that, bit by bit, I can get the scientists talking to each other. It seems weird that this little organization thousands of miles away in Baraboo, Wisconsin, is the only contact between biologists in



neighboring countries. Except, of course, for the cranes themselves, which fly over the borders without giving it a thought.

Attuned to the, at times, self-serving quality of this conservation work, Archibald uses it in his favor, presenting an opportunity to use the imperfect human dimensions of conservation for the sake of the cranes' welfare. Archibald continues to be one of the world's preeminent crane experts, and has been the recipient of numerous awards for his contribution to the field, including a MacArthur Fellowship, the Order of Canada, and the inaugural Dan W. Lufkin Prize for Environmental Leadership from the National Audubon Society. (ICF, n.d.)

In a blog post to the ICF website posted in April, 2020, Archibald describes spending time under the Covid-19 stay-at-home watching an unusual threesome of whooping cranes. Of the trio's odd behavior, he writes, "A veritable soap opera ensued during my observations, including territorial unison calls, chasing away encroaching Sandhill Cranes, nest building (plural)" between two males and one female, all of whom had been raised in captivity and then released. Whether their strange behavior can be accounted for by these origins is not noted by Archibald, who instead offers methodical observation without commentary. As one of the originators of the captive-breeding programs, I would imagine he might feel conflicted about how the whole thing has played out, with many of the cranes simply unable to care for themselves or their progeny in the wild.

Even still, the program has also found great success, and this continued muddled effort speaks to the thesis of Donna Haraway's book *Staying with the Trouble*, one that emphasizes the positive interspecies connections that can be forged amidst the mess that is this era of anthropocene and mass extinction. Put very simply, conservation is messy and unpredictable work, but is meaningful in part because it uses the web of connections between species for good,

rather than exploitative purposes. Within this framework, in the next chapter I explore Archibald and his colleagues' work to find new and better ways to raise whooping crane chicks in captivity - without them turning out as socially and sexually confused as Tex- along with other attempts to "re-wild" captive-raised birds.



*George and Tex dance together. Image from the ICF website.*

### III.

#### ***Ex situ* Conservation in Context: Placing Costume-rearing and Motorized Migration in a Multispecies Perspective**

Both Allen and Archibald's work were marked by a high level of intimacy with the birds, and the conservation effort continued that legacy with a fervor. This concept of cultivating, even engineering, wildness appeared achievable. As with any experimental effort, only in the fullness of time did the program's shortcomings and blindspots become evident. Captive breeding and motorized migration bridge the space between *ex situ*, "off-site," conservation and the wild. *Ex situ* conservation is based on a principle of conserving individual species rather than systems, an approach used across the plant and animal kingdoms in the form of zoos, gene and seed banks, and other controlled preservation. (Ryder 1995, 105-6) Focusing on a species outside of its environment necessitates a certain level of decontextualization, and rejoining the species and environment does not always play out as expected.

In order to make sense of the entwined underpinnings and ambitious goals of this work, I turn to Clare Palmer's discussion of wildness and ethics in a framework she terms the "laissez faire intuition," in *Animal Ethics in Context*. She investigates the discrepancy between ethical obligations felt toward domesticated animals and the absence or limited scope of those felt for wild animals. Palmer posits that wildness is a three-dimensional construct: constitutive, locational, and dispositional/behavioral. These ethical entanglements manifest differently and are dependent on both these conceptions of wildness, and the placement of the species in question on the wild-tame spectrum.

Whooping cranes, for all their enduring symbolism of wild creatures and spaces, represent a kind of spatiotemporal hybridity in this respect. As environmental anthropologist Thom van Dooren explores in his piece “The Violent-Care of Captive Life,” the success of the species’ restoration in the wild comes at the expense of a number of what he terms sacrificial surrogates. These surrogates include members of the species that live out their lives as captive breeders, serving the practical purpose of maximal propagation. These birds live in grassy, fenced-in pens, are not allowed to tend to their eggs or chicks, and have their wings pinioned, inhibiting their ability to dance. These measures serve to sever the birds from all that makes them cranes, and as it has become increasingly evident, their offspring suffer for it.

This is the heart of that spatiotemporal hybridity, the same cranes are considered varying degrees of wild depending on both their physical location and stage of development. As an example, in the Operation Migration project, the young cranes were kept in highly controlled environments along the route. In addition to being fed and watered each night, cranes that flew off course would be retrieved and driven to the correct place. (Johnsgard 2011, 66) At the end of the migration, with the cranes having been taught this last important skill, they were considered sufficiently wild and able to live on their own.

There is more than a little arrogance behind the notion that people dressed in costumes can raise crane chicks in captivity to become functionally wild. As I have already explored in the discussion of imprinting, whooping cranes are not born as such but are rather blank slates that must learn to become themselves. The history of the captive-release program certainly reveals efforts made to maximize authenticity, but one cannot evaluate the successes of the program without also including its ethical, practical, and conceptual shortcomings. I have found that a

multispecies perspective is helpful in evaluating this messy history, especially as it concerns a critical reconfiguration of traditional nature/human dichotomies. Multispecies studies in action can be described as “staying with the trouble.” Haraway’s theory of mutual self-making in our era of messy entanglements she calls the Chthulucene. (2016) Learning to work in and with our deeply imperfect world with the acknowledgement it will remain imperfect, or “the proposition that there is no space outside the action from which to gain absolute or universal knowledge, and yet we must still act.” (van Dooren et al 2016, 15)

Drawing on van Dooren’s analysis and Haraway’s notion of “staying with the trouble,” this chapter will explore the captive-breeding program and the rise and fall of the fifteen-year effort to teach the cranes how to fly.



*A typical scene at the ICF, where costumed handlers raise young whooping cranes for eventual release into the wild. Image by Tom Lynn, from the ICF website.*

Allen's discovery of the whooping cranes' breeding grounds changed the dynamics of the conservation effort. Knowledge of the location allowed for greater protection of the site, but also enabled a new practice that would go on to shape the species' future.

Beginning in 1967, researchers began taking eggs from nests in order to build up a captive stock. This was viewed as a necessary measure, as the one remnant wild population could easily be wiped out; an insurance policy was required. The idea was first proposed in 1956 by the director of wildlife in the Saskatchewan Department of Natural Resources, and eventually implemented as a U.S. effort, with the eggs flown from Wood Buffalo National Park to the Patuxent Wildlife Research Center in Maryland. This was considered ostensibly harmless as in most observed cases, the female crane would lay two eggs, with only one chick surviving (this often involves siblicide--nature, as ever, red in tooth and claw.)

Before these attempts were made on the whooping cranes, researchers tested the idea on sandhill cranes, finding that removal of one egg did not impact the other's success. Sandhill cranes were used as a proxy for their endangered relatives, but the two species are not similar enough to always warrant these kinds of assumptions. In this case the comparison was apt, and the whooping cranes reacted the same way the sandhills had, that is they did not. When it came to actually raising the chicks, they proved much more difficult to keep alive.

By 1974, a total of fifty eggs had been taken. Thirty-seven had hatched, with twenty-three chicks living past six months. By 1974, nineteen remained at the facility. The high mortality rate of these early years is indicative of the experimental nature of the work.

Researchers were learning as they went, and as a result many chicks died of preventable causes

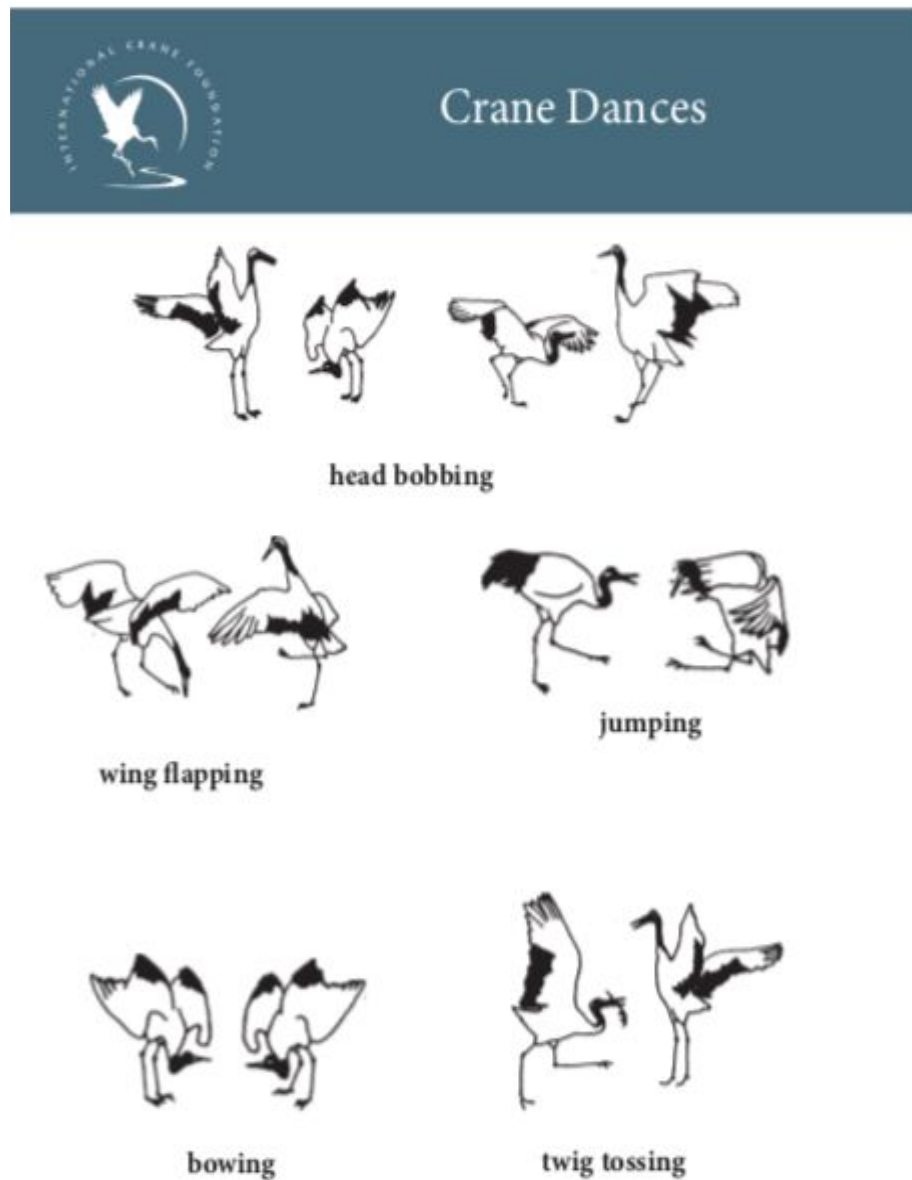
such as insufficient exercise. Malnourishment resulted in deformities of the legs in many young cranes. Strategies that worked on newly hatched sandhills were inapplicable to whooping crane chicks. (Doughty 1989, 84-87) During the 1960s a steady diet of grain was considered appropriate for these creatures which are primarily carnivores in the wild. At the Aransas Refuge, cranes were provided ample grain, by airplane, when authorities feared marine organisms were in short supply. They also planted crops specifically for the cranes, which did not prove successful. (Doughty 1989, 34) Mortality remained high, with many preventable deaths attributed to pen injuries, rearing infections, even deadly attacks by hostile birds housed in close quarters. This is just to say that this was a period of learning and of trial-and-error, but nevertheless by the late 1970s the captive group was reproducing.

As previously noted, permanently captive whooping cranes have their wings pinioned, the removal of the outermost pinion joint of the wing, or even tenotomized, a surgical alteration to one wing that prevents the bird from fully extending it. This has been a hindrance to captive breeding efforts. Successful copulation involves a great deal of flapping, as well as the male's ability to mount and balance on the female, no easy task with a surgically imbalanced wing.

Cranes are defined by their dancing, and the behavior is considered one of the reasons for the near-ubiquitous historical affinity for the genus. There is archaeological evidence that people during the Neolithic era in Turkey used common crane (*Grus grus*) wings as costumes for ritual purposes, and it is theorized that this practice of people mimicking crane dances played out across the world. (Russel and McGowan 2002)

Several hand drawn crane dances are shown below, but nothing can quite capture the real thing like seeing it for yourself. If you are unfamiliar with the whooping crane's dance, may I

suggest you pause reading and watch a video; there are many short clips available online, and linked in the reference list.



*A diagram showing various dances of the whooping crane. Unlike some other bird species, cranes do not only dance as part of pair bonding or mating ritual, but engage in the activity year-round, as well as in family groups. Image courtesy of the International Crane Foundation*



Beyond the physical restrictions and the stress of penned-in life and artificial insemination, the captive-breeding of these cranes is a hindrance to their emotional and social life. The individuals who do not have a future in the wild are acclimated to humans which is considered to keep them more comfortable than attempts at fostering quasi-wildness in perpetual captivity. The other group is different, those birds intended for release into the wild cannot be overly accustomed to people at the risk of causing future damage to themselves or others. Essentially, this effort represents an attempt to manufacture wildness, to create it in a test tube, by taking advantage of the cranes' inclination to imprint on anything or anyone.

Captive breeding facilities including the ICF and Patuxent did not use a parent-rearing approach. The evidence was clear, captive whooping cranes make for unreliable, and at times homicidal, parents. Beyond even this, and the main reason that attempts were not made to coax the adult cranes to become better parents, was that biologists and animal husbandry experts could produce the cranes much more efficiently. As previously mentioned, researchers removed the "extra" egg from two-egg clutches in order to build up the captive population. In time, it became clear that the female would try and complete her clutch by laying additional eggs to make up for the missing ones. By manipulating the laying process, biologists were able to "maximize the output of any breeding female" and get up to eight eggs from one individual. (van Dooren 2014, 93-4) Whereas one, maybe two chicks could be produced on an annual basis in the wild, here that was magnified.

The calculated nature of this work, where the creature is reduced to her material productivity, is indicative of a mechanistic view of the species that, frankly, is more than a little disturbing to me. While this approach did enable the program to stop taking eggs from the wild

birds, it also had some major shortcomings. Hijacking the bird's system in this way to produce as many eggs possible meant that after the first few, the eggs deteriorated in quality--smaller, lighter, with a lower hatchability rate. These "sacrificial" (van Dooren 2014) individuals live in captivity so that their offspring can fly forth and be free, the species' health trumps individual welfare, a necessary trade-off. Despite these borderline unethical practices, the program nonetheless represented the best hope for the species on two major fronts: strengthening genetic diversity through strategic pairings (ICF, 2011, 1:51) and opening up the possibility of reintroducing the cranes to areas of the country they had been absent from for a century.

With their biological parents out of the question, whooping cranes were initially placed with surrogate sandhills in the hope that they would learn to be wild. This effort lasted fifteen years, resulted in many deeply confused birds, and produced only one chick, a sandhill-whooping crane hybrid nicknamed "Whoopsie." (Mooallem 2013, 223) With nature's possibilities seemingly exhausted, researchers conceived of creative solutions to the issue at hand, going about hand-raising the chicks without them imprinting on their handlers. The situation called for silence, even around unhatched eggs, and costumes, as shown on the following page.

Costume-rearing is a mainstay of whooping crane conservation, and has proven effective in avoiding unwanted imprinting. The chicks follow the costumed handler on walks each day, and are fed by a hand puppet that resembles an adult crane. The benefit of the costumes (which might be slightly oversold in the below image) is an ability to closely interact with the young cranes while, if not totally mimicking the appearance of an adult crane, limiting human exposure.

Human avoidance is achievable, however there is an insurmountable gap between what a costumed human can provide and the benefits of learning from a crane parent. (Sadowski 2018)

# Dress for Success

**“Hey Mom!”** Whooping Crane chicks bond with the first big object they see after they hatch. This is how we dress to make sure our captive-reared chicks know they are Whooping Cranes when they are released into the wild. *Remember...no talking!*

Adult Whooping Cranes have a red, white and black pattern on their heads, and so do our hand puppets. This will help the chicks recognize other Whooping Cranes in the wild.

A screened window hides our faces from the chicks. We can see out, but the chicks can't see in!

We cover ourselves from head to toe with a loose white costume so chicks can't see the person inside.

Black “wingtips” are just like the primary feathers of adult Whooping Cranes.

Parent Whooping Cranes make “contact calls” to keep their chicks close by. We play the same calls with an Mp3 player hidden in a secret pocket of the costume.

Sturdy boots are needed for mucking around in marshes.

To become a member visit [savingcranes.org](http://savingcranes.org)

INTERNATIONAL CRANE FOUNDATION

*“Dress for Success” promotional materials show the various functions of the whooping crane costume. Image courtesy of the International Crane Foundation.*

Costume-raising has been relied on because of the many documented instances of poor parenting and outright violence from captive whooping cranes (Doughty 1992, 84-9) and the failures in sandhills-as-surrogates effort, (Johnsgard 2011, 59), as well as for maximum productivity. (van Dooren 2014, 93) In recent years, however, techniques have been developed that allow for parent-rearing in captivity. Beginning in 2013, limited parent-rearing began at Patuxent and the ICF and adults were permitted to care for the young for approximately three months. Comparative analysis between costume- and parent-rearing methods shows those raised by cranes are more active and display more foraging behavior than their counterparts. While there is not presently enough data to determine if that group also displays better parenting behavior once released in the wild, (Sadowski 2018) other evidence suggests a behavioral consistency in this respect. It is unclear at this juncture if parent-rearing presents a viable option, especially considering other changes in the program's operation.



*Puppet feeding a crane chick. Photo by Tom Lynn, published in Audubon Magazine.*

Costume-rearing works to a point, but in order to actually re-wild these birds, additional measures had to be taken. Reintroducing whooping cranes to the eastern US was made possible by a partnership between unlikely allies, united in a vision of teaching young cranes to migrate. Operation Migration is singular among conservation projects for its ambition, idiosyncrasies, and for both a name and premise that would seem to better befit a movie than real life. Perhaps unsurprisingly, the project was not conceived of by biologists, ecologists, conservationists, or indeed anyone with any formal training when it came to birds or their environments. Rather, it was a couple of oddball artists who pioneered this improbable conservation project.

There is an odd cosmic symmetry to humans teaching birds to fly with aircraft that are all essentially modeled off the physical form of flying birds. To quote the Operation Migration website, “We are often asked why we dedicate our time and effort to save Whooping cranes . . . As aviators, we have a love for the creatures that taught us the art of flying. Now that they need our help, how can we refuse?” These ultralight aircrafts, sometimes called trikes, are one of the simplest planes --tiny and open to the air--there is usually room for only the pilot in the nonexistent cockpit. Often used for recreational purposes, the use of these aircrafts in scientific work had a distinctly non-scientific start, with the aforementioned artists. One, a sculpturist named William Lishman, was indirectly compelled to become involved in avian conservation when in 1985, he accidentally happened upon a flock of ducks in his ultralight.

Jon Mooallem writes in *Wild Ones*, his chronicle of assisted migration, “the wild-looking man with a bristly brown beard was suddenly soaring inside a cloud of birds, sharing the air with them. It was as though he’d forged a living sculpture. He craved that closeness again.” (221) So, he researched imprinting and acquired a group of Canada goose goslings that he raised to follow

him and his plane. This was as yet unrelated to conservation, he just wanted to replicate being so exhilaratingly close to the unknown.

Herein lies a common theme, exhilaration. Later, when Operation Migration became a minor cultural phenomenon, widely taught in elementary schools and broadcast on the news, many people who wouldn't otherwise have batted an eye at a flock of migrating cranes became enthralled with the oddity and wonder of the project. A flock of cranes flying with a plane is more exciting, more interesting, to most than the cranes on their own. As nonscientists, Lishman and his colleague Joseph Duff were able to conceive of a grand spectacle of a conservation project that leveraged public interest in a way that most environmental work cannot.

Before attempts were made on whooping cranes, several groups of sandhills served as guinea pigs in this endeavor to simultaneously teach cranes to learn a migration route from an aircraft and condition them to live unsupported in the wild. The first year this was attempted was in 1997, and results were mixed. On the one hand, the cranes did learn the migration route and were able to repeat the trip on their own, showing that the theory was solid. However, the cranes were also over socialized to humans, and as a report on this study states, they “became too tame and often landed in schoolyards . . . this behavior may be the result of similarities between the schoolyards and the chain-link fences and large areas of cut grass” at Patuxent. (Duff et al 2001, 115) A few years later, another group of released cranes flew into a high security area in an Arizona state prison, showing a persistent affinity for spaces enclosed by fences. (Ellis 2003, 262) This is understandable, the birds are impressionable to a fault, but issues like these get at the deep-rooted problem with this work of attempting to cultivate wildness in captivity.

In the following year, more stringent measures were taken to increase the birds' wild tendencies, as well as a reconfiguration, rather than conditioning the birds to follow partially costumed handlers and then the planes, they would focus on the aircrafts themselves as surrogate parents. To this end, beginning three days before hatching, researchers began playing recordings of aircraft engines to the eggs, then the chicks, conditioning them to the sound as they would the sounds of their parents in the wild. When the chicks were one week old, they would begin interacting with the aircraft, and after another week would be led behind it. When they were about a month and a half old, the group was shipped from Maryland to Canada. The migration went better than the previous attempt, direct human involvement had been reduced to nearly a third of what it had been, and the objective of creating a wilder bird had been met. In this study the wildness criteria were "how closely the cranes could be approached . . . and their propensity for associating with people" after the experiment. (Duff et al 2001, 119) While the birds were not as wary of humans as their wild-born counterparts, none of this cohort were ever spotted in schoolyards or other like facilities.

Other experiments during the 1990s involved sandhill cranes being taught to migrate by following cars or ambulances; some were even driven along the route in the hopes they would pick it up that way. This did not work. There is also the constant issue when it comes to motorized migration, power lines. Normally while migrating, whooping cranes fly for about seven and a half hours, covering about 250 miles. With the right conditions, they can fly even longer, covering close to 500 miles in a single day. (Johnsgard 2011, 52) Wild cranes fly very high in the sky in order to coast on thermal winds, heights that cannot be achieved if the bird is following an ultralight or land vehicle. The low altitude truck migrations resulted in many

collisions and three fatalities, along with an increased threat from golden eagle predation. (Ellis et al 2003, 261)



*Sandhill cranes migrate in formation around an ultralight aircraft in 1996. Image from “Motorized Migrations” (264)*

The Whooping Crane Eastern Partnership (WCEP) formed in 1999, a collaboration between nonprofits, government agencies, and individuals.<sup>1</sup> Their goal was to reintroduce a population of cranes into areas of the eastern US where none had lived in one hundred years. From Wisconsin to Florida, these birds would make up the first class of the Eastern Migratory Population (EMP). Experimental nonmigratory populations in Louisiana and Florida had already

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<sup>1</sup> Founding partners included the US Fish and Wildlife Service, the ICF, Operation Migration, Wisconsin Department of Natural Resources, US Geological Survey, and Patuxent Center. (WCEP, n.d.)



been established, those programs have not been very successful and I have chosen to largely forgo them in this piece.

After the sandhill trials, in 2001, Operation Migration led the first group of seven young whooping cranes in a motorized migration, to quote from Operation Migration's website, "shortly after the 9-11 attack on the United States. It was a time when the nation needed an uplifting story; one of ordinary people working to save an endangered, North American species." The trip took forty-eight days, the fastest trip they ever managed. These motorized migrations involved a caravan of support staff and vehicles- ultralights and RVs and portable camouflage pens for the cranes. As Mooallem writes, "the birds are transferred clandestinely, priceless works of art." (206) Environmental educators traveled with the migration team, teaching lessons about the program and demonstrating the costumes and puppets at elementary schools.

The results were promising, with a few important caveats. To begin with the successes, the cranes that had been led south in the fall for the most part returned to the same northern area, and to the surprise of researchers, most of them followed the most direct route back, rather than copying the more circuitous route necessitated by the motorized migration. (Ellis 2003, 263) But, this was only the survivors. Between 2001 and 2015, 239 cranes were released in Wisconsin with a survival rate of 40%, as of 2015. These birds have a high rate of nest abandonment, attributed to black flies, as well as a high chick mortality, probably due to the unnatural environments of these birds' early lives and their lack of parental role models. (Sadowski 2018 56-7)

In January 2016, the NFWS announced they were withdrawing support for the program, citing the released cranes' low reproductive rate and the high cost of the project, and recommending a shift toward less "artificial" methods. A total of \$20 million had been spent, but

only 93 of the whooping cranes had survived, producing only 10 chicks. (Bergquist 2016) The bold effort in restoration had lasted fifteen years, and had shown it was possible to teach a migration path and have the birds repeat it, but it also showed these captive-raised cranes were woefully unprepared for the outside world with all its predators and power lines, and did not have the skills to raise their young. The ICF spends an estimated \$100,000 for every whooping crane raised and released. (Main 2016) Any reintroduced population would have to be supplemented continually, a prohibitively expensive, ecologically untenable situation.

The failures of this exercise in restoration ecology speaks to some of the issues of transposing this kind of conservation ideal, that is “saving” a species, onto our real, messy, imperfect world. Whooping cranes had begun to withdraw from the eastern US hundreds of years ago, before their numbers were dramatically reduced, the land was filling with people who were draining wetlands and felling forests for farmland. Taking a much longer perspective, it is impossible to ignore that the world this species arose in is long gone. The cranes’ heyday was the Pleistocene, vast stretches of shallow ocean made for abundant habitat. By the 1940s, their numbers had been declining for 60 million years, very slowly, then almost all at once. By all limits of reason, this bird should be extinct. To take a cynical view: conservation of this species is at its best, a hugely costly (in many senses) effort to delay the inevitable, and at its worst an exercise in performative ecological benevolence, ultimately causing needless pain and death. I am not that cynical, and believe there is real value in these efforts. But, part of detangling the threads of this work is reconciling the optimism of conservation with the realism of our fractured, polluted, biologically-jumbled world. van Dooren refers to this effort as “producing hope at the dull edge of extinction” and places it in Anna Tsing’s notion of ‘gardening in the

ruins,’ describing “a practice of care that aims to nourish and sustain species and their living participants in far-from-ideal conditions, where the most desirable options simply are not available.” (2014, 116) This provides a lens with which to examine the very purposes of conservation. Efforts that may superficially appear to be species-centered, when prodded at, often reveal themselves to be more plainly about our own aesthetic, idealistic, or moralistic tendencies.

Whooping cranes become symbolic and the target of so much attention not because of their ecological vitality, but rather because they were the *most* endangered, and tall, beautiful, mysterious, long-lived, and monogamous. Cranes have reminded people of ourselves for the entirety of recorded history, standing at four to five feet tall, with a lifespans of forty years, in possession of complex social lives. (Russell 2002) Is this the root of our outsized effort to save this species, a fear of looking into the mirror of nature and no longer seeing ourselves reflected? This is not easily answerable; and the immediate relevance of these underlying motivations is questionable. However, I do argue that it is useful to contemplate why we practice conservation the way that we do, selectively, with prejudice to the charismatic, the spectacular, and the idiosyncratic.

#### IV.

#### **Is One Crane in the Marsh Worth Two at the Feeder? The Limits of Restoration in an Entangled World**

As of this writing, and not including any chicks hatched in spring of 2020, there are 825 whooping cranes in the world. Of those, 159 live in captivity. Of the remaining 667 birds living in the wild, 163 are members of reintroduced populations: eighty-five in the Eastern migratory population, sixty-nine in the Louisiana non-migratory group, and just nine in the Florida non-migratory group.

In the 1960s and 70s, they were classified as one of the original endangered species and added to the International Union for Conservation of Nature's (IUCN) red list, known as the 'barometer of life,' at its conception in 1964. At that point their status was that of critically endangered, but as their numbers have steadily climbed, they have been downgraded to merely endangered. Whooping cranes are also no longer the world's most imperiled crane, that distinction now belongs to the Siberian crane (*G. leucogeranos*). (Love n.d.) Even with the leaps and bounds made in the species' conservation, whooping cranes continue to face significant threats. Illegal shootings have increased at an alarming rate in recent decades, and habitat loss has continued virtually unabated. Then there are the factors that are more difficult to quantify or predict, such the implications of climate change disruption, and the long-ranging impacts of the released captive-raised birds on the wild population.

In January of 2020 I was able to travel to the Texas Gulf Coast, winter home of the whooping cranes. These birds had been dancing through my head for months and I wanted to see their world for myself in order to understand their glamour, as well as their fragile, tenuous position in the world. I wanted to see the birds, of course, but also get a sense of the people who

travel to see this iconic species. There is an annual Whooping Crane Festival in the area (which unfortunately did not line up with school break) and I'd see images online of the festival's mascot, pictured below, and I was interested in how the already obsessive culture of birding manifested with this bird that seems to elicit the most obsession.



*A scene from the 2016 Whooping Crane Festival, image from ICF website.*

My flight arrived in Corpus Christi late at night. The city has the deepest port on the Gulf of Mexico and is a hub of oil and petrochemical industry. Circling over the city, I was immediately struck by the number of bright lights flashing on and off shore. The region is one of the richest in the country in terms of bird life, and during migration people flock from around the globe. The Central Flyway of North American migration passes right over this region, and the

thought of all those millions of birds navigating this utterly anthropogenic landscape made my stomach churn.

It is estimated that 85% of global wetland habitats have been destroyed. In the US, the Fish and Wildlife Service has not updated their wetland report since the 1980s, at which point 50% of the country's wetlands had been lost, a number which is estimated to have grown slightly, perhaps to 53%. A significant factor in this loss has been the draining of wetlands to open up new agricultural areas. Wetland protection has been prioritized by the federal government since 1989 when a policy of "no net wetland loss" was enacted with the purpose of balancing development and protection, but with so much damage already done it is difficult to evaluate the efficacy of this policy, especially in the light of climate change.

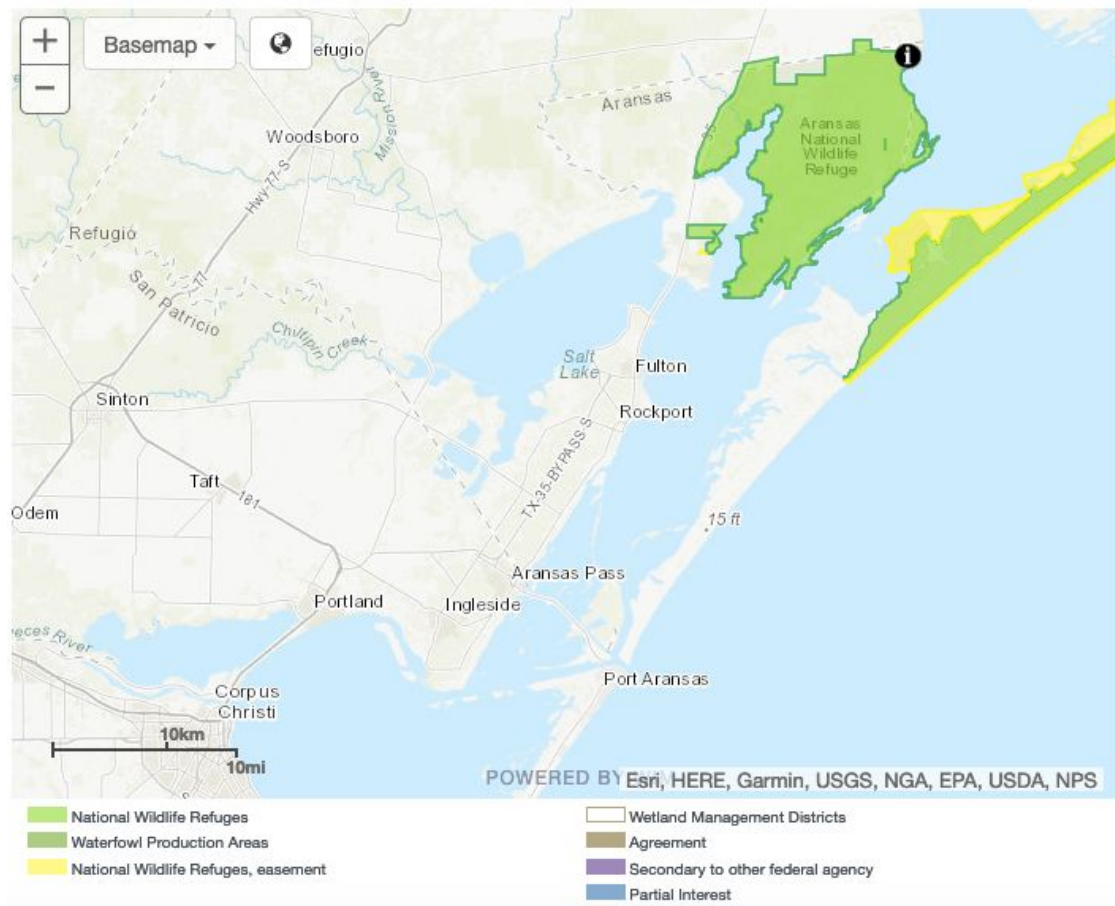
Sea level rise and salt intrusion pose a dire threat to coastal wetlands, a habitat that is only functionally able to support the array of life that calls them home through a balance of salt and freshwater. They are highly dynamic systems, and when the water chemistry changes the entire food web of the marsh is impacted. A drought in the winter of 2008-2009 caused a dip in what had been steady population growth in the Aransas-Wood Buffalo population of whooping cranes, from 270 to 247. During droughts, fresh water sources are redirected to urban centers, further exacerbating the high salinity of the marshes, and causing the cranes' main food source, blue crabs, to decline. Winter mortality has been directly correlated with blue crab availability, when this food source is scarce the birds suffer. They also cannot drink the salty water, the cranes cannot process it past twenty-three parts per thousand. (IUCN 2019, 2-4)

The Aransas National Wildlife Refuge and surrounding state and privately protected lands are the last winter habitats for that remnant population of whooping cranes. Situated along a chain of barrier islands, these scraps of undeveloped land are surrounded on sea and land by highly built up, densely populated areas and massive oil refining operations.

The Fulton-Rockport area was ravaged by Hurricane Harvey in 2017 and has yet to totally recover. Despite the perilous nature of life on a barrier island residents of the area are determined to stay. Condominium and hotel developments were going up all over, just as close to the ocean as those that were leveled by the storm. In some places the debris had not yet been cleared away, leaving a curious image of coinciding development and destruction, as if laying bare a collective, cyclical short-term memory loss. From conversations with a few residents I got the impression that more people in the area were opting for mobile homes, a compromise in living in such a beautiful yet dangerous place. The cranes, so called “the original winter Texans” do not have such options. While the impacts of climate change will continue to prove trying for the people of the Texas gulf coast, these environmental changes could sound the death knell for the whooping cranes, who have no place left to go. The populations have finally reached hopeful numbers, but encroaching sea level rise and an increasingly unstable climate throws the future of this ecosystem into jeopardy.

In recent years, Corpus Christi has expanded its oil industry and grown into the biggest energy exporter in the nation, handling some 122.2 million metric tons of cargo (60% of it

exported oil) in 2019 alone. (Schneider 2020) A ill-timed oil spill, even a minor one, could cause irreparable harm to the ecology of the Aransas salt marshes.



*Aransas National Wildlife Refuge in green, this map shows coastal wetlands and barrier islands.*

To reach the wildlife refuge by car, you drive miles through farmland. In January nothing was growing anywhere, giving the vast stretches of empty land a barren, vaguely post-apocalyptic feel. At the refuge, elevated platforms look out over stretches of salt marsh filled with the long-legged wading birds that were the most sought after for the millinery trade. Great egrets, glossy ibises, white pelicans, roseate spoonbills, little blue herons crowd together,



their splashing and guttural cries swelling in the symphony of the salt marsh. Crowds of sandhill cranes dot the landscape, their grayish bodies blending in with the marsh grasses.

The whooping cranes' pure white bodies stand in stark contrast to their surroundings, and they are often visible even without magnification. Pairs of whooping cranes strut through the grasses, surveying their territory and never straying far from each other, wading through muddy water. The birds walk with their heads cast down, pausing to bend and dig through the mud, snatching up crabs and tearing them limb from limb. While they ignore the other wading birds, when another whooping crane encroaches on their territory the pair beat their wings and fly at the trespasser, sending them fleeing without physical altercation.

In fact, in a paradoxical twist, there may now actually be *too many* whooping cranes in the Aransas-Wood Buffalo population. The restoration of the species has far outpaced the protection and restoration of habitat, resulting in overcrowding. Over the past twenty years, the birds have begun to fly and gather in great flocks unlike anything seen in recent memory. While they do tend to be more gregarious during migration, this constitutes a major behavioral shift for the species. (Caven 2020, 1) Multiple articles appeared in the first week of April 2020 with the same joke as a headline, variations on, "Lack of social distancing threatens whooping cranes." (Mitchell 2020, Goldman 2020)

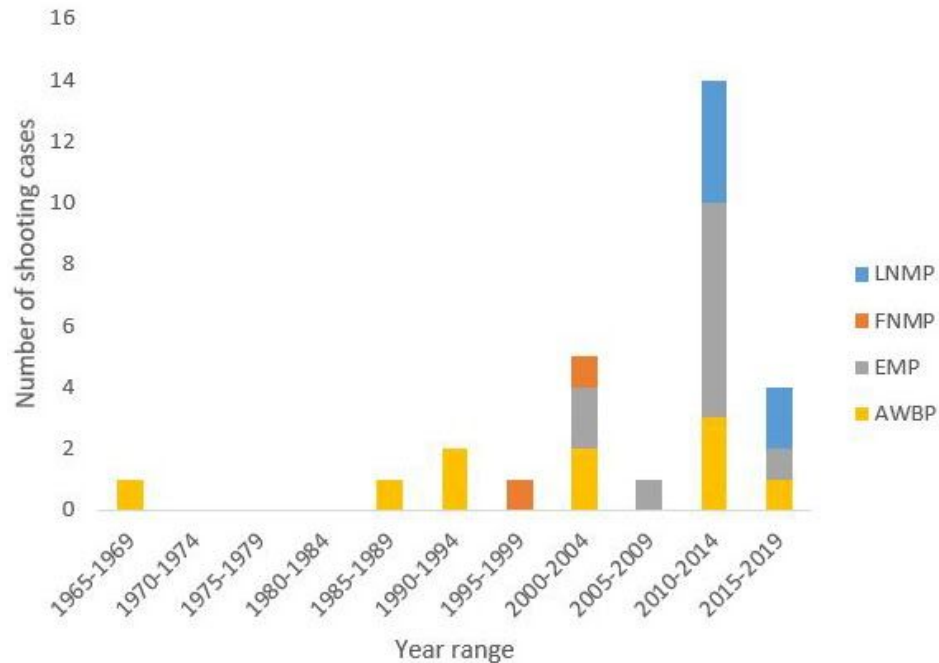
This crowding issue has been observed along the cranes' migration corridor. There are few suitable stopover sites for migrating birds, so many congregate in small zones of protected

land like the Platte River in central Nebraska. The lack of available habitat leads to a bottleneck, with a wide array of migratory birds crowding a small area. In autumn of 2018, a group of 151 whooping cranes was spotted in a field in Saskatchewan, and there has been a well documented increase in flocks over ten individuals at a rate exceeding population growth. (Caven 2020, 11)

This indicates that the shift is not simply a natural result of the increased population, but it can be difficult to evaluate. Most of the scholarship on the species is from a period when the cranes were at critically low wild numbers, and we might now be witnessing behavior that would have been commonplace just a few hundreds years ago. Historical reports of large flocks of whooping cranes have been largely discounted as there was a widespread confusion with sandhills, including by Audubon. (Doughty 1989, 18) In this case it is vital to acknowledge all that is not known, and adjust preconceived notions about what these birds can and should be.

At the same time, these historic numbers may not be sustainable in the few areas of habitat that remain. Congregating in such large groups and close proximity to groups of other waterfowl puts the species at a greater risk of disease outbreak, and a bad storm could be devastating. (Caven 2020) The cranes are unable to extend their range to accommodate the elevated population, thus illustrating a significant issue of hybrid *ex situ* restoration effort, artificial population growth without adequate habitat protection. This leaves the whooping crane with a future as uncertain as ever.

A direct threat is illegal shootings, which has proven especially problematic in introduced populations. Between 1967 and 1999, only five whooping cranes were shot, but between 2011 and 2016, more than 20 birds were shot. (Carey 2016)



*A chart indicating the rise in shootings in recent decades (blue for the Louisiana non-migratory population, orange for the Florida non-migratory group, gray for the Eastern migratory population, and yellow for the Aransas-Wood Buffalo group. Image from Condon 2018.*

Gunfire accounts for one in five deaths among the Eastern Migratory population. (Main 2016) Not necessarily born out of malevolence, some claim ignorance of the species' status, and considering that sandhill hunting is legal (one of a few exceptions to the ban on hunting of migratory birds), I can understand a certain level of confusion. The fines levied for whooping crane hunting range widely, from a \$1 fine for a case in Indiana, to \$85,000 in a South Dakota case. In 2016, a teenager in Texas shot two whooping cranes, originally part of the experimental Louisiana flock, and later admitted to knowing what they were, as well as their endangered status. Initially, the ICF recommended a fine of \$113,886 per bird in order to account for the full cost of raising and release. Director Liz Smith wrote in a letter to the court, "The shooter did not just illegally kill two birds; he stole an intensive monetary investment by federal and state

governments and nonprofit organizations in the United States and Canada, as well as, saddened and outraged the public through this thoughtless and brazen act.” (ICF 2016)

I find the way this is couched very interesting, as a hijacked investment, especially considering that all three reintroduction efforts are experimental by design. In a 2013 case, a South Dakota man who had illegally shot a crane was fined \$85,000 in addition to some jail time, although that case also involved witness threatening, an added complication. (Carey 2016) The teenager was eventually fined \$25,850, to be paid in restitution to the Texas Parks and Wildlife Foundation and the International Crane Foundation, in addition to community service and a suspension of his hunting license. (Main 2016)

In a Louisiana shooting from November of 2019, no suspect has yet been apprehended, but there has been a total of \$11,000 put up as reward money for information about the case, between organizations such as the Louisiana Wildlife and Fisheries Association and the ICF, and private donations. (SNS 2020) All known shootings have been carried out by white men, with an average age of 27.5. The majority of the time these were not hunting incidents, rather more spontaneous or accidental situations. (Condon 2018)

In the wake of these setbacks, officials have recognized that the restoration of whooping cranes into historical territory has not been matched by adequate science communication. (Main 2016) In order to encourage the success of these programs the species’ status has to be widely broadcast, with residents acting as stakeholders rather than mere onlookers. The ICF has increased outreach, connecting to people about these birds’ value, and why they should be left alone. (Condon 2018) Additionally, prosecution of these cases under the Endangered Species Act is contingent on the defendant having known the target was endangered. (Wallington 2019) As

long as the education component of the conservation effort lags, there remains a degree of plausible deniability for people caught shooting them. The increase in shootings have been most evident in the reintroduced populations, which are highly monitored. Shootings of the Aransas-Wood Buffalo group are less likely to be documented due to their large migratory corridor, but may also be less frequent because the species is better known in that area of the country. While the threat posed by hunters is relatively straightforward, there is a much more complex issue with those on the opposite end of the spectrum, those who like to feed birds.

According to a 2007 US Fish and Wildlife study, Americans spend \$3 billion a year on wild bird food, and an additional \$800 million on the related accoutrement, such as feeders, bird houses, and a range of elaborate defenses against squirrels. The backyard bird feeder is ubiquitous across the US, serving as a window into the natural world, even as the landscape has become increasingly urban and suburban. To watch a chickadee peck black sunflower seeds from one's porch is to both feel generally helpful to the natural world and, if ever so slightly, feel oneself return to a primordial state of commonality with the creatures that surround us. I'm overstating it, but there is a certain magnetic pull that captivates so many and causes such lavish spending. With whooping cranes, it gets complicated. In this symbolic species that so many have worked so hard to re-wild, there is something disheartening about them hanging around bird feeders.

In Rockport, Texas in an oceanside neighborhood that ran alongside Goose Island State Park, I saw two different yards sporting enormous feeders, freestanding on three legs and easily seven feet tall. They resembled miniature water towers and each was surrounded by cranes.

The first two whooping cranes I laid eyes on were in one of these backyards. Just past the “Big Tree,” an ancient, towering live oak, and beside a cow field where dozens of sandhill cranes stood, interspersed among the longhorn cattle, I could see the cranes from the road. Someone had dumped a pile of fish heads on the side of the road and a cluster of turkey vultures stood squabbling over them. A male vermilion flycatcher in full brilliant breeding plumage flitted back and forth between fence posts. And there were the whooping cranes, tall white birds at the far end of a field, a pair of adults standing right next to a Texas state flag blowing in the wind.

I couldn’t help feeling triumphant; I had harbored a persistent feeling that I might travel all the way to the Texas gulf coast only to not see any of these birds that have occupied my mind for months. I had already begun constructing a way to work around not seeing any cranes and somehow make the trip about that. Seeing them was much better.

The cranes were milling about, not picking at the grass as the sandhills were but just standing there, looking from side to side, almost like they were waiting for something to happen. Loitering, that might best describe what these birds were doing. This is not to say that this in any way lessened the birds’ beauty, or my delight in finally seeing them, but something felt a little strange. At the house with the gigantic bird feeder there were multiple signs warning trespassers to get lost, and I had a vision of legions of birders armed with their binoculars and foot-long lenses descending on these people’s property like paparazzi.

This pair had deemed this lawn the best place to make their home, established it as their territory and traded in a life of salt marshes and blue crabs for one of a cattle field and as much free grain as they could want. Maybe they split their time and sometimes return to their ancestral slog through the mud, but why would they? Upon repeated visits, they stood in approximately

the same place, doing the same thing. They'd landed on something of a goldmine and had no reason to change their lifestyle, but I wonder if they feel somehow unfulfilled by the lack of crab dismemberment in their lives, or if they're utterly content with the choices they've made. I'm projecting, birds don't think about that sort of thing.

There was one case of backyard whooping crane feeding that perhaps got a bit out of hand. This was not in Texas but Florida, where each whooping crane present in the state is the result of countless hours spent artificially inseminating captive birds, incubating their eggs, raising the chicks, and (until recently) performing the greatest evolutionary hijack of all, actually teaching those birds to migrate.

The project entailed a wholesale reconstruction of a species, an act of conjuring a long-absent presence back into existence through sheer force of will. As compared to more straightforward conservation, that is sustaining or increasing a species in an existing range, species reintroduction is more rare and more difficult. It is simpler to carry on after a species has disappeared and act as if it had never been. That is the general mechanism of our current mass extinction event, a quiet background disappearance of vast swaths of biodiversity. To call attention to specific missing actors and actually work to bring about their return is a far messier task. The futility of work like this is stark, when each individual has to carry the baggage that is the fate of its species and each failure is not a blip on the radar as in a normal system but rather catastrophic.

The issue was that these birds were, again and again, failing to reproduce. This was 2006, and five years of work by the Whooping Crane Eastern Partnership had yielded only one chick hatched outside of a lab. This successful pair and their offspring were known as the First Family-

minor celebrities, this threesome represented the possibility that those years of cultivating wildness in these cranes had actually worked. They epitomized the hope that other pairs would successfully raise young and the population would build from there, eventually becoming self-sustaining. The new family also seemed to symbolize the ways in which wildness could, in certain circumstances, be cultivated, that birds raised in a lab setting could produce a wild offspring. This idea has far-reaching implications for the reconstruction of long-lost species and is a potentially bright spot on the grim map of environmental destruction.

However, these birds had trouble understanding their role as Symbols of the Enduring Power of Wilderness and the Ultimate Redeemability of Man's Crimes Against Nature, and rather than continuing to model idealized whooping crane behavior, migrated south and settled in an elderly couple's backyard where there was abundant seed and little threat of predation. From the birds' perspective this backyard clearly made more sense as a winter home than the salt marshes where the other members of their species toiled for crabs. Just like in the Texas cattlefield, these birds had landed on a jackpot and had every reason to be perfectly content. But the sight of these birds on these lawns, practically domesticated and having forsaken their hardwon wildness was highly distressing to many who had worked--silently and in large robes so to hide their humanity--to raise them in conditions as close to reality as possible. Was all of that effort worth it if the program was only able to graduate birds that would spend their lives as lawn ornaments?

The crazy bird lady trope lent itself well to the media narrative, the woman who defiantly refused the biologists' pleas to take down her feeders. Clarice Gibbs was interviewed by Jon Mooallem in *Wild Ones*, where she shares her side of the story. At the time of the interview



Clarice had recently lost her husband to Alzheimer's. As his condition deteriorated, one of his last sources of joy were the birds that visited their yard. Feeding them allowed them to feel a connection with the larger world around them as those connections became more difficult to form, something Clarice describes as invaluable. Mooallem writes, "Gibbs then said something that might sound obvious, but she said it very slowly, because it was important that I understand: 'If you stop feeding the birds, they stop coming. And you don't get to see them anymore.'" (270) It was far from an intentional sabotage of this conservation work, in fact Clarice was a supporter of Operation Migration's efforts, but there was a fundamental divide in understanding. As I see it, Clarice was entitled to feed the birds as she pleased, as the fact remains that if she had stopped putting out food, there is a good chance the cranes would have picked up and moved to another lawn.

Attempting to enforce the terms of their wildness is as futile a task as any, and represents an unrealistic set of expectations. It is as if the correct thing would be for the cranes to ignore all the modern trappings of life in the only world they've ever known, and instead only consider palatable the small scraps of compromised ancestral habitat. There are real concerns about whooping cranes becoming too habituated to humans, as harm can befall either party. But these worries do not warrant a conservation philosophy based on unrealistic expectations of fabricated boundaries between spaces of nature and culture. The entanglements are real, and must be grappled with, not ignored.

Conservation can be irrational, it can be non-linear, Sysphian, a futile, heartbreaking, convoluted mess. As the threat of climate change forces a cultural reckoning with the legacy of

time in human history, it is of vital importance to value and protect the greatest variety of life. If not, we run the very real risk of bringing about our own species' demise.

This is what conservation work essentially strives for--healing, renewal, a brighter tomorrow. When considered in sum, it is impossible to heal the whole planet. But that is not the task. As Haraway writes in response to the prevalence of this bleak fatalism, "there is a fine line between acknowledging the extent and seriousness of the troubles and succumbing to abstract futurism and its affects of sublime despair and its politics of sublime indifference . . . eschewing futurism, staying with the trouble is both more serious and more lively . . . We become-with each other or not at all." (2016, 3) Through acts of care, of kin-building, and a nuanced approach to the "complex architecture of much of what we call conservation in the twenty-first century," (van Dooren 2013, 116) we can move ahead with increased recognition of our paradigm-shaping biases and the limits to visions of restoration.

In the autumn of 2017, the Patuxent Wildlife Research Center in Maryland halted its whooping crane breeding program after half a century of work. The US Geological Survey declined to renew funding, citing the rebound in numbers in a statement announcing the purposes of the program has been fulfilled. The federal government is now less involved in whooping crane restoration work than it has been in decades, although the strategies pioneered at the facility continue to be used at the ICF and in zoos. The success of restoration efforts can only be determined with time, but has tentatively been deemed so.

## Conclusion

This work does not lend itself easily to tidy conclusions, nor does my approach, which seemed to expand in a spiderweb of ideas, threads intertwined and jetting off in disparate directions rather than forming some complete picture. My inclination to answer questions with more questions has shaped this project; after beginning with a focus on the plume trade and early environmental activism, I gravitated toward cranes as I sought to better understand the boundaries of conservation. I was drawn in by the peculiarities of flying and dancing with birds, and in a certain sense the whooping cranes serve as a case study for larger ideas around conservation.

I still don't know what it means to 'save' a species. Can the whooping crane conservation effort be counted as a success? The population is steadily increasing, but between disappearing habitat and the failures of reintroduced populations, not to mention the recent resurgence in shootings, the situation remains tenuous.

This project has forced me to evaluate my preconceived ideas of this kind of success in conservation, or in environmental work in general, where one step forward can be met with two steps back. At the risk of ending this piece with a false sense of finality, I will not lay claim to any definitive conclusions. Instead, in trying to envision an appropriate place to end, my mind has returned again and again to a Victorian-era trend, not feathered hats, but plants in glass boxes. Let me explain.

In 1829, English doctor and amateur botanist Nathaniel Bagshaw Ward discovered it was possible to create a microenvironment within a hermetically sealed glass apparatus, a perfectly

balanced closed system with its own miniature water cycle that could support (some) plant life indefinitely. A precursor to the modern terrarium, his Wardian cases--in addition to allowing for the movement of live plants around the globe--gave way to a typically Victorian obsession, creating these miniature worlds encased in glass for display in the home. Amidst waste-filled cities choked with smoke, the ability to cultivate a perfect biome inside struck a nerve. More recently, as climate anxiety has grown in young people, houseplants have seen a resurgence. I see these two trends as being born out of the same impulse, to turn away from the outside world, scarred and out of control as it is, and focus instead on cultivating what little life we can.

I bring this up because I think sometimes I forget, and begin to think of real ecosystems as operating like these little models. I envision these fragile natural systems as irrevocably disrupted by humans, swung so wildly off course and out of balance so as to render the future of life on earth an improbable proposition. This kind of fatalism is useless, and thinking in terms of balance, fragility, and disruption is unproductive. Rather, these systems in action are better defined by their dynamism and resilience. It is a far more helpful approach to set aside binary-laded notions of humanity impacting natural systems, and look instead to see one system, endlessly complicated, containing elements both functional and broken.

How can conservation operate in this strange, terrible, beautiful, shambolic world of ours? I see it as an exercise in exerting care and control alongside a recognition of the absurdities of engineering and constructing wildness. The early conservation strategies of blame and shame that worked (to a point) in dissuaging women from wearing feathered hats are insufficient when considering the complexities, as well as the degree of shared culpability, in anthropogenic climate change and biodiversity loss. In many ways, nineteenth century notions of purity and

dominion over the landscape created the conditions for sweeping wildlife protection in the form of National Parks and wildlife refuges. The outdated underpinnings of modern conservation philosophy and our aesthetic value systems must be continuously contested as the field adapts to be more effective and nuanced in grappling with the thorny question of how to best practice care and minimize harm on our shared, deeply entangled planet.

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