

GOOSE MUSIC: VARIATIONS ON A THEME BY ALDO LEOPOLD

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I thank all of you, and especially the symposium organizers, for inviting me to be with you today. Much of my time in recent years has been devoted to cranes and crane conservation, so as a member of the “Crane Clan,” I thank all the members of the “Goose Clan” for allowing me to join you! I hasten to say that I am not a goose expert. Most of what I know about *Branta canadensis* (Canada geese), I have absorbed through osmosis, by hanging out with goose experts in goose places. I have appreciated the opportunity to catch up with the goose world while preparing for this occasion.

I thank you especially for the perfect timing and location of this symposium. I would note, first, the important anniversary that we have just recognized. Some people here, I imagine, were at Pelican Island in Florida last week to celebrate the 100th anniversary of the U.S. National Wildlife Refuge System. International tensions have overshadowed the event, but it was 100 years ago that Theodore Roosevelt designated Pelican Island as the nation’s first federal wildlife refuge. Such moments remind us that we stand, always, on the shoulders of those who came before us: Roosevelt, Paul Kruegel, “Ding” Darling, J. Clark Salyer, Ira Gabrielson, and so many others, both celebrated and obscure. These people built the refuge system that we all benefit from today. And of course we all recognize the system’s logo: the “blue goose.” So, congratulations and thank you to all our friends in the U.S. Fish and Wildlife Service on this anniversary. May the century ahead be as fruitful as the one behind us.

You have also come to Madison at the high point in this year’s migration. It has been really quite astounding here over the last few days. All the flocks had been bottled up in Indiana and Illinois. Then the weather warmed, the winds switched, the gates opened up, and geese and ducks and cranes and blackbirds, and everything else it seems, have been pouring north in great waves.

Finally, if you look out the windows of the convention center here, you’ll see that we are in mid-thaw; Lake Monona is half-open. The thaw provides me with the perfect opportunity to cite several appropriate passages from Aldo Leopold’s works. They come, not surprisingly, from the essay “The Geese Return” in *A Sand*

County Almanac (Leopold 1949). That essay begins with Leopold’s evocative sentence: “*One swallow does not make a summer, but one skein of geese cleaving the murk of a March thaw, is the spring*” (Leopold 1949:18). For so many of us in Wisconsin or, I suspect, most any place that welcomes geese north in the spring, that line captures precisely that moment when one sees or hears the first migrating geese after a long winter.

The ending of “The Geese Return” is among my favorite passages in all of Leopold’s writing. It seems especially fitting this day. I am both pleased and saddened to say that. Leopold writes: “*It is an irony of history that the great powers should have discovered the unity of nations at Cairo in 1943. The geese of the world have had that notion for a longer time, and each March they stake their lives on its essential truth*” (Leopold 1949:22-23). Until now, I had never tried to identify the historical episode to which Leopold referred. What happened in Cairo in 1943 to demonstrate “the unity of nations”? In fact, it was in November 1943 that Winston Churchill, Chang Kai-shek, and Franklin Roosevelt gathered in Cairo to discuss the course of the war and confer on plans for the future of East Asia and Europe.

A careful reader of Aldo Leopold’s writing from these years will notice that it was often tinged by such awareness of world events. In “The Geese Return,” he seized upon geese as a symbol of the essential unity of the nations of the earth, over and above the human political conflicts that so often divide them. As a wildlife ecologist, Leopold obviously appreciated those natural connections. In the closing passages of the essay, he painted a verbal picture of the unified world that migrating geese surveyed: “*In the beginning there was only the unity of the Ice Sheet. Then followed the unity of the March thaw, and the northward begira of the international geese. Every March since the Pleistocene, the geese have honked unity from China Sea to Siberian Steppe, from Euphrates to Volga, from Nine to Murmansk, from Lincolnshire to Spitsbergen. Every March since the Pleistocene, the geese have honked unity from Currituck to Labrador, Matamuskeet to Ungava, Horseshoe Lake to Hudson’s Bay,*

Avery Island to Baffin Land, Panhandle to MacKenzie, Sacramento to Yukon.

By this international commerce of geese, the waste corn of Illinois is carried through the clouds of the Arctic tundras, there to combine with the waste sunlight of a nightless June to grow goslings for all the lands between. And in this annual barter of food for light, and winter warmth for summer solitude, the whole continent receives as net profit a wild poem dropped from murky skies upon the muds of March” (Leopold 1949:23).

I have always found great calm in these lines. Leopold’s use of the word “muds” must certainly rank among the most poetic uses of the word in literature! Perhaps that is what inspiration is all about: using context to find the glory in the mundane. The connectivity across the landscape that Leopold focuses on is something that all of us who work to conserve migrating creatures think about simply as a matter of course. Conservationists throughout history have had to deal with the disparity between the natural reality of wildlife distribution and movement, and the human reality of political boundaries (Knight and Landres 1998). Standing as we do now, apparently on the brink of international conflict, we see again the tragic incongruity of those realities.

From this somber starting point, we can explore the many ways in which geese passed through Aldo Leopold’s life. Such connections are displayed wonderfully in the original 1949 cover of *A Sand County Almanac* (Leopold 1949), which featured Charles Schwartz’s drawing of 3 Canada geese. Geese have thus been intimately connected to our image of Leopold, and to our reading of this book that has shaped conservation so powerfully for more than half a century. With that image in mind, we can wander through Leopold’s life with an ear cocked for the sound of geese.

There are many entry points for exploring Leopold’s life and work. Waterfowl, and geese in particular, offer an especially apt one. We start where Leopold started. He was born at the mid-point of the Mississippi Flyway, in Burlington, Iowa, in 1887. The closing decades of the 1800s were, of course, a time of rank resource exploitation across the continent. Recall the unprecedented losses of the late 1800s: the passenger pigeons of the eastern United States, the white pine of the upper Great Lakes, the bison herds of the high plains. And, these were years of decimation as well for the continent’s waterfowl populations as market hunters took their toll. Years later, in his essay “Good Oak,” Leopold used historic records to make note of the era’s destruction: market hunters taking 6,000 ducks in 1 season near Chicago; 2 brothers shooting 210 blue-winged teal in 1 day (Leopold 1949:14-15). In short, Aldo Leopold was born in a time and place of ruined resources.

Aldo Leopold gained his early love of waterfowl, waterfowl hunting, and bird-watching in the floodplain of the Mississippi River near Burlington (Meine 1988). Many of his most significant boyhood experiences occurred on the Illinois side of the river, at the Crystal Lake Hunt Club, where he hunted as a boy with his father and first became entranced with waterfowl. That relationship with waterfowl endured across his entire life; one could easily write a book on this subject alone. The best I can do today is focus on a few notable episodes.

Aldo was the oldest son in a family of 4 children. His father, Carl Leopold, was an enthusiastic hunter and a dedicated conservationist. Aldo would later dedicate his book *Game Management* to his father as “*a pioneer in sportsmanship*” (Leopold 1933:v). That phrase, as I read it, contains a subtle paradox, one that embodied the change in attitude that was occurring with the rise of the conservation movement. Carl Leopold was a pioneer in recognizing and demonstrating the ethical dimensions of the field sports, and Aldo as a young hunter absorbed that understanding in the Mississippi River sloughs while watching the skies for waterfowl.

Leopold came of age during the height of the Progressive Era conservation movement. Aldo was 13 years old when Theodore Roosevelt became president; he was 21 when Roosevelt left the presidency. Leopold’s formative years thus coincided with the emergence of conservation in the United States under the leadership of Roosevelt, Gifford Pinchot, John Muir, and others. Leopold absorbed the Progressive Era commitment to conserving populations of wildlife—although one would have not used that word, but rather “game”—for the public as a whole. That progressive commitment carried Leopold down his educational path to an eastern prep school (the Lawrenceville School in New Jersey), to Yale, and finally to the Yale Forest School, where he became a member of America’s first generation of trained foresters and conservation scientists.

Leopold took his first job in 1909 in the newly established Apache National Forest in what was then the Arizona Territory. For those in this new generation of Forest Service rangers, game and wildlife conservation was really a sideline, if in fact they had any interest in it at all. Aldo Leopold did have such an interest. Even in his earliest work as an agency professional, he was pursuing his own game conservation activities—with little supervision except his own.

In 1911 Leopold moved over to the Carson National Forest in the northern part of the New Mexico Territory. From a waterfowl standpoint, this is significant in that it brought Leopold into the Rio Grande basin, where he would spend the next 15 years of his life. Being situated on the Rio Grande would have a critical impact on Leopold’s efforts to understand and conserve waterfowl populations. He soon became

active in the public policy arena as an advocate for reform of game laws, protection of game populations, and establishment of game refuges. This was Leopold's own point of entry into the game conservation movement. In "Forestry and Game Conservation" (Leopold 1918) one of his earliest publications, he surmised that *"the American people have already answered, in a vigorous affirmative, the question of whether our game shall be conserved. Game conservation is ready to enter its second stage, and even the layman is beginning to ask how it shall be accomplished The time has come for science to take the floor, prepared to cope with the situation"* (Leopold 1918:406). And so, even while Leopold was busy attending to his proper forester's responsibilities, he sought to give game management a higher profile within the Forest Service.

Leopold also had waterfowl on the mind during his leisure time. During these years Leopold began compiling the field journals that he would maintain until the end of his life. His journals offer a thorough record not just of Aldo Leopold and his outdoor experiences, but of the landscapes in which he worked. Many of the entries from his years in the Southwest involve waterfowl hunting along the Rio Grande with his friends and growing family. He hunted often during these years, and his favorite haunts were along the Rio Grande just south of Albuquerque. His 2 oldest children, Starker and Luna, often joined him, receiving their first hunting lessons, like their father before them, along one of the continent's great rivers.

One of the products of these Rio Grande adventures was in fact the essay "Goose Music." It was the first essay written of those that would later appear in *A Sand County Almanac* (it was not included in the original 1949 edition, but was added to the later paperback). Leopold wrote "Goose Music" around 1924 or 1925. It reflects Aldo's Rio Grande outings with his family: *"To conclude: I have congenital hunting fever and three sons. As little tots, they spent their time playing with my decoys and scouring vacant lots with wooden guns. I hope to leave them good health, an education, and possibly even a competence. But what are they going to do with these things if there be no more deer in the hills, and no more quail in the coverts? No more snipe whistling in the meadow, no more piping of widgeons and chattering of teal as darkness covers the marshes; no more whistling of swift wings when the morning star pales in the east? And when the dawn-wind stirs through the ancient cottonwoods, and the gray light steals down from the hills over the old river sliding softly past its wide brown sandbars—what if there be no more goose music?"* (Leopold 1953:173).

It is a powerful passage, and points to the importance of the Leopold family relationships as well—

though it must be said that Aldo's early bias as a hunter toward his sons falls awkwardly on our ears today; eventually, his daughters Nina and Estella hunted with their father as well (and Nina would grow up to study geese in southern Illinois). Interestingly, only in preparing for this talk did it dawn on me that Leopold was describing his experience along the middle Rio Grande, and was likely referring not to Canada geese, but to snow geese (*Chen caerulescens*)!

In addition to game protection, Leopold focused during his early Forest Service years on several other professional interests: timber management, watershed protection and restoration, recreation, wilderness protection, and even what we would now call landscape ecology, as he sought to understand the dynamics of entire landscapes. He moved to Madison in 1924 to take an appointment with the Forest Service's Forest Products Laboratory. But even as he went to work at what for him was a rather mundane desk job, he was laying the foundation for the new field of game management in his "spare time."

Leopold left the Forest Service in 1928. Over the next 3 years he would undertake his landmark "Game Survey of the North Central States" (Leopold 1931). The final report of the survey contained an entire chapter on waterfowl. He did not much mention Canada geese (or other species) specifically in that report, but rather sought to paint the big picture of the status of waterfowl populations and habitats. It should be noted that, in the late 1920s, the mid-continent's waterfowl were again in a period of crisis. Populations were down, vast acreages of wetlands were being drained, and neither the conservation groups, nor the government agencies, nor the general public were prepared to take effective action.

In his Game Survey report, Leopold summarized the situation and described 10 "salient trends" affecting waterfowl (Leopold 1931:200). This section of Leopold's report merits an entire presentation, but I will touch on just a few of Leopold's points. In what has to be one of the earliest uses of the term "restoration" in an ecological context, Leopold identified the rising interest in the restoration of drained marshes. He cited Horicon Marsh in Wisconsin (which was just then being reflooded), several lakes in Minnesota, and the Kankakee Marshes in western Indiana as indicators of this important new trend in conservation. The public, he noted, was beginning to recognize that wetland drainage *"is not always desirable, even from an economic standpoint"* (Leopold 1931:201). He referred to the lack of effective enforcement of migratory game laws and the impact on waterfowl populations. He noted *"the absence of comprehensive surveys and plans for waterfowl conservation programs"* (Leopold 1931:202). In short, waterfowl conservation at this point in history was starting from scratch. The field of game manage-

ment still did not exist; the best Leopold could do was summarize the contemporary state of understanding.

Leopold did so, in “American Game Policy” (Leopold 1930), the policy statement that he took the lead in formulating during these years. This statement became the foundation for wildlife management activities in the decades that followed. “Migratory game” was one of the 4 main categories of wildlife discussed in that document. In essence, the policy redirected American wildlife conservation by advocating a new philosophy based on habitat protection, management, and restoration: “*The set of ideas which served to string out the remnants of the virgin game supply, to which many of us feel an intense personal loyalty, seem to have reached the limit of their effectiveness. Something new must be done*” (Leopold 1930:281).

That “something new” would come to be crystallized in Leopold’s 1933 textbook, *Game Management*. A scan of *Game Management* provides rich insights into the early approach to waterfowl science and management. Thus, for example: “*Counting the invisible hosts of migratory waterfowl over a whole continent by means of such an ingenious device as Lincoln’s banding ratio is a feat which has excited either incredulity or admiration, depending on the mental capacity of the onlooker. . . . Continuous census is the yardstick of success or failure in conservation*” (Leopold 1933:169-170). Rusch et al. (1995) would note decades later that the winter surveys of Canada goose populations that began in 1936-37 “*represent probably the oldest continuous index of migratory birds in North America.*”

Game Management appeared just as the dark clouds of the Dust Bowl began to blow across the continent—another crisis for waterfowl populations and habitats throughout the prairie pothole region of the dry prairies and high plains. At this point, Leopold was very active nationally in restoration projects and in the effort to add important waterfowl areas to the national wildlife refuge system (including Wisconsin’s own Necedah National Wildlife Refuge and others in the upper Midwest). In 1933, Leopold joined the University of Wisconsin, where he would spend the remainder of his career teaching, guiding research, and training a new generation—a revolutionary generation, really—of young wildlife managers. Many of them—Art Hawkins, Harold Hanson, H. Albert Hochbaum, to name a few—would become leaders in the study, management, and conservation of waterfowl.

By the latter 1930s, Aldo Leopold was leading his colleagues in wildlife management in still new directions, encouraging them to look beyond game species to consider the broader spectrum of what we would now call biodiversity, with special attention to rare and threatened species. In 1936, for example, he published his first article devoted specifically to the topic

of threatened species (Leopold 1936). I mention this because it reflects another fascinating aspect of the way we think about Canada geese and the changes in wildlife science and management that have occurred since Leopold’s day.

Branta canadensis, as you all know, is distinguished by its diversity. Rusch et al. (1995) noted that “*Canada geese are . . . the most widely distributed and phenotypically . . . variable species of birds in North America The future of these diverse stocks of Canada geese depends on information adequate to permit simultaneous protection of rare forms*” The Canada goose is obviously an important game species, but because of its remarkable degree of intra-specific diversity, it stands as an interesting link in the development of wildlife management and conservation biology. The concerns that we now frame in terms of biodiversity conservation—maintenance of genetic diversity, species diversity, and the diversity of communities within larger landscapes—did not fully emerge until the 1980s, when the term “biodiversity” came into use. But one can identify important precedents, and the Canada goose is an illuminating example. If there is an enterprising graduate student out there looking for a worthy research topic, this is your chance: propose a thesis examining the interaction between the basic science of *Branta canadensis*—its evolutionary biology, phylogenetics, biogeography, ecology—and the management of the Canada goose as an important game species. Such a thesis would help us to understand the challenge of managing an unusually diverse species, one that contains superabundant populations and subspecies as well as rare and endangered subspecies.

But to pick up again our narrative thread In the late 1930s, Aldo Leopold returned to Canada geese as a literary object. An early version of the essay “The Geese Return” appeared in April 1940 in the *Wisconsin Agriculturist and Farmer* (Leopold 1940). Leopold was keenly devoted to communicating with the state’s farmers on wildlife conservation issues, and this article was 1 of dozens that he produced with that audience in mind during the late 1930s and 1940s (Leopold 1999). These essays, in turn, formed the foundation for the collection that eventually came together as *A Sand County Almanac* (Leopold 1949). It was during these same years that Leopold was working closely with Albert Hochbaum in establishing the Delta Waterfowl Research Station, a project that kept waterfowl management at the forefront of Leopold’s thinking.

Not long before completing “The Geese Return,” Leopold prepared the introduction for another landmark publication in the development of waterfowl biology and management, Francis H. Kortright’s *The Ducks, Geese, and Swans of North America* (Kortright 1943). Kortright’s book is truly required reading for anyone interested in waterfowl! Two generations of waterfowl

research have improved upon much of the science, perhaps, but the tone and style of the book is irresistible. In his introduction, Leopold pointed out the value of breaking down the boundary between the sportsman and the biologist: “I particularly endorse Mr. Kortright’s thesis that the sportsman of the future must get his satisfactions by enlarging himself rather than by enlarging his bag Why is this species here? Whence does it come, where does it go? What limits its abundance? What was its role in history? What are its prospects for survival? What peculiarities of habit and habitat comprise its ‘standard of living?’ To always seek but never quite achieve a bag-limit of answers to such questions is the sport of the future” (Kortright 1943:v). The writing is vintage Leopold. These were the questions Aldo had been asking himself since he was a lad along the Mississippi River. The larger point is one he made often in his writing: the need for conservationists of all stripes to combine the sportsman’s passion for wild things with the scientist’s appreciation of the complexity of the natural world.

I cannot resist sampling a bit of Kortright’s prose as well. If Leopold’s writing was marked by its understated restraint and command of the science, Kortright’s was wonderfully over-the-top. This is Kortright on *Branta canadensis*: “Sagacity, wariness, strength and fidelity are characteristics of the Canada Goose which, collectively, are possessed in the same degree by no other bird. The Canada in many respects may serve as a model for man” (Kortright 1943:84). For Kortright, the species was the “grandest of all waterfowl.” The passage is typical. Kortright plainly enjoyed his subject, and Leopold plainly enjoyed Kortright’s enthusiasm.

I do want to add a few thoughts about Aldo Leopold and the problem of superabundant species. He addressed the issue often in his career, in various contexts and in regard to various species—rodents, insect pests, invasive plants, diseases. In the 1940s he faced the issue most directly and personally. The problem of burgeoning white-tailed deer populations in northern Wisconsin precipitated a major deer management crisis in the 1940s. The “deer problem” put Leopold in a very difficult position politically as he advocated keeping the deer herd in check (Flader 1974). He was reviled by certain segments of the public, and the episode taught even the battle-scarred Leopold a few new lessons about the politics, as well as the biology, of wildlife conservation.

His writings on the theme during these years demonstrate that he was well aware of the situation that you will be talking about a great deal during this symposium. In a 1944 article he noted: “Our internal problems were heretofore problems of scarcity. The last decade has now added new problems of excess. Excess deer and elk are eating up many national for-

ests, national parks and other forest and range lands. There is little evidence that the public is learning to foresee and prevent these outbreaks, as distinguished from attempting to cure them. When the time for cure arrives, the damage to the habitat is already completed” (Leopold 1944:28). In another essay drafted around this time, he made the point even more succinctly: “No species is inherently a pest, and any species may become one” (Flader and Callicott 1991: 309). Leopold was thus well aware that management goals and approaches can and should change as circumstances change.

Looking back over the dramatic increase in Canada goose populations that began in the mid-1930s, we should note that Leopold was writing about geese just at the time they began to rebound from their historic lows. In this context of recovering populations, it is fascinating to consider that geese were much on Leopold’s mind at the very end of his life. In fact, Leopold’s last hours were spent watching and counting Canada geese at the family’s “shack” along the Wisconsin River north of Madison. The final entries in Leopold’s field journals include his careful tallies of the numbers of geese. It was springtime—he died on April 21, 1948—and so the geese were returning. Every spring as the geese returned, Leopold counted them. There was nothing that pleased him more than relaxing with his family at the end of the day while counting the geese as they came into the marsh near the shack.

The day before he died Leopold actually counted more geese than he had ever counted on any single day of his life—more than 400. The geese left their mark on him. His daughter Estella tells the story of her father commenting to her at that point that one could not expect to find “any but remnants of wildlife nowadays”—but that the geese along the river were an exception (Meine 1988:518). Even at that relatively low point in the continent’s populations of Canada geese, the migrating populations had apparently recovered to the point where they seemed to Leopold to be remarkably abundant. It helped, too, that the shack was in a prime stopover area!

I will close with a few thoughts about Leopold’s legacy and what it might suggest about certain aspects of Canada goose populations, habitats, and conservation efforts.

I would ask that we consider, first, Leopold’s former haunts along the Rio Grande in New Mexico between Albuquerque and Bosque del Apache National Wildlife Refuge. Those of you who are familiar with that country know that the middle Rio Grande is an ecosystem in serious trouble. Rising human demands for its water and changes in the hydrology of the river basin have reduced the river’s baseflow, disrupted its flooding cycles, degraded its riparian cottonwood gallery forests, and threatened the native fish fauna of the river

itself. The geese of the Bosque remain abundant and picturesque, but they obviously do not exist in isolation, apart from the river that is their lifeblood. They and thousands of other species, upstream and downstream, depend on a healthy river. To maintain them we must think of the river as a dynamic system, of the landscape that the river drains, and of the people within the watershed. This is the essence of ecosystem management—a term of course that Leopold never heard, but which he plainly anticipated (Knight 1996). In short, we cannot talk about the geese of the Rio Grande, or of any other ecosystem, without talking about the health of that ecosystem as a whole.

Another theme that bears mentioning is the simple (and, to most of us, depressing) fact that we are humanizing the environment and changing habitats on a vast scale, at an unprecedented rate. This is not a new thing under the sun; another “Leopoldian” theme is that the ways of life of people and wildlife have been intricately woven throughout history, and both have adapted. The changing status of the Canada goose is but 1 expression of this dynamic. Especially in regard to generalist species such as the Canada goose (and the sandhill crane), we are adapting to wildlife and they are adapting to us. And yet we have to remember that, for many people—especially those living in the cities and suburbs—geese, for all of the problems they can bring, may still be the only wildlife species that many people will interact with on any regular basis. Even in their excess numbers, geese remain a rare and important visitor in the realm of the human.

A third theme to note is one that Leopold knew only in its dawning hours: ecological restoration. Horicon Marsh, perhaps the first example of large-scale wetland restoration, was undertaken less than a human lifetime ago. Restoration is still a relatively new aspect of conservation, dating back to those pioneering efforts of the late 1920s and 1930s. Prompted by waterfowl hunters and conservationists, wetland restoration efforts began even before interest in restoring tall grass prairies emerged, and long before the restoration of other ecosystems was envisioned. We owe a great debt to that generation of leaders, with their sensitivity to the needs of the future. We enjoy today the benefits of their efforts, even as we are challenged by new conservation dilemmas.

I close on the point where I began: Leopold considering the unity of nations in 1943, and noting the gift that geese, and all the world’s migratory species, offer us. They remind us, even—or *especially*—in times of human conflict, of the ties that bind. The geese are returning to Wisconsin in 2003, as they have “*every March since the Pleistocene*,” crossing boundaries and demonstrating, once again, the reality of our global connections. They lift themselves off the water and off the earth. As they pass through our lives, they connect us

to others—other people, other places, other creatures, other times. They unify the world.

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