

Men of the Marshes: Paul L. Errington and H. Albert Hochbaum

*Arnold van der Valk, Professor Emeritus
Ecology, Evolution and Organismic Biology
Iowa State University
Ames, IA 50011
Email: valk@iastate.edu*

ABSTRACT

Paul L. Errington (1902-1962) and H. Albert Hochbaum (1911-1988) were pioneering wildlife biologists whose research focused on muskrats and waterfowl, respectively. Their publications, especially their books, stressed the importance of wetlands as wildlife habitats. Errington spent his entire professional career at Iowa State University. Much of it studying muskrat population dynamics in prairie potholes. His work on the predation of muskrats and other species changed how predators were perceived from negative to positive for ecologists, hunters, and the general public. Hochbaum spent his entire professional career as the scientific director of the Delta Water Research Station in Canada. Because of his influential publications and those of the many graduate students at Delta whose research he watched over, Hochbaum built Delta into one of the premier waterfowl research institutions in the world. Errington's and Hochbaum's books influenced ecologists and the general public, especially those interested in wildlife conservation. They played a significant role in the development of wetland science by demonstrating the importance of wetlands as wildlife habitats and highlighting the urgent need for wetland conservation. Their advocacy contributed to the gradual shift in North American attitudes toward wetlands from negative to positive.

INTRODUCTION

Wildlife biologists, especially waterfowl biologists, have played an important role in developing wetland science and efforts to conserve wetlands. Waterfowl biologists studied organisms of interest to fellow scientists and non-scientists, i.e., waterfowl hunters. Wildlife scientists were the first to recognize the recreational and, thus, the economic importance of wetlands. As early as 1928, Viosca documented the economic value of Louisiana's wetlands because of their annual wildlife and fisheries production (Viosa 1928). Not surprisingly, efforts to conserve wetlands arose initially because of declining waterfowl populations (van der Valk 2018). Scientists interested in waterfowl and muskrats also played a major role in developing wildlife science in the

United States and Canada (Trefethen 1975). Hawkins et al. (1984) provide an invaluable overview of the development of waterfowl biology in the United States and Canada, often written by the original participants. McAtee et al. (1962) is a brief history of the early years of The Wildlife Society.

Two pioneers of wildlife science, Paul L. Errington and H. Albert Hochbaum (Trauger and Kennedy 2012), were also important antecedent wetland scientists. Paul L. Errington studied muskrat population dynamics in wetlands, mostly in Iowa, while H. Albert Hochbaum studied waterfowl ecology, mostly in western Canada. Because they were both talented writers, their non-technical books were widely read by the general public, and this helped promote a wider appreciation of wetlands and increased efforts to conserve them. There have been very few popular books about wetlands. Paul Errington wrote several on muskrats and wetlands, including *A Question of Values* (1987), considered to be one of the few "good" literary biology books (Choinski 1995), and the wildlife classic *Of Men and Marshes* (1957) (Pritchard et al. 2006). Albert Hochbaum's (1973) *To Ride the Wind* describes the Delta Marsh in Manitoba and its waterfowl. *To Ride the Wind* is beautifully illustrated with Hochbaum's distinctive paintings and drawings.

Errington and Hochbaum were associates of Aldo Leopold (1887-1948), who is generally considered the father of wildlife science. (See Meine (1988) for a detailed account of Leopold's life and scientific career.) Although Errington was not one of Leopold's graduate students, he met Leopold while still a graduate student at the University of Wisconsin, and they worked together on a game bird project for several years after Errington left Wisconsin for Iowa State University (Kohler 2011). Hochbaum was one of Leopold's graduate students, and Leopold was responsible for getting him his first and only job as the scientific director of the Delta Waterfowl Research Station in Manitoba, Canada. Like Leopold, Errington and Hochbaum worked to raise the scientific and ethical standards of the new discipline of wildlife science. They sought to put wildlife management on a sound scientific foundation.

Both Errington and Hochbaum's research was curiosity driven. They were outdoorsmen who were keen observers of nature. Robert Kohler (2011) noted an important characteristic of the science of field biologists like Errington and Hochbaum. He called it "residential science." "Residential science is intensive, local, and deeply probing as opposed, say, to survey science, which covers wide areas and generally favors breadth over depth. Survey science travels; "residential" science stays put (Kohler 2011)". Errington spent much of his career working in Iowa marshes, while Hochbaum spent it mostly in the Delta Marsh in Mani-

toba, Canada. This approach to ecological research is now uncommon, but it is so successful that it deserves a second look (Lannoo 2018).

PAUL L. ERRINGTON (1902-1962)

Paul Lester Errington (Figure 1) was born in 1902 in Brookings County, South Dakota. Errington wrote a memoir, *The Red Gods Call* (1973,) about growing up in rural South Dakota and his struggles as a boy to overcome the damage caused by polio to his legs. Because of polio, he could not walk without crutches for a year, and his right leg remained permanently crippled. This misfortune caused him to spend as much time as possible outdoors to improve his walking. Errington always loved the outdoors, especially local wetlands and their animal populations. As a teenager, he began trapping muskrats, minks, and other marsh mammals and even spent some time as a professional trapper. His experiences as a trapper made him aware of the complex interactions of predators (mink primarily) and their muskrat prey: "... I began to see vaguely that there were rules of order behind natural interrelationships. Predation was not a simple matter of a predator having an appetite for a given kind of prey and then going out and killing a victim at will. A given kind of animal did not live just anywhere it pleased. Some things that at first looked simple were turning out to be not simple at all as I learned more about them (Errington 1973)."



Figure 1. Paul L. Errington. (Photo courtesy of the New York Public Library, Life Magazine Digital Archive, Life Magazine, December 22, 1961.)

Errington started at South Dakota State University in 1925 and graduated with a B.S. in 1930. He earned his Ph.D. (1932) from the University of Wisconsin under the geneticist Leon Cole. He was supported at Wisconsin by a three-year fellowship funded jointly by the Sporting Arms and Ammunition Manufacturers Institute and the U.S. Biological Survey. While at Wisconsin, Errington met Aldo Leopold, who was associated with the Sporting Arms

and Ammunition Manufacturers Institute, with whom he formed a close working relationship that continued, especially during the early years of Errington's career. In 1932, Errington was hired by Iowa State University as a Research Assistant Professor in Zoology and as leader of the first Co-operative Wildlife Research Unit in the United States. His early research program was financed by Jay "Ding" Darling (van der Valk 2018) and the Iowa Fish and Game Commission in cooperation with Iowa State University. During his 30 years at Iowa State, he was promoted to a Research Associate Professor (1938) and finally to a Research Professor (1948). Errington wrote more than 200 articles (Carlander and Weller 1964). His research largely dealt with predation and other factors controlling the size of animal populations, primarily wildlife populations (Weller 1963, Schorger 1966, Sivils 2012). In recognition of his contributions to the development of wildlife science, Errington won the prestigious Aldo Leopold Award from The Wildlife Society in 1962. Like Aldo Leopold, Errington worked to improve the professional standards of wildlife biology (Errington 1934), promoted esthetics in wildlife ecology (Errington 1947), and advocated conservation (Errington 1963a). For more information about Errington's life and career, see Weller (1963), Scott (1963), Schorger (1966), Errington (1973), Pritchard et al. (2006), Kohler (2011), and Sivils (2012).

Errington's Ph.D. research was on the effect of predators on bobwhite populations, and he continued to do research along the same lines with quail after leaving Wisconsin. The quail project was initially a joint project with Aldo Leopold, but the two disagreed about how best to conduct it, and Leopold withdrew (Kohler 2011). Nevertheless, Errington and Leopold remained close friends and colleagues, and Errington (1948) wrote Leopold's in memoriam for the *Journal of Wildlife Management*. In 1934 Errington began his muskrat research with studies on the growth and movements of tagged muskrats, as well as observational studies of their territoriality, social interactions, and reproduction (Errington 1961). Predation, especially of minks on muskrats, was a major focus of his muskrat research. Although he conducted research all over the United States and Canada, much of it was done in Iowa. Errington, by his estimate, spent 32,000 hours between 1934 and 1957 in the field studying muskrats (Errington 1961, Sivils 2012). According to Schorger (1966), Errington was as much at home in marshes as were his beloved muskrats.

Errington's research was an amalgam of the natural history tradition that emphasized field observations and a more scientific approach that incorporated theory development and testing. However, as with other contemporary ecologists, he derived his theories from his field observations. Errington's most influential theory resulting from his field observations was his theory of the role of predators in regulating prey populations. He called it the theory of the threshold of security (Errington 1946).

In his field studies, Errington demonstrated that muskrat vulnerability to mink predation depended on muskrat population size above the carrying capacity of the marsh habitat and social pressures within muskrat populations. He also showed that compensatory breeding in muskrats was a frequent response to predation. Before Errington's research, it was universally believed by hunters and wildlife managers that more predators automatically meant fewer prey animals. Errington established that predators preyed successfully only on prey species with an excess population. He argued that the predators would switch to other, more abundant prey species if this were not the case. In other words, surplus prey would not survive for some reason (disease, starvation, conflict); consequently, predation is a "by-product," not the main controller of prey population sizes. His theory was a radical redefinition of predation that resulted in a rethinking of predator control by wildlife managers (Pritchard et al. 2006). According to Carlander and Weller (1964), who were his colleagues at Iowa State, Errington was "particularly anxious to replace the generally accepted public view of predators as vermin by the more realistic view of predators as a part of the natural control of populations."

Besides his numerous research papers, Errington wrote two technical books on muskrats, *Muskrats and Marsh Management* in 1961 and *Muskrat Populations*, published posthumously in 1963. The latter was a summary of his 25 years of work on muskrat populations and a synthesis of all that was known about their biology and ecology. His long-term studies of muskrat populations in Iowa wetlands and the resulting popular publications are his most important contribution to the development of wetland science. Like Leopold, Errington wrote popular books on conservation, the best known of which was *Of Men and Marshes* (1957), which is still in print. (*Of Men and Marshes* was illustrated by H. Albert Hochbaum) (Figure 2). Most of Errington's popular work was published posthumously: *Of Predation and Life* (1969), *The Red Gods Call* (1973), *A Question of Values* (1987), and *Of Wilderness and Wolves* (2015).

OF MEN AND MARSHES

Errington's best-known and popular book was *Of Men and Marshes* (1957). In it, Errington captured the beauty and ecological complexity of prairie pothole marshes. It also was a plea to preserve these endangered wetlands and their unique plants and animals from destruction due to drainage (Pritchard et al. 2006). In *Of Men and Marshes*, he calls on his experiences as a trapper, observer, and researcher to illustrate the wildlife values of wetlands. He describes the flux of organisms in different seasons in prairie marshes using his knowledge of the natural history of birds (ducks, geese, plovers, terns, coots, owls, hawks, limpkins, and blackbirds) and vertebrates (muskrats, beaver, turtles, snakes, frogs, salamanders, mink, fox, coyotes, skunks,

minks, and others). His descriptions of the vegetation and insects added to their vivid depiction. "There is so much life that the marsh seems almost to boil over" (Errington 1957). Errington valued marshes, most of all, for their wildness. "Wilderness and related outdoor values may not offset all of the worries and frustrations to which civilized man is subject, but they help. I would say that cherishing them can be among the experiences redeeming human life from futilities and conceits. The receptive person can thus better see himself, his life, and his problems within a framework of universal order, of permanent physical realities, of evolutionary trends, and of the great phenomena of Life (Errington 1957)." However, he found wildness in the fragmented and small natural areas scattered across the Midwest. Wildness was not something that could only be experienced in large natural areas like The Everglades.

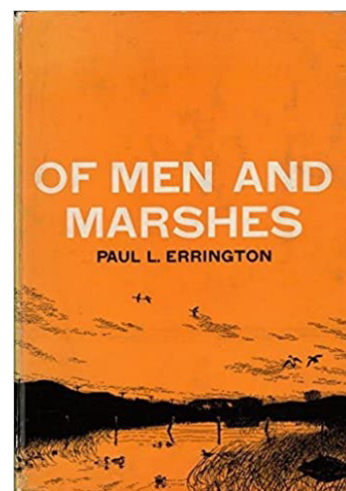


Figure 2. Cover of *Of Men and Marshes* (Errington 1957). Cover illustration by H. Albert Hochbaum.

Errington's *Of Men and Marshes* did for prairie potholes what Marjory Stoneman Douglas' 1947 classic, *River of Grass*, did for the Everglades (van der Valk 2022). Both books demystified wetlands and made them comprehensible and vital to the general public. Both changed wetlands from obscure, useless, and often feared places to important ecosystems that deserved to be valued, even revered. *Of Men and Marshes* was well-received by reviewers in scientific journals and national magazines. The *New Yorker's* reviewer, as quoted by Sivils (2012), noted that Errington "... speaks to us here ... not as a scientist but as a man ... his method is to show us a marsh as his home, to escort us through it in the different seasons of the year, and let us see for ourselves the beauty and wonder that are there. A telling and moving experience." *Life Magazine*, in 1961 in a special issue on *Our Splendid Outdoors*, identified Errington as one of the top ten contemporary naturalists. *Life's* list also included Rachel Carson, Joseph Wood Krutch, Roger Tory Peterson, and H. Albert Hochbaum.

Sivils (2012) eloquently described Errington's numer-

ous achievements: “Trapper, ecologist, and nature writer Paul Errington dedicated his life to the understanding and preservation of wetland environments and to the rich diversity of wildlife that calls them home. Through his technical research and popular writing, Errington challenged us to change how we think about and value marshlands. He was one of the most innovative, forward-thinking, and influential ecologists of his day, and his lifetime of exploring and working in midwestern glacial marshes culminated in his natural history classic, *Of Men and Marshes*.”

H. ALBERT HOCHBAUM (1911-1988)

Hans Albert (Al) Hochbaum (Figure 3) was born in Greeley, Colorado in 1911. He studied art and zoology at Cornell University (B.S. in zoology, 1933). After working for several years for the U.S. National Park Service, he started graduate school at the University of Wisconsin to study with Aldo Leopold. From 1938 to 1970, he was the scientific director of the Delta Waterfowl Research Station in Manitoba, Canada.

The Delta Waterfowl Research Station was established in 1931 (see below) as a duck hatchery in response to declining waterfowl populations. Hochbaum’s initial research at Delta earned him an M.S. degree (1941) in wildlife management from Wisconsin. Besides his studies at Delta, as its scientific director, Hochbaum kept an eye on the field research of graduate students whose projects were carried out at Delta and often funded by the Station. After he retired from Delta in 1970, he devoted himself to writing, painting, and drawing. In recognition of his contributions to waterfowl and wetland conservation, Hochbaum was awarded an honorary doctorate from the University of Manitoba in 1962 and was made a member of the Order of Canada in 1978. In 1980 he was awarded The Wildlife Society’s most prestigious honor, the Aldo Leopold Memorial Award. Houston (1988) and Shushkewich (2012) contain more detailed accounts of Hochbaum’s life and work.



Figure 3. Aldo Leopold (left) and H. Albert Hochbaum. (Courtesy of the Aldo Leopold Foundation and the University of Wisconsin Archives.)

Al Hochbaum was also a talented artist. He had several exhibitions of his paintings, some of which are in the Smithsonian collections in Washington and the National Museum in Ottawa, Canada. In 1970, when Queen Elizabeth II visited Manitoba, she was presented with one of Hochbaum’s paintings. In 1973, Hochbaum published a popular book, *To Ride the Wind*, about the Delta Marsh, lavishly illustrated with his paintings and pen-and-ink drawings of the Delta Marsh’s landscapes and waterfowl. In 1994, another book of his essays and drawings, edited by his son George Hochbaum, was posthumously published as *Wings over the Prairie*. However, most of the illustrations in this book are photographs taken by J. A. Barrie and G. D. Chambers.

THE DELTA WATERFOWL RESEARCH STATION

Al Hochbaum’s life and career were inexorably bound to the Delta Waterfowl Research Station and the Delta Marsh (Figure 4), where he spent his entire professional career. The Station’s founder and patron was James Ford Bell (1878-1961), a wealthy Minnesota businessman who had founded General Mills (Hochbaum 1944, G. Hochbaum 1994, McCormick 2011, Shushkewich 2012). During the 1930s, Bell, an avid duck hunter, had become increasingly concerned about the decline of duck populations. Beginning in the 1920s, he had begun purchasing land in the Delta Marsh in Manitoba, a renowned duck hunting area. Bell’s first attempt to reverse the duck population decline was to establish a duck hatchery on his Delta property. Duck eggs were collected; they were hatched in incubators; the resulting ducklings were reared in pens; and finally, the hatchery ducks were released into the wild. Bell’s goal was to release more ducks than he and his friends shot each hunting season. However, Bell soon realized this approach to increasing duck populations was ineffective. More



Figure 4. Sketch map of the Delta Marsh showing the location of the Delta Waterfowl Research Station. (From Hochbaum 1950a)

detailed information was needed about what controlled the size of duck populations. Was it hunting, habitat loss, drought, predation, or diseases?

Bell contacted Aldo Leopold at the University of Wisconsin to obtain advice on how best to proceed. Leopold spurned Bell's initial overtures because Leopold did not believe in the hatchery propagation of ducks. However, Bell convinced Leopold that his primary interest was in scientific research, not duck propagation. Bell had an undergraduate degree in chemistry from the University of Minnesota and thus recognized the value of a scientific approach to solving problems. The Bell-Leopold discussions resulted in the establishment of a research facility at Delta. Leopold also suggested to Bell that Al Hochbaum, his first graduate student, initiate a research program at Delta on the breeding ecology of ducks. When his M.S. research was completed, Hochbaum insisted it should be published as an illustrated book. The resultant book published in 1944 was the wildlife classic, *The Canvasback on a Prairie Marsh* (Figures 5 and 6). In it, Hochbaum describes "... in chronological sequence, what the Delta Station has learned since 1938 about the principal events of the duck summer: arrival, courtship, nesting, brood-season, flight-less period, "vacation-period," shooting season and departure. In each of these successive periods, the Canvasback is used as a "base datum," and the other nine ducks which breed at Delta are compared with it. (p. xii)" The book's publication made Hochbaum a leading authority on waterfowl behavior and ecology and the Delta Station an important waterfowl research facility. It won the Brewster Medal of the American Ornithologists' Union and the Literary Award of The Wildlife Society.

Nelson (2011) describes the "tumultuous" early history of Delta under Hochbaum's leadership from 1938 to 1950. Most of the crises during this period were caused

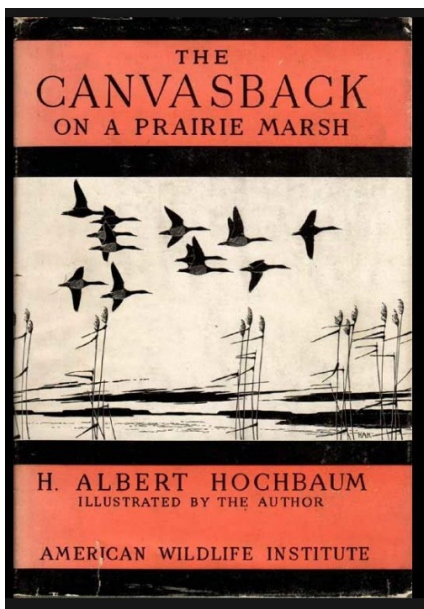


Figure 5. Cover of *Canvasback on a Prairie Marsh* (Hochbaum 1944).



Figure 6. Drawing of river ducks loafing. From *Canvasback on a Prairie Marsh* (Hochbaum 1944).

by uncertainty and inadequate funding. Hochbaum, in the early 1950s, published two short reports describing Delta's mission and research accomplishments (Hochbaum 1950a, 1952). "Delta's goal is "to eliminate guesswork and supplant hit-and-miss thinking with scientific truths." Overall, its research program has "Business-like philosophies, clear-cut and direct, [that] have moved side by side with the scientific approach ... In the business of managing wildlife, facts must overrule guesswork. Such business principles as inventory control, production efficiency, capitalization, and long-term operating policies must be substituted for the wishful thinking of bygone years" (Hochbaum 1950a). These publications outline many studies done at or funded by Delta that range from waterfowl inventories and the physiology of waterfowl to reintroducing ducks in areas where they had gone locally extinct. In subsequent years, Hochbaum and other researchers at Delta would go on to study many aspects of the biology and ecology of ducks, including behavioral studies (homing, re-nesting, and territoriality), the impacts of predation, botulism, and hunting (crippling loss, lead-shot poisoning), and spring and fall migration patterns.

THE PHANTOM WETLANDS CONTROVERSY

Hochbaum was described by those who knew him as stern, mercurial, principled, and uncompromising. Throughout his life, his mantra was that waterfowl management must be based on sound science. In a letter Hochbaum wrote to James Ford Bell, he told Bell that "I have strong personal convictions concerning the conduct of wildlife research and the application of its findings" (as quoted by Nelson 2011). In short, he was a challenging man to get along with.

Hochbaum's convictions often put him at odds with other waterfowl biologists and conservation organizations like Ducks Unlimited. His advocacy of small temporary and seasonal wetlands as important for duck production is of particular significance in the history of wetland science. His stance brought him into conflict with Ducks Unlimited

(DU), which was focusing its resources on protecting and constructing large, permanent-water wetlands. During Hochbaum's career, DU staff was dominated by engineers who believed that by building levees and dams, they could create drought-proof wetlands. Most waterfowl biologists and managers believed these large, deep wetlands to be duck "factories" that produced most of each year's duck crop.

To make matters worse, the concept of "phantom wetlands" was common among waterfowl managers and biologists from the 1940s through the late 1960s (Nelson 2011). Phantom wetlands were small temporary and seasonal wetlands that attracted breeding waterfowl in the spring, but because they dried out during the summer, they were believed to become death traps for ducklings. Ducks Unlimited made a movie promoting the drainage of small wetlands. It showed boy scouts recruited by Ducks Unlimited relocating ducklings from small dried-up wetlands to permanent marshes created by Ducks Unlimited. This movie infuriated Hochbaum. "Ducks Unlimited is a grand idea that has gone 'haywire' on a terrific scale," Hochbaum wrote to Aldo Leopold (Nelson 2011). There were no data to support the phantom wetland theory. In reality, when temporary and seasonal wetlands dry out, the ducks move to nearby larger and deeper wetlands (Evans et al. 1952).

Hochbaum never researched the importance of small wetlands for breeding waterfowl. However, he noticed that most ducks were breeding on small wetlands on his first trip to the Delta Marsh in 1938. "Traveling up from Madison, Wisconsin, I drove all day across the prairies of Minnesota. Here and there along the way were sloughs and potholes (many of them now gone), each holding a few ducks.... As the sight of ducks excited me, I kept saying to myself: 'This is nothing; just wait until I arrive on the Delta Marsh. There'll be vast numbers of waterfowl, huge flocks of them and great clouds more will rise as I round each bend, countless thousands of ducks for me to behold in the heart of their June breeding marsh.' ... My first view of the great marsh was thus a tremendous disappointment. To be sure, there were many birds But the ducks were only in scattered pairs and singles, and occasionally small flocks. Wherever I went, there were ducks, but nowhere many (Hochbaum 1960)."

Hochbaum also paid attention to relevant studies of breeding duck habitats (Hochbaum 1950b, 1960; Evans et al. 1952). "The breeding-ground surveys of recent years have shown that the nesting populations of many of our important game ducks are spread thinly, even on the large marshlands. Agricultural lands may hold breeding numbers that, in pairs per square mile, closely approach or even exceed the breeding populations of the large, so-called "factory" marshes. Such agricultural breeding terrain covers a vastly greater area than the large, isolated marshlands But the ultimate and the successful plan for waterfowl management cannot be established until we win administra-

tive security for small waters on private lands" (Hochbaum 1950b). As noted, Hochbaum criticized the mistaken policies and practices of waterfowl conservation organizations like Ducks Unlimited and state/provincial and federal wildlife agencies. In an address to the Saskatchewan Natural History Society (Hochbaum 1960), he discusses the need to preserve small wetlands in the prairies. He cites multiple examples of areas where remaining large wetlands have not prevented the decline of waterfowl populations during droughts or due to the drainage of small wetlands. Hochbaum ends his talk by noting, "It is essential that we learn as much as possible about wetlands, that we exert, based on sound understanding, as much influence as we can toward the protection of the native waterfowl environment."

Hochbaum's most significant contribution to wetland science was his championing small wetlands and the need to conserve them (Nelson 2011). In 1970 when Hochbaum retired, there were still almost no other waterfowl biologists or managers who believed in the value of small wetlands. Although his position was unpopular and controversial, Hochbaum was eventually proven right.

In summary, Hochbaum and, by extension, Delta made many major contributions to the development of waterfowl biology, wildlife management, and wetland science: (1) he improved our knowledge of the life histories and behavior of waterfowl, (2) he published two seminal and influential technical books on waterfowl, *The Canvasback on a Prairie Marsh* (1944) and *Travels and Traditions of Waterfowl* (1955); (3) his studies put wetland and waterfowl management on a sounder scientific foundation; (4) his popular book, *To Ride the Wind* (1973), raised the visibility of prairie wetlands and the need to conserve them; (5) his mentorship and support of graduate students (ca. 80 to 90 while he was scientific director) from more than 30 universities in Canada and the USA made Delta a major center for wetland research in the world. These graduate students became waterfowl and wetland ecology leaders in academia and government agencies in Canada and the United States. Hochbaum's advocacy of the conservation of small wetlands eventually resulted in a major rethinking of wetland conservation, preservation, and restoration policy in the prairie region United States and Canada.

PERSONAL POSTSCRIPT

When I arrived in Ames, Iowa, in the summer of 1973 to take up a position as an assistant professor at Iowa State University, my first teaching assignment was a course on aquatic plants that fall. I knew very little about Iowa wetlands and their vegetation. I worked on sand dune vegetation on the Outer Banks of North Carolina for my Ph.D. To prepare for this course, I began investigating wetlands around Ames. One of these was Goose Lake, a marsh north of Ames. I was impressed by Goose Lake. It was a beauti-

ful marsh with numerous wetland communities, including a spectacular zone dominated by water lilies. I immediately decided that this would be one of the key field sites that my class would study. I went to Goose Lake with my class in mid-September to collect plants. When we reached it, I was crestfallen. All its vegetation was gone. In its place were numerous mounds of decomposing vegetation sticking above the water's surface, i.e., muskrat lodges.

These visits to Goose Lake were my introduction to muskrats and their role in prairie wetlands. My colleagues quickly directed me to the work of Paul Errington on muskrats (Errington 1951, 1963b) and Weller and Spatcher's (1965) study of Goose Lake. I had never heard of him. From reading Errington's papers and books, I learned that I had experienced an "eat-out" at Goose Lake and that these occurred periodically in many prairie and other wetlands. To my surprise, Weller and Spatcher (1965) had described in detail the previous muskrat eat-out of Goose Lake (Figure 7). I wondered how Goose Lake's wetland plant populations could survive this periodic obliteration. I hypothesized that the plants survived muskrat eat-outs as dormant seeds in the marsh substrate. To test this hypothesis, I examined the seed banks of Goose Lake and other Iowa marshes. The results of this seed bank study supported my hypothesis. This seed bank study was the first of many studies on the vegetation dynamics of prairie wetlands.

During the late 1970s and much of the 1980s, I spent my summers working on a research project at the Delta Waterfowl Research Station, Delta, Manitoba, Canada. One of the people I met there was Al Hochbaum. Hochbaum, it was explained to me, had been the scientific director of the Station for many years but was now retired. I had never heard of him. Nor was I familiar with any of his work. It was early in my scientific career, and I was trained as a plant ecologist. Hochbaum still lived in the village of Delta, which was a very small place, and I would see him every once in a while, walking along its main road, its only road. We would nod at each other, and that would be it. It would have been a different story if I had been trained as an animal ecologist, particularly a waterfowl biologist. To waterfowl biologists, Hochbaum was a living legend. I regret never taking this opportunity to discuss his life and career with him.

REFERENCES

Carlander, K.D. and M.W. Weller. 1964. Survey of a life's writing: Paul L. Errington's bibliography. *Iowa State Journal of Science* 38: 447-458.

Choinski, E. 1995. Literary life sciences: A guide to "good" books in biology. *Reference Services Review* 23: 59-62.

Errington, P.L. 1934. Wild life research as a profession. *The Scientific Monthly* 38: 554-560.

Errington, P.L. 1946. Predation and vertebrate populations. *Quarterly Review of Biology* 21: 144-177, 221-245.

Errington, P.L. 1947. Question of values. *The Journal of Wildlife Man-*



Figure 7. The south end of Goose Lake in 1959 (upper) before the muskrat eat-out and in 1962 after it. (From Weller and Spatcher (1965). Courtesy of the Agricultural Experiment Station, Iowa State University, and Parks Library.)

agement 11: 267-272.

Errington, P.L. 1948. In Appreciation of Aldo Leopold. *The Journal of Wildlife Management* 12: 341-350.

Errington, P.L. 1951. Concerning fluctuations in populations of the prolific and widely distributed muskrat. *The American Naturalist* 85: 273-292.

Errington, P.L. 1957. *Of Men and Marshes*. Macmillan, New York, NY. Reprinted by the University of Iowa Press in 2012.

Errington, P.L. 1961. *Muskrats and Marsh Management*. University of Nebraska Press, Lincoln, NE.

Errington, P.L. 1963a. The pricelessness of untampered nature. *The Journal of Wildlife Management* 27: 313-320.

Errington, P.L. 1963b. *Muskrat Populations*. Iowa State University Press, Ames, IA.

Errington, P.L. 1969. *Of Predation and Life*. Iowa State University Press, Ames, IA.

Errington, P.L. 1973. *The Red Gods Call*. Iowa State University Press, Ames, IA.

Errington, P.L. 1987. *A Question of Values*. Iowa State University Press, Ames, IA.

Errington, P.L. 2015. *Of Wilderness and Wolves*. Edited by M. W. Sivils. University of Iowa Press, Iowa City, IA.

Evans, C.D., A.S. Hawkins, and W.H. Marshall. 1952. Movements of Waterfowl Broods in Manitoba. U. S. Fish and Wildlife Service, Washington, DC. Special Scientific Report, No. 16.

Hawkins, A.S., R.C. Hanson, H.K. Nelson, and H.M. Reeves. 1984. *Flyways: Pioneering Waterfowl Management in North America*. U.S. Dept. of the Interior, Fish and Wildlife Service, Washington, DC.

Hochbaum, G. 1994. Forward and Introduction. In H. A. Hochbaum, *Wings over the Prairie*, Tamos Books, Winnipeg, Manitoba. pp. 6-12.

Hochbaum, H.A. 1944. *The Canvasback on a Prairie Marsh*. American Wildlife Institute, Washington, DC.

Hochbaum, H.A. 1950a. The story of Delta Waterfowl Research Station: a review of the purpose, history, objectives and achievements of a

- research project on the prairie provinces of Canada. American Wildlife Foundation, Washington, DC.
- Hochbaum, H.A. 1950b. The importance of small marshes to waterfowl. *The Wilson Bulletin* 62: 230.
- Hochbaum, H.A. 1952. Report from the Delta Station: a report covering activities and achievements of the Delta Waterfowl Research Station in the Prairie Provinces of Canada. North American Wildlife Foundation, Washington, DC.
- Hochbaum, H.A. 1955. *Travels and Traditions of Waterfowl*. University of Minnesota Press, Minneapolis, MN.
- Hochbaum, H.A. 1960. Wetlands and Waterfowl. *Blue Jay* 18: 164-168.
- Hochbaum, H.A. 1973. *To Ride the Wind*. Richard Bonnycastle Books, Toronto, Ontario.
- Hochbaum, H.A. 1994. *Wings over the Prairie*. Tamos Books, Winnipeg, Manitoba.
- Houston, C.S. 1988. In memoriam: Hans Albert Hochbaum. *The Auk* 105: 769-772.
- Kohler, R.E. 2011. Paul Errington, Aldo Leopold, and Wildlife Ecology: Residential Science. *Historical Studies in the Natural Sciences* 41: 216-254.
- Lannoo, M.J. 2018. *This Land Is Your Land: The Story of Field Biology in America*. University of Chicago Press, Chicago, IL.
- McAtee, W.L., T.I. Storer and E.R. Kalmbach. 1962. The Wildlife Society: Its first quarter century. *The Journal of Wildlife Management* 26: 291-306.
- McCormick, T.J. 2011. JFB: Renaissance man James Ford Bell was waterfowl hunting's unsung hero. *Delta Waterfowl Magazine* 7: 53-55.
- Meine, C. 1988. Aldo Leopold: *His Life and Work*. University of Wisconsin Press, Madison, WI.
- Nelson, D. 2011. The tumultuous early years. *Delta Waterfowl Magazine* 7: 56-68.
- Pritchard, J.A., D.M. Debinski, B. Olechnowski, and R. Vannimwegen. 2006. The landscape of Paul Errington's work. *Wildlife Society Bulletin* 34: 1411-1416.
- Schorger, A.W. 1966. In memoriam: Paul Lester Errington. *The Auk* 83: 52-65.
- Scott, T.G. 1963. Obituary: Paul L. Errington, 1902-1962. *The Journal of Wildlife Management* 27: 321-324.
- Shushkewich, V. 2012. More than Birds: *Adventurous Lives of North American Naturalists*. Dundurn, Toronto, Ontario, Canada.
- Sivils, M.W. 2012. Paul L. Errington: His life and work. Introduction to P. L. Errington, Of Men and Marshes, University of Iowa Press, Iowa City, IA. pp. ix-xxix.
- Trauger, D.L. and P.L. Kennedy. 2012. Pioneering Professionals: Sharing a Passion for Wildlife. *The Wildlife Professional* 6:32-37.
- Trefethen, J.B. 1975. *An American Crusade for Wildlife*. Winchester Press and Boone and Crockett Club, New York, NY.
- van der Valk, A.G. 2018. Assisting nature: Ducks, "Ding" and D.U. *Wetland Science and Practice* 35: 60-67.
- van der Valk, A.G. 2022. From wasteland to tourist attraction: The creation of Everglades National Park. *Wetland Science and Practice* 40: 293-301.
- Viosca, P. 1928. Louisiana wet lands and the value of their wildlife and fishery resources. *Ecology* 9:216-229.
- Weller, M.W. 1963. Resolution of respect: Paul L. Errington 1902-1962. *Bulletin of the Ecological Society of America* 44: 55-58.
- Weller, M.W. and C.S. Spatcher. 1965. Role of Habitat in the Distribution and Abundance of Marsh Birds. Agricultural and Home Economics Experiment Station
- Iowa State University, Ames, IA. Special Report No. 43. (<https://dr.lib.ia-state.edu/entities/publication/0ac7bde0-436e-4475-bfe2-2ce56992f404>)