

Assisting Nature: Ducks, “Ding” and DU

Arnold G. van der Valk¹, *Ecology, Evolution and Organismal Biology, Iowa State University, Ames, IA*

ABSTRACT

Jay “Ding” Darling (1876-1962) was a newspaper editorial cartoonist and duck hunter. Because of his pro-conservation cartoons, he had become one America’s most prominent conservationists by the early 1930s. Joseph P. Knapp (1864-1951) was a prominent businessman, philanthropist, conservationist, and duck hunter who, like Darling, had become concerned about the decline of waterfowl populations. Both worked to reverse this duck decline. Darling was appointed chief of the Bureau of Biological Survey in 1934 by President Franklin Roosevelt. During his short tenure as its chief (1934-1935), he focused the Bureau’s mission more on wildlife conservation and he oversaw the expansion of the national wildlife refuge system. In 1930, Knapp founded the More Game Birds in America Foundation. This Foundation through its waterfowl surveys documented that western Canada was the major breeding ground of ducks in North America. This resulted in the Foundation establishing Ducks Unlimited, Inc. in the US and Ducks Unlimited (Canada) in 1937. DU, Inc. would raise money, and DU (Canada) would spend this money in western Canada on wetland conservation and restoration projects. Both men helped to slow down the loss of wetlands by stressing the need for the public and private sectors to conserve and restore them as waterfowl habitat. They also shaped future wetland science by creating opportunities for the employment of wetland scientists.

INTRODUCTION

By the early 1930s, the United States faced numerous crises: climatic, economic, environmental, and social (Cart 1972, Worster 1979). Among the many longstanding environmental crises that were finally addressed in a significant way during the 1930s was the drastic decline of waterfowl populations. This decline was so severe that many hunters and associations of duck hunters were convinced that duck hunting would soon be impossible or illegal (Phillips and Lincoln 1930, Furtman 2011). This decline in waterfowl populations was in large part due to the drainage of wetlands in breeding areas between 1880 and 1920 that was facilitated by the development of drainage tiles and establishment of drainage

districts (McCorvie and Lant 1993, Allen 2016). Up to the 1930s, wetlands had been largely perceived by most private citizens and many government agencies as wastelands that should be converted to productive use, i.e., to farmland (Prince 1997, Vileisis 1997, Allen 2016).

This decline in waterfowl populations had been occurring for some time, but was exacerbated by the droughts of the 1930s in the Great Plains. These droughts created the “Dust Bowl” that decimated agriculture throughout the region, especially in states like Oklahoma and Kansas (Worster 1979). These droughts affected the entire prairie pothole region, the most important breeding grounds for waterfowl in North America. However, it was not only drainage and droughts that were the underlying causes of the waterfowl population decline. Although downplayed by hunting interests, overhunting of waterfowl had also taken its toll.

Phillips and Lincoln (1930) in the Introduction to their book, *American Waterfowl: Their Present Situation and the Outlook for their Future*, threw down the gauntlet to American waterfowl hunters: “Unless the more intelligent sportsmen can be made to give serious and immediate attention to the many adverse factors which to-day confront our most valuable wild-fowl, we believe it soon will be too late to save these birds in numbers sufficient to be of any real importance for recreation in the future.” American and Canadian sportsmen did rise to the occasion. Their efforts to save duck populations have had a profound effect on the development of wetland science. They resulted in a significant expansion of wetland conservation programs by a US government agency (Bureau of Biological Survey, a forerunner of the Fish and Wildlife Service) and the establishment of a new private organization (Ducks Unlimited) that focused on the conservation and restoration of wetlands.

For any science to develop, there have to be institutions (museums, universities, government agencies, private organizations, etc.) that are focused, at least in part, on that discipline. Not only are new ideas needed to develop a new scientific discipline, but also new job opportunities. Without institutions that hire wetland scientists, wetland science would not exist. Although ante-

¹ Corresponding author: valk@iastate.edu, 515-294-4374

cedent wetland scientists could already be found before the 1930s working in universities and museums (van der Valk 2017, 2018), during the 1930s new institutions arose or expanded that are to this day important employers of wetland scientists.

By the 1930s, there were two very different solutions proposed to reverse the decline in waterfowl populations. One group of individuals and organizations believed the only solution was to increase waterfowl breeding habitat through acquisition and restoration of wetlands by the federal government. Jay “Ding” Darling exemplified this approach. The other approach was based on the European model of game management. This approach was to rear and release waterfowl so that they could be shot by hunters. Initially, Joseph P. Knapp was a proponent of rearing and releasing game birds. In fact, this latter approach had been adopted by a number of state game agencies and private hunting clubs for a few waterfowl species, most notably mallards. A seminal paper by Frederic C. Lincoln (1934) on the efficacy of rearing ducks for release made it clear that this approach would not work. Its title says it all: “Restocking of marshes with hand-reared mallards not proved practical.” These two disparate approaches had a significant implication for the future of waterfowl hunting in North America. The European approach of stocking hard-raised game birds for hunters to shoot would result in “hunting” becoming “shooting”. Raising game birds for release is expensive, and this would eventually make waterfowl hunting a rich man’s sport that would be out of reach to most American hunters (Furtman 2011). This was what many American waterfowl hunters feared.

It is the response of two duck hunters, Jay Norwood “Ding” Darling (1876-1962, Figure 1) and Joseph Palmer Knapp (1864-1951), to the decline in duck populations that is the focus of this paper. Their efforts to save ducks emphasized for the first time the need to stop and even reverse wetland losses. Because they stressed the benefits of wetlands, their efforts eventually resulted in a change in the public’s perceptions of wetlands from mostly negative to positive. They did it in very different, but complimentary, ways. Ding Darling reshaped the waterfowl agenda of an existing US government agency (Bureau of Biological Survey). Joseph Knapp created a new private conservation organization (Ducks Unlimited). To this day, their institutional legacies help to shape wetland policy, management, and science in North America.

JAY “DING” DARLING

Jay Norwood “Ding” Darling (1876-1962) was born in Michigan, but grew up in Sioux City, Iowa. After a false start at Yankton College in South Dakota from which he was ex-

pelled for going on a joy ride with the president’s horse and buggy, he enrolled in Beloit College, WI. His goal was to become a medical doctor. At Beloit his favorite courses were in biology, but he was not an exemplary student. While at Beloit, he began to draw satirical cartoons of some of some of the faculty for the Beloit yearbook. These got him suspended for a year. He finally graduated in 1900. After graduation he got a job with the Sioux City Journal and eventually became its editorial cartoonist. He moved to the Des Moines Register in 1913. Because his editorial cartoons for the Register, many dealing with conservation issues, were published in newspapers around the US, Darling became a nationally recognized and influential advocate for a variety of conservation causes, including reducing soil erosion and wildlife conservation. By the 1930s, he was one of the most visible wildlife conservationist in the US. See Lendt (1979) for a detailed account of Darling’s life and many achievements.



FIGURE 1. Jay Norwood “Ding” Darling hunting in South Dakota in 1931. Source Lendt (1979)

Darling was both a life-long conservationist and staunch Republican. Throughout his career, he used his cartoons to promote a variety conservative political and environmental issues. His first conservation cartoon was published in 1901. It was in support of Theodore Roosevelt's campaign to establish the Forest Service. Because he was an avid duck hunter, one of Darling's major conservation concerns was the decline in waterfowl populations. Like Phillips and Lincoln (1930), he believed that this decline was due to drainage of wetlands in the breeding grounds and to overhunting. Although Darling was a persistent critic of the New Deal, Franklin Roosevelt would call on him to try to help solve the duck decline problem, which had become a political liability for Roosevelt among wealthy sportsmen. Joseph P. Knapp (see the following section for more on him), who was a politically well-connected businessman and conservationist, tried to get the US government more involved in saving waterfowl populations and waterfowl habitat. Knapp's More Game Birds in America Foundation (more on the Foundation in the next section) sent a memo to President Roosevelt that suggested that projects to reverse the waterfowl decline might provide

unemployment relief. These were the kinds of projects that appealed to Roosevelt.

In 1934, in response to criticism for not doing anything to reverse the decline in wildlife populations from conservationists and hunters, President Roosevelt appointed a President's Committee to examine the causes of the duck decline and to make specific recommendations to reverse this decline. He appointed Darling as one of the three members to this Committee on Wild Life Restoration. It is more commonly called the Beck Committee after its chair, Thomas H. Beck. Beck was the editor of *Collier's Weekly*, a popular magazine of the time that had regularly run articles on wildlife conservation issues. *Collier's* was part of a publishing company owned by Joseph P. Knapp. The third member of the committee was Aldo Leopold, who had recently been appointed to a faculty position in game management at the University of Wisconsin and who also had just published a pioneering book on *Game Management* (Leopold 1933). In addition, Leopold had been chair of the Game Policy Institute of the American Game Conference and had helped formulate its influential American Game Policy of 1930. Today Leopold is best known for his book, *A Sand County Almanac*, in which he developed his "land ethic" (Leopold 1949).

The Beck Committee, which was appointed in January 1934, only existed for a short time and issued its report in February 1934. Among the people who helped with this report were John Huntington and Arthur Bartley of Knapp's More Game Birds in America Foundation. The Committee's main charge was to develop a wildlife restoration plan that would "dovetail" with the Roosevelt Administration's marginal land elimination program. Among the Committee's major recommendations were the "acquisition of 4 million acres potentially or actually suitable for migratory waterfowl" and the "purchase of 5,000,000 acres of sub-marginal land suitable for development and management of upland game areas" (Beck et al. 1934). It also requested \$25,000,000 to start land acquisition and an additional \$25,000,000 from existing government New Deal programs for the "restoration and improvement of the lands acquired." In addition, the Beck Committee recommended "A new administrative set-up to insure continued, coordinated, and businesslike execution of the plan for Nationwide restoration and conservation of our wildlife resources." (Beck et al. 1934). This recommendation reflected the lack of confidence in the Bureau of Biological Survey, the main federal agency that was expected to implement the Beck Committee's recommendations, by the Committee, especially its chair Thomas Beck. Beck wanted to recommend that the Bureau be abolished, but this was opposed by Darling and Leopold (Lendt 1979). In fact, the Bureau of



FIGURE 2. Help. A Ding Darling cartoon from the *Report of the President's Committee On Wild Life Restoration* (Beck et al. 1934).

Biological Survey failed to implement the Beck Committee's recommendations. This put the Bureau at odds with conservationists, sportsmen, and politicians. The Bureau's chair ended up resigning because of his failure to act on the Beck Committee's recommendations.

To allay criticism for the failure of the government to take action on the recommendations of the Beck Committee, Roosevelt asked Darling to become the new chief of the Bureau of Biological Survey. The life-long Republican and New Deal critic reluctantly accepted the position. It was a case of put up or shut up. To entice him to take the position, Darling was promised money to expand the refuge system and was given full authority to shake up the Bureau. He started his temporary appointment as chief of the Bureau on March 10, 1934, but with considerable opposition from within the Bureau. Some of his staff considered him incompetent and unqualified (Lendt 1979). The Bureau, although nominally the US Government's main wildlife conservation agency was part of the Department of Agriculture. Consequently, it was not solely focused on wildlife conservation, but was also heavily involved in predator control, i.e., killing wild animals that damaged crops or that killed domestic animals. These predator control programs were anathema to hunters and conservationists. For the short time that he was its chief, Darling tried to broaden the mission of the Bureau and to make it more conservation oriented.

Just few days before Darling was appointed head of the Bureau of Biological Survey, President Roosevelt had signed the Migratory Bird Hunting Stamp Act, or as it is more commonly called, the Duck Stamp Bill. Darling had strongly supported the Duck Stamp Bill and drew the first Duck Stamp (Figure 3). Duck Stamps were, in effect, a federal waterfowl hunting license. Annual revenues from Duck Stamps would provide the funds needed by the federal government to purchase land for waterfowl refuges. This was a turning point in the history of American wetland conservation. Waterfowl hunters had imposed a voluntary tax on themselves to support the preservation, conservation and restoration of wetlands. See Dolin and Dumaine (2000) for a history of the Duck Stamp.

To try to reverse the decline in waterfowl populations, Darling did two things. One, he managed to get a \$6,000,000 appropriation through Congress to fund land acquisition for national wildlife refuges, especially for new waterfowl refuges. Money from Duck Stamps would allow the Bureau to continue to acquire more land for refuges in the future. Two, in 1935 he turned his attention to the over-hunting of waterfowl and he introduced the most restrictive hunting regulations ever seen. They reduced the length of the hunting season and bag limits. There was a significant backlash from waterfowl hunters and members of Con-



FIGURE 3. The first US Duck Stamp. It was drawn by Ding Darling. Source: USFWS Duck Stamp Collection

gress, but Darling held his ground (Lendt 1979). These more restrictive regulations are the basis for current regulations. In addition, Darling established Cooperative Wildlife Units at Land Grant Universities around the US. He had helped to establish such a unit at Iowa State University (then College) prior to coming to Washington.

As chief of the Bureau of Biological Survey, Darling quickly began to shake up its leadership by getting rid of some of its ineffective staff. Among his appointees was J. Clark Salyer II who was only 32 years old when Darling appointed him the first head of the National Wildlife Refuge System. Salyer was to oversee the expansion of the national wildlife refuges from a handful of mostly neglected and unsupervised areas to 279 national wildlife refuges by the time he retired in 1961 (Lendt 1979). Darling also brought to Washington Ira N. Gabrielson who had been working for the Bureau in the northwestern US. Gabrielson became Darling's successor at the Bureau and he would eventually become the first director of the US Fish and Wildlife Service.

In 1935, Darling published an essay, *Conserving our wild life*. Its opening lines provide a clear statement of his vision for the Bureau: "THE BUREAU OF BIOLOGICAL SURVEY is the custodian of all of the wild life species that exist." He goes on to compare the Bureau's mission with that of Noah: "Noah started it. I think he must have been the first member of the Biological Survey! He built the ark to save a pair of all wild life. The only difference between Noah and my personal experience is that he started out in a flood and I started out in a drought." Later in his essay Darling describes the current status of duck populations: "We have taken it as a matter of course that nature provided us with a free gift of all of the ducks we wanted. We have never had to worry about the myriads that have gone North

in the spring, and South in the fall. Now we know that if we don't watch out we won't have any. Some of the very choicest species are on the verge of extinction. ... We have robbed them [ducks] of seventeen million acres of natural nesting areas in the North Central States of the United States, once the most prolific hatching ground in all of our migratory water fowl in this country." He ends his essay on an optimistic note: "I have \$8,500,000 for the Bureau's work -- not a vast amount, but it represents the first money that has ever been put into nesting areas to restore our game. I hope that some day [sic] the \$8,500,000 will produce about one million and a quarter acres of old nesting ground. That ought to produce about 8,000,000 extra ducks and geese and migratory water fowl to pass backward and forward." But it is the final paragraph that is the most revealing: "We are not doing all this for the hunters. I should not be here if all that I was doing was making it possible for people to go out and kill game. My chief interest lies in restoring America to itself." By this he meant restoring the habitat needed by America's wildlife and game birds. It was a complete reimagining of the mission of the Bureau. Needless to say, not all of the Bureau's employees at the time were onboard with their chief's radical new vision. Darling's concept of what was meant by conservation was ahead of its time, but it would eventually become widespread both inside and outside the US government.

During his brief time in Washington, Darling was frustrated by some New Deal programs and policies that negatively impacted wetlands. For example the US Government continued to underwrite the refurbishment and repair of wetland drainage networks by the Civilian Conservation Corps (CCC) while at the same time using the CCC to build infrastructure on new wildlife refuges (Vileisis 2009). Creating jobs and stimulating the economy were much higher priorities for the Roosevelt administration than promoting wildlife conservation. Likewise, Darling was not successful fighting a number of water projects proposed by the federal government (Lendt 1979). He resigned his position as chief of the Bureau of Biological Survey in November 1935 after only 22 months. In his letter of resignation, he wrote that he was leaving "with my tail between my legs!" (as quoted in Lendt (1979)). He had enough of the New Deal.

Darling contributed to the development of wetland science in three major ways: (1) his tireless campaigning on behalf of wetland preservation and restoration raised their visibility as an important national resource, not just for waterfowl hunters, but among the general public; (2) his reform of the Bureau of Biological Survey laid the foundation for increased efforts by the US government to conserve and protect wetlands through the establishment of waterfowl refuges; and (3) his efforts within the US government

to develop programs to conserve, protect, and study wetlands would create important job opportunities for wetland scientists as managers and researchers within federal and state agencies. In short, Darling efforts on behalf of waterfowl advanced the development of wetland science by establishing or expanding institutions that would protect wetlands and employ wetland scientists.

JOSEPH PALMER KNAPP

The founding of Ducks Unlimited has been chronicled in a number of books, including Farrington (1945), Tennyson (1977), Leitch (1978), Furtman (2011), and Batt (2012). Of these Leitch's (1978) and especially Tennyson (1977) are based on interviews of Arthur M. Bartley (1892-1981), who was the first executive director of Ducks Unlimited Inc. Bartley was involved in the establishment of More Game Birds In America and its successor, Duck Unlimited, from their beginning. Furtman (2011) based his account more on archival materials from the More Game Birds in America Foundation in the Ducks Unlimited, Inc. archives. My account is based primarily on Leitch (1978), Tennyson (1977), and Furtman (2011).

Joseph Palmer Knapp (1864-1951) was a wealthy American businessman and philanthropist. Like Ding Darling, he was also a keen duck hunter and like Ding Darling he wanted to reverse the calamitous decline in duck populations that had occurred in North America. To this end, in 1930 he founded and largely funded the More Game Birds in America Foundation. John Huntington was the new foundation's vice-president and Arthur Bartley, Huntington's navy buddy, was its director of field activities. John Huntington was the son of Dwight Huntington who had founded the Game Conservation Institute in 1912. Arthur Bartley was at one point the director of this Institute. Dwight Huntington considered game birds to be a crop and viewed game bird management as a form of crop management, i.e., farming. In other words, game birds could be raised like corn or rice. For this to work, however, game bird farming had to be based on sound business practices. Dwight Huntington's emphasis on sound business practices as the basis of conservation efforts would have a profound impact on Joseph Knapp and his conservation efforts.

As the More Game Birds in America Foundation's name makes clear, it was established to reverse the decline in game birds, especially waterfowl, that threatened the future of game bird hunting. As with other conservation groups, the Foundation believed that the declines in game bird populations was due primarily to loss of habitat and overhunting. The new Foundation published its manifesto, *More Waterfowl by Assisting Nature*, in 1931 (Figure 5). The anonymous author in the Forward of this manifesto

made it clear that the Foundation was proposing “a comprehensive, sound, adequate, workable, and properly financed plan for preserving and increasing waterfowl.” It would also “take no account of international boundaries.” It outlined in detail the Foundation’s business plan for saving ducks, including a budget. Duck hunters were asked to step up and do their share. What was proposed was not another government program, however, but a privately funded effort. The major features of the proposed plan of More Waterfowl by Assisting Nature are found in Figure 6.

As we saw in the previous section on Ding Darling, a memo from More Game Birds in America to President Roosevelt and similar efforts by other conservationist and hunting interests triggered the establishment in January 1934 of the Beck Committee. It took the Beck Committee only about a month to write its report, which was issued on February 8, 1934. As was previously noted, the chair of the Committee, Thomas Beck, was employed by the publishing company owned by Joseph Knapp. As noted, the Beck Commission’s recommendations were ignored by the Bureau of Biological Survey, but this did not deter Joseph Knapp.

The More Game Birds in America Foundation initially focused on raising and releasing upland game birds, but it espoused a different strategy for restoring waterfowl populations. To produce more waterfowl would require more waterfowl breeding habitat. Thus the focus of the Foundation’s waterfowl-related efforts would be on conserving and restoring waterfowl habitat. The main question facing the Foun-

ation was where it should be doing this. Arthur Bartley, who was an employee of the Foundation from its beginning, made annual trips to western Canada to assess the status of the region’s breeding duck populations. This resulted in him becoming acquainted not only with the waterfowl breeding grounds of western Canada but also with many of the region’s businessmen, government officials, sportsmen, and politicians interested in waterfowl. Increasingly the Foundation focused its attention on western Canada.

In 1933, the More Game Birds in America Foundation published *The Duck decline in the Northwest*. This report included data on the status of ducks in western Canada. The report confirmed the importance of western Canadian breeding grounds for North American waterfowl production, and it also highlighted the threats to this production due to expanding drainage. In addition, this report pointed to the need for better data on waterfowl populations in North America. The More Game Birds in America Foundation decided to collect this data, and it organized a waterfowl survey of the duck breeding regions of the US and western Canada. The Foundation recruited state and provincial fish and game departments to do most of the field work with John Huntington overseeing the survey in Manitoba and Arthur Bartley in Alberta.

A major practical problem facing the proposed waterfowl survey was how to collect data on waterfowl numbers in parts of western Canada that had few, if any, roads. After some experimental flights in Manitoba and Saskatchewan



FIGURE 4. Joseph P. Knapp (1864-1961). From his obituary in the New York Herald Tribune, January 4, 1951.

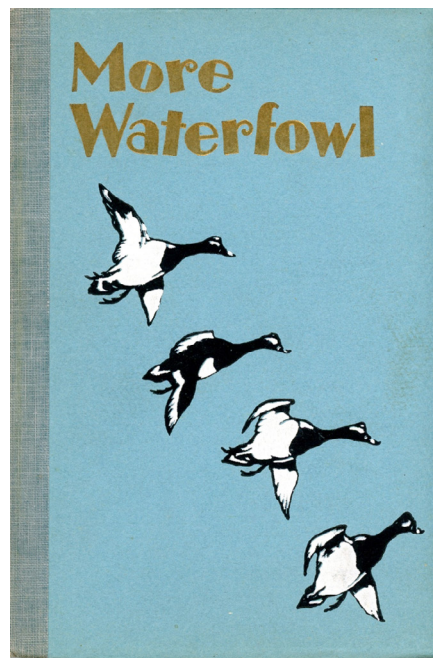


FIGURE 5. Cover of *More Waterfowl* by Assisting Nature. More game Birds in America Foundation (1931). Public domain.

A BRIEF OUTLINE OF THE PLAN

An International Agency to be created to increase migratory waterfowl production and to disburse,

Ample funds, to be raised by a cent-a-shell tax, supplemented by such governmental appropriations as may be obtained, to promote production expeditiously and with the highest efficiency by acquiring,

Breeding grounds, preferably by purchase, wherever they exist or can be restored in the United States and Canada—hundreds of thousands of acres—to be efficiently supervised by,

Game bird management forces to (1) control water levels and provide ample supply of food and cover, (2) control natural enemies where necessary, (3) prevent fires, stop unauthorized grazing and suppress shooting on these breeding grounds.

Refuges to be established by the Agency for use of wildfowl on northern and southern flights, coordinated with a system of

Concentration areas for winter use.

FIGURE 6. The plan of the More Game Birds in America Foundation’s (1931) *More Waterfowl* by Assisting Nature. Public domain.



FIGURE 7. John C. Huntington (left) and Arthur Bartley during the 1935 International Wild Duck Census. Source Tennyson (1977).

to see if it was feasible to count ducks from an airplane, Arthur Bartley became convinced that this would be an efficient way to monitor the status of waterfowl in areas that could not be reached by road. Consequently, aerial surveys of duck abundance were done to supplement the other data being collected. Most of the survey, however, was done on the ground by about 1,500 volunteers or employees of wildlife agencies.

The More Game Birds in America Foundation quickly and successfully conducted the first international inventory

of waterfowl and published its findings in *The 1935 International Waterfowl Census*. Their survey estimated that there were 40,000,000 ducks in Canada and only 2,200,000 in the US. Although there was some uncertainty about the accuracy of the estimated size of the duck population, the survey did establish that such an international survey of waterfowl was practical and subsequently such surveys became annual events. More importantly, the report demonstrated conclusively that the future of duck populations was tied to the fate of wetlands in western Canada.

Efforts to improve waterfowl conservation in the US, which had started when Ding Darling became chief of the Bureau of Biological Survey, could not be extended to Canada because of legal restrictions on spending US government funds outside the country. Because the More Game Birds in America Foundation's duck inventory had shown that 95% of midcontinent ducks come from western Canada, the Foundation quickly developed a plan to help conserve and restore wetlands in this region. In 1936, the Foundation published *Ducks Unlimited, a practical plan to perpetuate and improve duck shooting in the United States by the production of millions of more wild ducks annually through the restoration and businesslike management of Canadian duck breeding grounds*. The title literally is a succinct summary of their proposed plan. The new Ducks Unlimited would direct its efforts on western Canadian waterfowl breeding grounds using a two pronged approach.

The Foundation's plan was to establish a new non-profit organization in the US called Ducks Unlimited, Inc., which would raise money to be sent to another new organization in Canada, Ducks Unlimited (Canada), which would work on waterfowl conservation projects in western Canada. Both the American and Canadian non-profit corporations were established in 1937. With the creation of Ducks Unlimited, Inc., the More Game Birds in America Foundation effectively ceased to exist, and its staff became the initial staff of Ducks Unlimited, Inc. The establishment of Ducks Unlimited reinforced the idea that duck hunters would need to fund efforts to preserve and eventually increase waterfowl populations.

The establishment of Ducks Unlimited (DU) is an important milestone in the history of wetland science. DU emphasized the need to preserve and enhance breeding waterfowl habitat, i.e., wetlands. Because of its extensive fund-raising network in both the US and Canada to support its conservation programs, DU has done a great deal to improve the visibility of wetlands among the general public in both countries. Although it does not have a large number

of scientific staff, it has been and continues to be a significant employer of wetland scientists and in recent years a funder of wetland science research.

CONCLUSIONS

Adversity often produces opportunity. The waterfowl population crisis in North America by the 1930s resulting from habitat loss, overhunting, and drought created such adverse conditions for waterfowl hunters that they began to believe that the future of waterfowl hunting was in peril. Two duck hunters, Jay “Ding” Darling and Joseph P. Knapp, used this crisis to propose ways to try to reverse this decline of waterfowl. Darling used his editorial cartoons to raise public awareness of the problem and then reluctantly agreed to become the chief of a government agency, Bureau of Biological Survey, during the Roosevelt administration. He turned this agency into a more conservation-minded institution and successfully raised money for the purchase of more land for the national wildlife refuge system. Darling also reformed hunting regulations to bring them more into line with contemporary waterfowl population sizes. Joseph Knapp through his More Game Birds in America Foundation demonstrated the overwhelming importance of wetlands in western Canada as breeding habitat for North American waterfowl. This resulted in a plan by the Foundation to establish two new, interlinked organizations in the US and Canada. The America organization, Ducks Unlimited, Inc., would raise money. This money would fund the wetland conservation and restoration programs of the second organization, Duck Unlimited (Canada), in western Canada. Darling and Knapp not only helped halt the decline in wetland losses and waterfowl populations, but they also raised awareness of the importance of wetlands among the general public. Both also expanded existing or created new institutions that would play an important role in developing wetland policy and in improving wetland management in the US and Canada as well as providing jobs for wetland scientists. ■

REFERENCES

- Allen, D. 2016. Conservation competition: perspectives on agricultural drainage during the New Deal. MA Thesis, Case Western Reserve University, Cleveland, OH.
- Batt, B. 2012. The marsh keepers journey: the story of Ducks Unlimited Canada. Ducks Unlimited Canada, Winnipeg, Manitoba.
- Cart, T.W. 1972. “New Deal” for wildlife: a perspective on federal conservation policy, 1933-1940. *The Pacific Northwest Quarterly* 63:113-120.
- Beck, T.H., Darling JN, Leopold A. 1934. Report of the President’s Committee On Wild Life Restoration. United States Government Printing Office, Washington, DC.
- Darling, J.N. 1935. Conserving our wild life. Recreation. Available online from the University of Iowa’s The Papers of Jay Norwood “Ding” Darling. (<http://www.lib.uiowa.edu/scua/msc/tomsc200/msc170/wildlife.html>)
- Dolin, E.J. and B. Dumaine. 2000. *The Duck Stamp story: art, conservation, history*. Krause Publications, Iola, WI.
- Farrington, S.K. 1945. *The ducks came back: the story of Ducks Unlimited*. Coward-McCann, New York, NY.
- Furtman, M. 2011. *The Ducks Unlimited story: Conservation for generations*. Ducks Unlimited, Inc. Memphis, TN.
- Lendt, D.L. 1979. *Ding: the life of Jay Norwood Darling*. Iowa State University Press, Ames, IA.
- Leitch, W.G. 1978. *Ducks and man: Forty years of co-operation in conservation*. Ducks Unlimited (Canada), Winnipeg, Manitoba.
- Leopold, A. 1933. *Game management*. Charles Scribner, New York, NY.
- Leopold, A. 1949. *A Sand County almanac*. Oxford University Press, New York, NY.
- Lincoln, F.C. 1934. Restocking of marshes with hand-reared mallards not proved practicable. pp. 310-313. *Yearbook of Agriculture, 1934*. US Department of Agriculture, Washington, DC.
- McCorvie, M.R. and C.L. Lant. 1993. Drainage district formation and the loss of Midwestern wetlands, 1850-1930. *Agricultural History* 67:13-39.
- More Game Birds in America. 1931. *More waterfowl by assisting nature*. More Game Birds in America Foundation, New York, NY.
- More Game Birds in America. 1933. *The duck decline in the Northwest: a report on the prairie duck-breeding region*. More Game Birds in America Foundation, New York, NY.
- More Game Birds in America. 1935. *The 1935 international wild duck census; a report on the duck population in Alberta, Saskatchewan, Manitoba, North Dakota, South Dakota and Minnesota during August, 1935*. More Game Birds in America Foundation. New York, NY.
- More Game Birds in America. 1936. *Ducks Unlimited, a practical plan to perpetuate and improve duck shooting in the United States by the production of millions of more wild ducks annually through the restoration and businesslike management of Canadian duck breeding grounds*. More Game Birds in America Foundation, New York, NY.
- Phillips, J.C. and F.C. Lincoln. 1930. *American waterfowl: their present situation and the outlook for their future*. Houghton Mifflin, Boston, MA.
- Prince, H. 1997. *Wetlands of the American Midwest: a historical geography of changing attitudes*. University of Chicago Press, Chicago, IL.
- Tennyson, J.R. 1977. *A singleness of purpose: the story of Ducks Unlimited*. Ducks Unlimited, Chicago, IL.
- van der Valk, A.G. 2017. Antecedent wetland ecologists - German and Austrian in the Ninetieth Century. *Wetland Science and Practice* 34:112-117.
- van der Valk, A.G. 2018. Stephen A. Forbes, antecedent wetland ecologist? *Wetland Science and Practice* 35:18-24
- Vileisis, A. 1997. *Discovering the unknown landscape: a history of American wetlands*. Island Press, Washington, DC.
- Worster, D. 1979. *Dust bowl: The southern plains in the 1930s*. Oxford University Press, New York, NY.