



HISTORY AND FUTURE OF OUR NATIONAL WILDLIFE REFUGE SYSTEM

Brought to You by the
NATIONAL WILDLIFE REFUGE ASSOCIATION

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This project is dedicated to 2 purposes:

- 1) To collect key information on the history of the National Wildlife Refuge System, acknowledging the commitment and perseverance of the many people, both the well-known and perhaps more importantly the multitude of unsung heroes, who have thus far worked so diligently to establish, protect, and steward the System and provide for its public enjoyment; and
- 2) To encourage readers to continue working to expand and appropriately steward the System until the full spectrum of America's rich legacy of fish, wildlife, and plants is securely protected and appropriate associated public use of these areas is provided for the enjoyment and enrichment of our nation's current and future citizens.



This is brought to you courtesy of the National Wildlife Refuge Association, the leading independent voice focusing on protecting and promoting the National Wildlife Refuge System, the world's largest network of lands and waters set aside for the conservation of our nation's rich legacy of fish, wildlife, and plants.

Founded in 1975, the Refuge Association's mission: As the leading independent voice advocating on behalf of the National Wildlife Refuge System, we protect, promote and enhance America's wildlife heritage through strategic programs that serve the System and wildlife beyond its boundaries.

We rally together refuge Friends groups and volunteers, birders, hunters, anglers, ranchers, students and other conservation nonprofits to create a collective voice for the Refuge System. And, we cooperate with the U.S. Fish and Wildlife Service to help enable Refuge System employees to efficiently and effectively accomplish an ambitious conservation mission for the benefit of the American public.

Readers, please note: Describing the history and future of the National Wildlife Refuge System is a major undertaking and many elements could be included here. This is a living document subject to addition and refinement over time. If you have additions or corrections please send them to NWRS.History.Future@gmail.com and we will work to incorporate new materials into the next edition.

A few observations from those who have gone before:

“Man is still close to the primitive. Despite living in a mechanized industrial age, he still responds to the call of the wild. The strident-voiced geese breasting their course through storm-driven mists, the thundering-hoofed herds of buffalo that cut deep trails through the dusty plains in their mass migrations, the circling cranes, their hoarse gutturals dripping back to earth long after the birds themselves have vanished in the blue, the salmon in mighty leap driven by the spawning urge to return to natal waters, and waterfowl with their myriad wings winnowing out a symphonic music -- these and others have, and so far as they still remain, set the blood of man racing and tingling through his veins.”

- Ira Gabrielson former FWS Director, 1943 in “Wildlife Refuges”

“If you travel much in the wilder sections of our country, sooner or later you are likely to meet the sign of the flying goose-the emblem of the National Wildlife Refuges. You may meet it by the side of a road crossing miles of flat prairie in the Middle West, or in the hot deserts of the Southwest. You may meet it by some mountain lake, or as you push your boat through the winding salty creeks of a coastal marsh. Wherever you meet this sign, respect it. It means that the land behind the sign has been dedicated by the American people to preserving, for themselves and their children, as much of our native wildlife as can be retained along with our modern civilization. Wild creatures, like men, must have a place to live. As civilization creates cities, builds highways, and drains marshes, it takes away, little by little, the land that is suitable for wildlife. And as their space for living dwindles, the wildlife populations themselves decline. Refuges resist this trend by saving some areas from encroachment, and by preserving in them, or restoring where necessary, the conditions that wild things need in order to live.”

- Rachel Carson former FWS writer, 1947 in preamble to the “Conservation in Action” series

“Refuges are places where the music of life has been rehearsed to perfection, where nature's colors are most vibrant, where time is measured in seasons, and where the dance of the crane takes center stage. They are gifts to ourselves and to generations unborn -- simple gifts unwrapped each time a birder lifts binoculars, a child overturns a rock, a hunter sets the decoys, or an angler casts the waters.”

- Tom Worthington former NWRS Deputy Regional Chief, 1996 in “The NWRS—Promises for a New Century”

“National wildlife refuges are places where a child can be filled with wonder as they watch a bobber slip under the water for the first time. Where kids can see the sky filled with wild birds from far away places and fill their imaginations wondering where they came from and to where they will fly. They will hear sounds like the piping of a plover sung against a chorus of wind and surf that cannot be downloaded from the internet. And in more than one special place, they can discover a pasque flower and immediately know its special magic, which they will never forget. These are moments of sharing that can bind families and friends together, gently soothing our ancient urge for a connection to the natural world. In our frantically paced world, opportunities for adventure and exploration coupled with moments of solitude and reflection are a perfect prescription for the modern stresses we all feel.”

- Jim Kurth former NWRS Chief, 2004 at the Conservation in Action Summit

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FORWARD

Nearly a hundred and twenty years in the making, the National Wildlife Refuge System (NWRS or Refuge System) is the world's largest network of lands and waters dedicated to the conservation of fish, wildlife, and plants. It is a unique gift that America has given itself. It helps safeguard our nation's rich legacy of nature and provides benefits, enjoyment, and enrichment to our citizens. It conserves wildlife, provides unparalleled outdoor experiences, protects a healthy environment, and preserves a rich natural heritage that adds to the quality of life for both present and future generations. It is managed by the U.S. Fish and Wildlife Service (FWS) within the Department of the Interior.

The materials that follow tell the Refuge System story. It is a story that is part science and part poetry, and is grounded in the affinity for nature that is inborn in the human soul. The refuges, wetland management areas, and national monuments of the Refuge System have inspired millions and portend even greater benefits to future generations. This is your invitation to:

- dig deeper; to learn more about how these special places have come to be protected for the enjoyment of all, and
- develop an appreciation for the fact that continued diligence is essential to assuring that this natural legacy is passed on unimpaired to future generations of Americans.



One of the most iconic caricatures of the Refuge System is this drawing by FWS biologist and wildlife artist Kent Olson who used his talent for drawing to conserve fish and wildlife. His career spanned from 1958 to 1990.

Our nation is rich in animal and plant life. Thousands of species of native and migratory birds, reptiles, fish and mammals as well as thousands of species of plants call the U.S. home. Animals have the same needs we do. They need space to rest, safe areas to rear their young, and access to healthy food and water. National wildlife refuges and wetland management districts are places where many of our nation's animals find the habitat they need to survive. Most species of birds (700 of 786), fish (1,000 of 1,154), reptiles and amphibians (250 of 311) are found on refuges, and nearly half of the mammal species (220 of 428). Over 380 species that are threatened or endangered make their homes on refuges. Protecting a portion of every major habitat type in the country, the Refuge System is the nation's single most important system of lands and waters set aside to protect our rich wild heritage. Secure protection

afforded by the Refuge System makes these areas “anchors” for biodiversity; however, benefits accrue far beyond refuge boundaries as many species migrate over wide geographic areas.

By providing life requisites for fish, wildlife, and plants; the Refuge System contributes to the quality of life of all Americans. Collectively, these benefits are often described as ecosystem services. Two of the most important provided by the Refuge System are:

1. **Natural Regulating Services:** These services help make life possible for people. Plants clean air, filter water and sequester carbon; bacteria decompose wastes; bees and other pollinators pollinate flowers including agricultural crops; plant roots hold soil in place to prevent erosion, wetlands/floodplains/coastal zones reduce storm damages and flooding. These processes work together to make ecosystems clean, sustainable, functional, and resilient to change. Of particular impact within the Refuge System is the reduction or mitigation of flood or storm damages as many refuges are located in floodplains or coastal zones.
2. **Cultural Services:** Cultural services are non-material benefits that contribute to the inspiration, development and cultural advancement of people. They include ecosystems role in local, national, and global cultures; recreation and tourism including physical and mental well-being; building of knowledge and spreading of ideas; creativity born from interactions with nature (music, art, photography, prose/poetry); and spiritual/aesthetic/sense of place services (solitude, wilderness experience, religious connections). These are major services provided by the Refuge System as excellent nature and wilderness experiences are readily available at a large number of locations throughout the country. The sense of place provided by units of the Refuge System is a strong benefit for current generations as well as a strong “legacy” that instills a desire to conserve nature to benefit future generations. The Refuge System provides important recreational and tourism destinations in communities across the U.S. and has over 65 million visits each year. A variety of recreational opportunities are available with priority given to 6 wildlife-dependent uses: hunting, fishing, wildlife observation, photography, environmental education, and interpretation. Further, benefits extend far beyond refuge boundaries as inspiration of nature photography, writings, and narrative of shared experiences is disseminated.

Throughout much of its history since its inception in 1903, the Refuge System struggled with being a loose assemblage of lands rather than being a “system”. The remedy to this challenge was provided in 1997 in the “Refuge System Improvement Act of 1997” which among other provisions established a mission for the Refuge System (see below text box). Pursuit of this noble mission along with other provisions of the Improvement Act have done much to focus and unify management of the Refuge System.

The mission of the Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats for the benefit of present and future generations of Americans.

This network of 568 national wildlife refuges, 5 Marine National Monuments and 38 wetland management districts today totals 837 million acres. An additional 19.1 million acres of Marine National Monuments is managed under authorities other than the Refuge System Administration Act; thus, the Refuge System is responsible for a total of about 856 million acres. Refuges and

wetland management districts span from the Arctic Ocean to the South Pacific and from Maine to the Caribbean. There is at least one national wildlife refuge in every state and territory and within an hour's drive of most major cities. Although refuges are located throughout the U.S. and its territories, Alaska refuges with large expanses of land and Marine National Monuments with large expansions of ocean habitats dwarf the size of most refuges in the lower 48 states. An overview of the Refuge System is in the table that follows. Selected information on individual units of the System is in Table 8 near the end of this document (all statistics are as of September 30, 2022). Also, Wikipedia contains a significant amount of information especially about individual refuges and this site https://en.wikipedia.org/wiki/List_of_National_Wildlife_Refuges_of_the_United_States# is a useful launching point for information about individual refuges.

Refuge System Geographic Overview

For a map of the Refuge System see <https://www.fws.gov/sites/default/files/documents/NWRS-National-Map.pdf>

GEOGRAPHIC AREA	NUMBER UNITS	SIZE (million acres)	NOTES
State of Alaska	16 NWR	76.8*	9% of total Refuge System acreage is in Alaska; 18% of Alaska is set aside as national wildlife refuges
Marine National Monuments, Pacific Islands, and Hawaii	22 NWR 5 MNM	759.7	About 88% of System acres are in 5 Marine National Monuments consisting mostly of coral reefs and open ocean (4 Pacific and 1 Atlantic). Acres here include 19.1 million Pacific acres managed under authorities other than the Refuge System Administration Act.
Puerto Rico, Virgin Islands, & Navassa NWR	9 NWR	0.4	The largest refuge in the Caribbean is the remote Navassa Island which is nearly 365,000 acres
Lower 48 states	521 NWR 38 WMD	19.1	2% of NWRS acres are in the lower 48 states; 1% of the area of the lower 48 states is within the NWRS; by unit count, 92% of refuges are in the lower 48; 521 are refuges (14.69 million acres) and 38 are wetland management districts (4.44 million acres)
Entire System	611	856.0	568 refuges, 5 Marine National Monuments, and 38 wetland management districts

*Alaska acre estimates in the above are from the 1980s. Improved satellite data and cadastral tools available today indicate actual acreage is larger than indicated here.

**The term refuge as used here includes Refuge System lands, waters, and interests administered as wildlife refuges, wildlife ranges, wildlife management areas, game preserves, and conservation areas. A Wetland Management District is an administrative collection of Waterfowl Production Areas and easements comprised of small natural wetlands and grasslands that provide breeding, resting, and nesting habitat for waterfowl, shorebirds, grassland birds, and other wildlife. About 95% of Wetland Management Districts are in the Prairie Pothole states of IA, MN, MT, ND, and SD. Coordination areas are not included in the above tally. Coordination areas are managed by states under cooperative agreements and include 50 units that encompass nearly 258,000 acres

This document summarizes the history of the Refuge System and takes a brief look into the future to highlight the fact that finishing the task so far begun calls for continued growth of the System and dedication to guarding and properly managing lands once they are protected.

This discussion would not be complete without mentioning that conserving our nation's fish, wildlife and plants and developing and managing the Refuge System is a cooperative effort.

Engaging with partners of every kind; state, federal, or local; government or non-government has been critical to the successes of the Refuge System. Behind the establishment of every new refuge have been champions of conservation with the vision and passion to urge action. It is beyond the scope of this document to identify each of these individuals but collectively they have had a profound impact. Another type of cooperative conservation occurs through the help of volunteers and “Friends”. Every year, about 38,000 volunteers and approximately 200 refuge “Friends” organizations contribute more than 1.3 million hours of volunteer assistance while also being an important link to local communities.

If you are new to the Refuge System, you are encouraged to see [A Beginner's Guide to the National Wildlife Refuge System](#) and <https://www.fws.gov/story/how-best-enjoy-wildlife-refuge>.



Signs such as the one above mark the entry point to most refuges

HISTORICAL ERAS OF THE NATIONAL WILDLIFE REFUGE SYSTEM

The history of the 120-year-old Refuge System is summarized in the sections that follow. To make materials easier to keep in mind, they are divided into eras of time where similar factors had a dominant influence on the System. Each era includes a narrative overview followed by a timeline of key events and publication references. The division of historical eras is:

- ERA 1. **SETTING THE STAGE FOR PROTECTED LANDS (1850-1900)**
- ERA 2. **THE EARLY YEARS, TEDDY ROOSEVELT LEADS THE CHARGE (1903-1913)**
- ERA 3. **MIGRATORY BIRD HABITATS A CONTINUING FOCUS (1914-1953)**
- ERA 4. **A LOOSE COLLECTION BEGINS TO EMERGE AS A SYSTEM (1954-1979)**
- ERA 5. **ALASKA, NORTH AMERICA'S SERENGETI (1980)**
- ERA 6. **THE SYSTEM CONTINUES TO MATURE (1981-2003)**
- ERA 7. **STRENGTHENING THE MARINE DIMENSION (2004-2022)**



Era #1: SETTING THE STAGE FOR PROTECTED LANDS (1850-1900)

This era marks the half century leading up to establishment of the first national wildlife refuge. From the standpoint of wildlife, this half century brought the greatest slaughter of wildlife in our nation's history. The convergence of factors including a huge influx of immigrants, westward expansion and settlement, improved transportation including railroads and steamboats, growing availability of increasingly lethal firearms, unregulated market hunting for wildlife, increasing mechanization especially in agriculture, and government assistance through homesteading and wetland drainage combined to take a severe toll on wildlife. By the later part of this era, it was increasingly clear that steps needed to be taken to conserve our nation's fish and wildlife or else many species would be gone forever.

The U.S. saw dramatic change in the second half of the 19th century. The population grew from 23 (85% rural) to 76 (60% rural) million in these 5 decades. The Civil War (1861-1865) was obviously a major disrupter. In many ways, however, the U.S. came of age in the decades following the Civil War, the frontier gradually vanished; what began as a wilderness and rural republic still had farming as the major occupation for the average American but signs of an urban nation were beginning to emerge. The industrial revolution was underway and great factories, steel mills, and transcontinental railroads were built. Cities grew quickly. Railroad transportation and steamboats opened up new areas to settlement. Railroad expansion was especially detrimental to buffalo as it provided ready access to hunting grounds along with a

method to transport hides and meat to market. This contributed greatly to the massive killing of buffalo in the 1860s to 1880s.

The country expanded from 31 states in 1850 to 45 by 1900 (OK, AZ, NM, AK, and HI were not states yet). Alaska was purchased in 1867. An immigration wave unlike any the world has ever seen brought millions of people (mostly European) to the U.S. to seek better lives. The human population shifted from 85% rural in 1850 to 60% rural in 1900. Railroads and canals expanded settlement and commerce. This growing population expanded its reach into new areas and along with advances in technology placed dramatically increased demands on resources such as timber, water and wildlife. Major changes in land use were underway as forests, wetlands, and prairies were converted to agricultural and other commodity uses. Advances in the manufacturing of firearms and ammunition made it possible to take large numbers of wildlife with increasing efficiency. Growing cities created a demand for marketing wildlife for human consumption, and market hunting for wildlife was largely unregulated.

Edward Howe Forbush in his 1912 book "A History of the Game Birds, Wild-Fowl and Shore Birds of Massachusetts and Adjacent States"

https://upload.wikimedia.org/wikipedia/commons/3/38/A_history_of_the_game_birds%2C_wild-fowl_and_shore_birds_of_Massachusetts_and_adjacent_states..._with_observations_on_their..._recent_decrease_in_numbers_%28IA_historyofgame00forb%29.pdf described the impact of railroads on wildlife this way:

"It was the unsettled wilderness, and the wilderness alone, which so far had maintained the supply (*referring to the abundance of wild game*); but when, in the latter part of the nineteenth century, railroads began to extend throughout the great west and northwest, a rapid extermination of game commenced, such as was never known before in the world's history. The railroads carried settlers into the wilderness, and opened to them the markets of the east.

Before the advent of the railroads, game had been plentiful and cheap in the markets of the western cities. Audubon says in his journal that in 1843 at St. Louis the markets abounded with the good things of the land: Grouse could be had two for a York shilling; Turkeys, wild or tame, twenty-five cents each; Ducks, three for a shilling; Wild Geese, ten cents each; and Canvas-backs, a shilling a pair. When the railroads reached the country tributary to St. Louis, and thus connected it with eastern markets, building up also great markets in the central west, the prices of game gradually rose, while the game rapidly decreased. The fame of America as a game country was noised far and wide. Hunters and sportsmen came from every land; sportsmen, market hunters, big game hunters and skin hunters crowded into the new country. The improvement in firearms kept pace with the increased transportation facilities. The breech-loader gave the hunter an added advantage. Then followed the practical extermination of the American bison, the deer, elk, antelope, mountain sheep, mountain goat, Wild Turkey and Prairie Chicken over wide areas. Then first began the marked decrease in the numbers of game birds, shore birds and wildfowl throughout most of the United States and British America . . ."

During this era, the beneficial values of wetlands were not recognized. They were generally viewed as wastelands that should be drained and converted to more beneficial use. In 1849, Congress passed the first of the Swamp Land Acts, which granted all swamp and overflow lands in Louisiana to the State for reclamation. Subsequent amendments in 1850 and 1860 extended the Act to 14 additional States. Cumulatively, these provisions resulted in a loss of an estimated 65 million acres of wetlands.

A sweeping boost to settlement and agricultural expansion occurred under the Homestead Act of 1862. From its enactment until its repeal in 1976, it transferred about 270 million acres of land

(14 percent of the contiguous 48 states) from federal government to private ownership. This incentivized European immigrants to seek new lands to settle and convert to agricultural use.

Also, in agricultural activity throughout the country, new kinds of machinery dramatically increased the ability to till more land and to convert wetlands to farmlands. Huge wheat farms were operating in the Dakota Territory by 1875. New mechanical seeders, harrows, binders, and threshers, designed specifically for wheat production, were used to cultivate large tracts of land for these farms. Many wetlands were lost as a result.

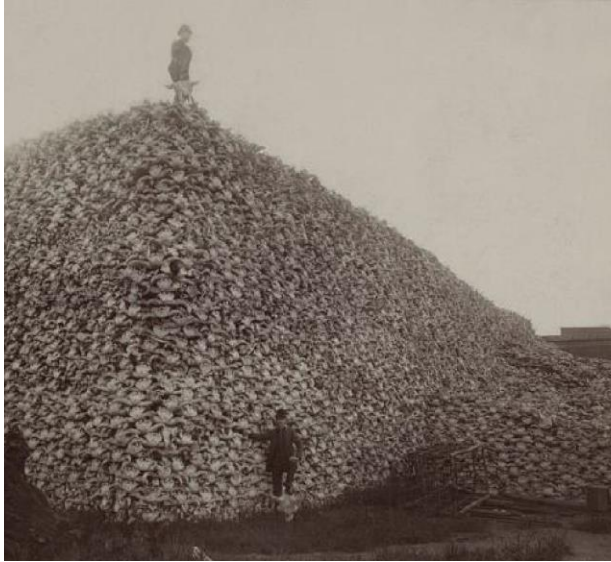
Improvements in drainage technology greatly affected wetland losses especially in the East and the Midwest. As the use of steam power expanded, it replaced hand labor for digging drainage ditches. Also, the production and installation of drainage tiles increased rapidly. By 1880, 1,140 factories located mainly in Illinois, Indiana, and Ohio manufactured drainage tiles to be used to drain wetlands for farming. By 1882, more than 30,000 miles of tile drains were operating in Indiana alone. By 1884, Ohio had 20,000 miles of public ditches designed to drain 11 million acres of land.

During this era, especially in the frontier and rural areas of the country, fish and wildlife were largely considered to be fruits of the land free for the taking for use in subsistence, for sale, or to be disposed of at will especially if they interfered with agricultural or other enterprises. New immigrants often traveled to less settled areas where land and wildlife seemed unlimited. Some game protection laws were being enacted in more populated areas but for the majority of the country, there were few "game" laws such as closed seasons or limits on take and no consideration for needing to conserve or manage fish and wildlife. Market hunting was prevalent and contributed to the decline of many wildlife species. Waterfowl were hunted with deadly punt guns and battery guns that allowed for taking of large numbers of birds. It is reported that in the 1870s, it was not unusual for a single gunner on the Chesapeake Bay to take upwards of 15,000 birds in a single day using these weapons.

As time moved on, the notion of endless abundance changed. Game protection laws began at the state level in more populated areas. In the more populated East, authors such as George Perkins Marsh (1859) observed that human activity was degrading the natural world. Henry David Thoreau in 1851 expounded on the human condition and noted that "in wildness is the preservation of the world"; and in his 1864 publication "The Maine Woods" he advocated for establishment of national preserves of virgin timber that would serve "not for idle sport or food, but for inspiration and our own true re-creation". John Mitchell in his article "Gentlemen Afield" describes some of the forces at play during this era of history

<https://www.americanheritage.com/gentlemen-afield>

The rapid decline of two iconic wildlife species would add to an emerging awareness that human activity was taking its toll on wildlife. The American bison or buffalo, once numbering 30 to 60 million animals, had declined to about 1,000 animals by 1889. The passenger pigeon, once numbering an estimated 3 to 5 billion birds, was thought to be so numerous and so prolific as to always be abundant but they were nearly gone by the turn of the century.



*This mid-1870's photo of a mountain of buffalo skulls in the Midwest is indicative of the extent of slaughter of buffalo by settlers.
(Wikimedia public domain)*



An artist rendering of a group of men in Louisiana in the 1870's shooting passenger pigeons for sport (Wikimedia public domain)

As time progressed, other developments signaled the need for fish and wildlife conservation and an emerging awareness of the need to change direction or else many species would be in peril of becoming extinct. The time of endless exploitation was coming to a close and a new day was beginning to emerge that called for conservation of resources and consideration of the needs of future generations of Americans. Among the signals:

- In 1889, Congress designated the Pribilof Islands in Alaska as a national reserve to protect fur seals. This is believed to be the first recognition by Congress of a federal role in wildlife conservation and management.
- Many states would have some form of “game” laws”; these laws were increasingly growing in breadth and were beginning to include at least the beginnings of enforcement programs
- Sport hunting would replace market hunting as the primary focus in the taking of wildlife; ethics of sport hunting would advance. In many areas, especially for waterfowl hunting, lands would be purchased and hunt clubs established. These clubs in many cases introduced conservation measures such as limiting take, eliminating spring hunts, hunting etiquette, sanctuary, and habitat protection that would influence future conservation efforts.
- Forest and Stream (initial publication in 1873) becomes the nation’s leading sportsman’s magazine and an advocate for conservation
- Many non-government conservation organizations would be established including the American Ornithologist Union (1883), Audubon (1886), the Boone and Crockett Club (1887), and the Sierra Club (1892)
- George “Bird” Grinnell and William Temple Hornaday were calling attention to the near extermination of bison; Joseph A. Allen and others in the ornithological community denounced the destruction of birds (see this 1886 supplement to Science (pages 191 -205) on the Destruction of our Native Birds
<https://babel.hathitrust.org/cgi/pt?id=osu.32435078675105&view=1up&seq=219&q1=destruction>
- Passenger pigeons, once numbering in the billions disappeared from America’s landscape

- President Benjamin Harrison issued Proclamations to protect a forest reserve in Wyoming (1891) and the Afognak Forest and Fish Culture Reserve in Alaska (1892)
- Various authors and artists were noting wildlife declines and pointing out the need to conserve

Collectively, these developments were the modest beginnings of a new awareness that America's fish and wildlife resources were not limitless but needed conservation or management. They signaled a transition from a mindset of exploitation to one of conservation (wise use) and sportsmanship. This shift in thinking was well expressed in the inaugural edition of Forest and Stream magazine:

“The object of this journal will be to studiously promote a healthful interest. in outdoor recreation, and to cultivate a refined taste for natural objects. We especially desire to make the Forest And Stream the recognized medium of communication between amateurs and professional sportsmen. All of us have something to impart, which, if made available to each other, will in time render us proficient in all those several branches of physical culture which are absolutely essential! to our manhood and well-being, both as individual men and as a nation. A practical knowledge of natural history must of necessity underlie all attainments which combine to make a thorough sportsman. It is not sufficient that a man should be able to knock over his birds dexterously right and left, or cast an inimitable fly. He must learn by study and experience the haunts and habits of the game or fish he seeks. If he depend altogether upon his dog's nose, or his henchmen, he will someday have to retire from the field in mortification and disgrace. Therefore, it is that we shall study to give practical instruction in the most attractive departments of natural history. We shall not forget the technicalities of the craft either, but take pleasure in designating the best localities for hunting and fishing, outfits, implements, remedies, routes, distances, breeds of dogs, etc. Each number will contain a paper descriptive of a particular game animal, bird, or fish, with some instruction as to its habits, haunts and mode of capture, and the period when it is in season. We have arranged to receive regular weekly reports of the fishing and shooting in various parts of the country.” - Forest and Stream; 1873, Vol 1, #1, page 8

Although these developments boded well for the initiation of additional fish and wildlife conservation measures, the federal role in this remained vague. It was given only limited attention at this time but the stage was being set for conservation efforts including establishment of the National Wildlife Refuge System in the coming years.



Paul Kroegel and visitors examine brown pelican chicks at Pelican Island in Florida, considered to be the first unit of today's National Wildlife Refuge System.

Table 1. Timeline for ERA #1: Setting the stage for protected lands (1850-1900)

Overview: During this half century era leading up to establishment of the first national wildlife refuge in 1903, the U.S. population grew from 23 (85% rural) to 76 (60% rural) million. Although it was a time of great slaughter of wildlife, the later part of the era was a time of awakening to the fact that our nation's fish and wildlife resources are not limitless and sets the stage for initiation of fish and wildlife conservation and management roles for the federal government.

1848	Hunting ethics: Publication of Frank Forster's (Henry William Herbert's pen name) "Field Sports of the United States" and Henry William Herbert's "Field Sports of the British Provinces of North America". These 2 volumes among other things defined "game" and were a major influence for the next half century on hunting ethics, regulation, and policy. (in Bill Reffalt's "Historical Chronology of the National Wildlife Refuge System" see entry for 1994)
1851	Thoreau: Henry David Thoreau addressed the Concord (MA) Lyceum declaring that "in Wildness is the preservation of the World." This address was published posthumously as the essay "Walking" http://memory.loc.gov/cgi-bin/query/r?ammem/consrvbib:@FIELD(NUMBER(vr01)) . In 1854 Thoreau's "Walden" Walden, and On The Duty Of Civil Disobedience by Henry David Thoreau was published.
1852	Great auk extinct: Last report of a possible great auk off Grand Banks, Newfoundland; the last confirmed specimens were killed in Iceland in 1844; species is extinct. North America's only flightless bird, it was once so abundant on the North Atlantic coast that European fishing fleets could depend on them to supply enough fresh meat and eggs to provision their return trip. Learn more at Great auk - Wikipedia
1860	Musk ox extinct in U.S.: Musk ox extirpated from Alaska between 1850 and 1860; extinct in the U.S. (Reported in Bill Reffalt's "Historical Chronology of the National Wildlife Refuge System" see entry for 1994) Learn more at Muskox - Wikipedia
1861	Civil war: U.S. civil war begins and would continue until 1865.
1862	Homesteading: The Homestead Act encouraged Western migration by providing settlers 160 acres of public land. In exchange, they paid a small filing fee and were required to complete five years of continuous residence before receiving ownership of the land. From enactment until its repeal in 1976 it transferred about 270 million acres of land (14% of the nation's land in the contiguous 48 states) from federal government to private ownership.
1864	National nature preserves advocated: Posthumous publication (he died in 1862 at age 44) of Henry David Thoreau's "The Maine Woods", in which he calls for the establishment of "national preserves" of virgin forest, "not for idle sport or food, but for inspiration and our own true re-creation."
1864	"Man and Nature": George Perkins Marsh publishes 'Man and Nature; or, Physical Geography as Modified by Human Action' http://memory.loc.gov/cgi-bin/query/r?ammem/consrvbib:@FIELD(NUMBER(vg07)) , the first systematic analysis of humanity's destructive impact on the natural environment and a work which becomes (in historian Lewis Mumford's words) "the fountain-head of the conservation movement."
1867	Alaska purchase: The U.S. purchases Alaska from Russia for \$7.2 million (about 2 cents per acre).
1868	First federal wildlife regulation: Congress prohibits killing fur seals and other fur bearing animals in Alaska and its territorial waters. This measure was to protect the commercial value of seal skins so arguably this was a measure to protect commerce and not necessarily a recognition of a federal role in wildlife conservation.
1869	Railroads: Transcontinental railroad completed. Railroads played a large role in the development of the U.S. from the industrial revolution in the Northeast (1810–1850) to the settlement of the West (1850–1890). By 1880 the nation had 17,800 freight locomotives and 22,200 passenger locomotives. The railroad industry was the nation's largest employer outside of the agricultural sector. American railways impacted rapid industrial growth, opened hundreds of millions of acres of farmland ready for mechanization, lowered

	costs for food and all goods, and provided a huge national sales market. It was also a major factor contributing to the near extirpation of the American bison.
1869	Pribilof Islands reservation: Congress designates the Pribilof Islands in Alaska as a national reservation to protect fur seals. Authority for managing the reservation including leasing the right to kill fur seals and take their pelts is placed in the Department of Treasury. This is believed to be the first recognition by Congress of a federal role in wildlife conservation and management.
1873	Forest and Stream magazine: Initial publication of Forest and Stream magazine (weekly) in 1873 by Charles Hallock followed by the leadership of George Bird Grinnell, senior editor and publisher from 1880 to 1911--was the major American sportsmen's magazine by the turn of the century and a forum for conservation advocacy https://archive.org/details/pub_forest-and-stream-a-journal-of-outdoor-life?&sort=date . Other popular sportsman's journals of the time included American Sportsman, appearing in 1871, Field and Stream (1874) and American Angler (1881). Each advocated shifting from a philosophy of killing in numbers and market gunning to one of sportsmanship that emphasized conservation and the love of fair play.
1875	Labrador duck extinct: Last Labrador duck shot on Long Island, NY. Last reported sighting is off Elmira, New York in 1878; species extinct. Learn more at Labrador duck - Wikipedia
1876	Call for action on declining wildlife: Dr. J. A. Allen describes severe declines in birds and mammals and calls for establishment of societies to protect birds; he also suggests withdrawal of large "game preserves" in the West to permit recovery of large mammals. (Reported in Bill Reffalt's "Historical Chronology of the National Wildlife Refuge System" see entry for 1994). Allen and his cohorts especially called attention to the destruction of native birds for the millinery trade. Allen was the first president of the American Ornithologists' Union, the first curator of birds and mammals at the American Museum of Natural History, and the first head of that museum's Department of Ornithology. Learn more at Joel Asaph Allen
1878	Last reported great flock of passenger pigeons: An estimated 3 to 5 billion passenger pigeons are estimated to have been in North America when European settlers first arrived. By the mid-1800's, numbers were declining rapidly. 1878 saw the last report of a great nesting of passenger pigeons (Petoskey, Michigan) and last great slaughter. An estimated 1.5 million birds were killed at Petoskey and shipped to markets over a 5-month period of time. Learn more at The Passenger Pigeon
1883	American Ornithologist Union established: The American Ornithologists' Union (AOU) was founded by William Brewster, Elliott Coues, and Joel Allen out of concern for bird conservation and interest in developing the field of ornithology in North America. They were among the first to point out severe declines in our nation's bird life (see this 1886 supplement to the journal Science (pages 191-2-5) on "The Destruction of Our Native Birds" https://books.googleusercontent.com/books/content?req=AKW5QafJik537bEJzXVaeaE6UtdRWFk9Or9O275AHrzu3DC9M6Vayqiy_5L8NRZpAfraCJyuM41qjFABAs83pS2JOBqimlLy04_jKxYShtDdhfdd38HeUhBn36S7q2-vWtUQWZXLPAW8nJq3xE5-XghKHCySVBehbiaMctgsMX11tb0fzS-hIQDw_AdXK-_1kjJZNamcf0rf7WdLkXgPV_ySgamiOwLbmUeLAPDanuaE7PQ4K_2FILc). Early AOU efforts focused on bird study and conservation and in time would lead to the establishment of Pelican Island (the first unit of what would become the National Wildlife Refuge System), and the formation of the National Audubon Society and the Biological Survey (the forerunner of the U.S. Fish and Wildlife Service). To learn more about the AOU, now the American Ornithological Society, see https://americanornithology.org/about/history/
1885	Division of Economic Ornithology established: At the request of the AOU and with other support, the Division of Economic Ornithology is established in the Department of Agriculture with an appropriation of \$5,000. In 1886 it was upgraded to the Division of Economic Ornithology and Mammalogy and appropriations were increased to \$10,000. With Clinton Hart Merriam as its first chief, much of the Division's early work was to define the geographical distribution of animals and plants throughout the country and study the positive effects of birds in controlling agricultural pests. The Division later expands and is renamed the Bureau of Biological Survey, a forerunner of the Fish and Wildlife Service.
1886	Audubon Society established: The Audubon Society, dedicated to the protection of birds and their natural habitats, is founded by George Grinnell, publisher of Forest and Stream magazine. Audubon

	<p>societies were formed largely in response to recognition of the wanton destruction of birds for use of feathers and bird parts in the fashion industry (see https://scholarship.tricolib.brynmawr.edu/bitstream/handle/10066/675/2002BirdsallA.pdf?sequence=7 and https://www.jstor.org/stable/pdf/24450931.pdf?refreqid=fastly-default%3A90207641d1d34e8cf1feedd1c34353a4&ab_segments=0%2Fbasic_search_gsv2%2Fcontrol&origin=&initiator=search-results&acceptTC=1).</p> <p>Grinnell's original group soon folds, but local and state chapters take up the mantle and reconstitute the National Audubon Society in 1905. Learn more at https://www.audubon.org/about/history-audubon-and-waterbird-conservation and https://babel.hathitrust.org/cgi/pt?id=hvd.32044103128112&view=1up&seq=1</p>
1887	<p>Boone and Crockett Club established: The Boone and Crockett Club, an elite group of outdoorsmen, is founded by George Grinnell, Teddy Roosevelt, and others to promote ethical hunting laws and wildlife conservation. Among their achievements was the defense of Yellowstone Park against railroad and mining interests; at that time, the park was still open for commercial exploitation. In 1904 they published "American big game in its haunts; the book of the Boone and Crockett Club". Editor: George Bird Grinnell https://archive.org/details/americanbiggamei00grin/page/n7/mode/2up. They actively advocated for the creation of big game reservations, a number of which would ultimately become national wildlife refuges. Learn more at https://www.boone-crockett.org/history-boone-and-crockett-club. The Boone and Crockett Club's emphasis on hunting ethics and habitat protection for wildlife would heavily influence the conservation efforts of Teddy Roosevelt when he became President.</p>
1889	<p>Bison decimated: William Temple Hornaday publishes "The Extermination of the American Bison" http://memory.loc.gov/cgi-bin/query/r?ammem/consrv:@field(DOCID+@lit(amrvvr02)):@@@REF\$. This report to the Secretary of the Smithsonian, originally printed in the Smithsonian's annual report for 1887, severely criticized the near-extirmination of bison, and advocated protection of what remained of the herds. There were an estimated 30 to 60 million bison in North America prior to European settlement. A massive slaughter like never before seen occurred in the 1860s to 1880s. By 1889, only an estimated 1,000 bison remained. George Bird Grinnell also published an article in 1892 describing the disappearance of the American buffalo. https://archive.org/details/lastofbuffalo00grin/page/n23/mode/2up</p>
1891	<p>Forest reserves established: By act of Congress, the President was given power to establish forest reserves from the public domain (26 Stat. 1103). The provision was attached as a rider to a bill revising the land laws and the Interior Department was charged with administering these reserves. On March 30, President Harrison created the first reserve, the Yellowstone Timberland Reserve, an area of 1,239,040 acres in Wyoming. These reserved lands are now part of the National Forest System in the Shoshone and Teton National Forests. Before his term expired, President Harrison set aside forest reserves totaling 13 million acres. No plan of operation was passed by Congress and the reserves were simply closed areas.</p>
1892	<p>Sierra Club established: Naturalist and writer John Muir co-founds (with Robert Underwood Johnson) and becomes president of the Sierra Club, which is dedicated to wilderness preservation and outdoor recreation. Learn more at https://www.sierraclub.org/library/history-archives</p>
1892	<p>Afognak reserve: President Benjamin Harrison issues a Proclamation http://memory.loc.gov/cgi-bin/query/r?ammem/consrvbib:@FIELD(NUMBER(v1153)) setting aside a tract of land in Alaska as a forest and fish culture reservation (the Afognak Forest and Fish-Culture Reserve), thus creating what is arguably in effect, if not in name, the first national wildlife refuge. In 1908, it was combined with Chugach National Forest and the name was discontinued.</p>
1893	<p>Hawaiian rail extinct: The last confirmed sighting was in 1884 and another possible sighting was reported in 1893; species extinct. Learn more at Hawaiian rail</p>
1895	<p>NY Zoological Society established: The New York Zoological Society, fostered by the Boone and Crockett Club (Reported in Bill Reffalt's "Historical Chronology of the National Wildlife Refuge System" see entry for 1994), is incorporated. Among their activities, they would play an important role in the conservation and restoration of buffalo in the U.S. including providing stock to start herds at national wildlife refuges. Learn more at https://blog.biodiversitylibrary.org/2017/01/the-new-york-zoological-society.html</p>

1895	<p>Fuertes art: The first exhibit of paintings of famed bird artist Louis Agassiz Fuertes Louis Agassiz Fuertes - US Fish and Wildlife Service — Google Arts & Culture. Over the course of his life which ended in a 1927 automobile accident, he produced thousands of works. Of his “most important works”, Frank Chapman compiled “at least 400 monochrome illustrations (about half in Coues' Key to North American Birds) and at least 700 color plates, with the largest number (250) appearing in National Geographic's Book of Birds (1918), and a lesser number (106) in E. H. Eaton's Birds of New York (1910-1914). There were also 68 plates in E. H. Forbush's three-volume Birds of Massachusetts (1925-1929), which are generally considered to be Fuertes' best illustrations, given the limitations of crowding several species on a single plate. A total of 35 color plates and 35 halftones appeared in The Bird Life of Texas by H. C. Oberholser (1974), nearly 50 years after Fuertes' death.” A portion of Fuertes artwork as well as work by other noted bird painters is owned by the FWS and is on loan to the Academy of Natural Sciences in Philadelphia.</p>
1896	<p>Biological Survey established: In the appropriations bill for the Department of Agriculture, Congress renames the Division of Economic Ornithology and Mammalogy to establish the Division of Biological Survey within the Department. This lengthy appropriations bill contains a paragraph entitled "Division of Biological Survey" (p. 100), that creates the Division by designating titles and salaries for a staff of 7 http://memory.loc.gov/cgi-bin/query/r?ammem/consrvbib:@FIELD(NUMBER(v1008)). It became the Bureau of Biological Survey in 1905.</p>
1897	<p>"Citizen Bird" published: “Citizen bird: scenes from bird-life in plain English for beginners”, by Mabel Osgood Wright and Elliott Coues, with 111 illustrations by Louis Agassiz Fuertes was published https://www.gutenberg.org/ebooks/11896. This classic and widely influential work brings together the talents of the greatest American ornithologist of his generation (Coues), a pioneering nature writer/editor/ornithologist (Wright), and a young artist whose contribution to the American tradition of bird illustration proved to be second only to Audubon (Fuertes - this book features the first substantial body of his work). Directed at the general public, especially children, and written in an entertaining style, the work imparts solid scientific knowledge while inculcating conservation values. It exemplifies the extensive literature of popular yet scientifically-grounded ornithology which nurtured the national passion for birds in this era, thereby fostering some of conservationism's most vital and widespread grass roots.</p>
1899	<p>Alaska expedition: The Harriman Alaska Expedition explores coastal Alaska by boat throughout the summer. The Expedition is undertaken by distinguished citizens, many of whom are actively involved in conservationism, including numerous scientists under the direction of C. Hart Merriam (Chief, U.S. Biological Survey), John Muir, John Burroughs, photographer Edward Curtis, forester Bernhard Fernow, George Bird Grinnell, artists Frederick Dellenbaugh and Louis Agassiz Fuertes, and railroad magnate Edward H. Harriman and members of his family (Harriman funded the expedition). The Expedition produced a remarkable private Album of "Chronicles and Souvenirs" that captured much of the spirit and outlook that animated the conservation movement in this era. The major results of the Expedition's scientific and ethnological investigations filled fifteen volumes published between 1901 and 1914. The Harriman Expedition visited and extensively studied wildlife and habitat for the first time in many areas that would become national wildlife refuges 80 years later ::: Harriman Alaska Expedition of 1899 :::</p>

Era #2: THE EARLY YEARS, TEDDY ROOSEVELT LEADS THE CHARGE (1903-1913)

This era marks the first decade of what would later become the National Wildlife Refuge System. The U.S. population grew from 80 (58% rural) to 97 (52% rural) million in this decade. In 1900, the average family had an annual income of \$3,000 (in today's dollars). The family had no indoor plumbing, no phone, and no car. About half of American children lived in poverty. Most teens did not attend school; instead, they labored in factories or fields.

Continued immigration, increasing industrialization, development of the internal combustion engine, growing mechanization of agriculture, building of roads, invention of the assembly line, and similar such developments placed increasing demands on the land. Fish and wildlife habitats decreased dramatically. Bird feathers were popular in the fashion industry and market hunting for birds was taking a heavy toll on their numbers. The American landscape was a mosaic of heavily developed areas intermixed with wild lands but the area of remaining wild lands was shrinking dramatically. The growing human population was dramatically reducing wildlife habitats. Forests, wetlands, and prairies were rapidly disappearing and converted to agriculture and other developments. Market hunting and illegal take of wildlife was still common even though laws were being put in place to provide for conservation of wildlife. Collectively, these stressors were resulting in precipitous declines in wildlife.

“Wild beasts and birds are by right not the property merely of the people who are alive today, but the property of unknown generations, whose belongings we have no right to squander.” - Theodore Roosevelt

At this time, America was realizing that the era of “game abundance” was over and that conservation actions would be needed. Passage of the Lacey Act in 1900 and the Refuge Trespass Act in 1906 showed that Congress recognized a need to act but given that no field agents were put in place to enforce the laws made them essentially paper gestures. The Lacey Act forbade interstate transport of wildlife taken in violation of state laws. This was a major step in the recognition that the federal government played a lead role in conserving wildlife.

Theodore Roosevelt (President 1901-1909), known as the conservation president, was a visionary and an activist who did much to launch conservation actions in the country. He cared deeply for the natural world and worked to conserve it for the benefit of future generations. In 1903, at the urging of private citizens, he established three-acre Pelican Island in Florida as the first unit of what is now the National Wildlife Refuge System. In 1902, Paul Kroegel became the first warden at Pelican Island. He was a Florida Audubon Society warden paid \$50 by the American Ornithologists' Union to protect Pelican Island during the bird nesting season. On April 1, 1903, he was designated by the Secretary of Agriculture as warden in charge of Pelican Island and provided with a salary of \$1 per month. Kroegel is reported to be only the second federal warden appointed in this type of capacity, the first being Charles J. “Buffalo” Jones. Jones was Commissioned by the Secretary of the Interior as Game Warden for Yellowstone National Park on July 8, 1902 with an annual salary of \$1,800 per year.



Colonial nesting waterbirds such as the brown pelican pictured here sitting on a refuge boundary sign were prominent in the bird reservations established by Teddy Roosevelt.

Following the modest beginning with Pelican Island, many other islands and parcels of land and water were quickly dedicated to protecting colonial nesting birds such as herons, egrets, and pelicans. By the end of his administration in 1909, Roosevelt issued Executive Orders establishing 52 wildlife reservations in 17 states and three territories. Congress also responded to the public mood recognized by Roosevelt and legislatively established 3 big game reservations; the Wichita Mountains in 1905 (originally established as a forest reserve in 1901), the National Bison Range in 1908, and the National Elk Reservation in 1912.

In these early years of establishing wildlife reservations, the federal government largely set aside lands through protective designations but then took little action to protect and manage them. Jurisdiction over these reservations was given to the Division of Biological Survey in the Department of Agriculture (the early forerunner of the Fish and Wildlife Service). Appropriations in 1896 provided for a staff of 7 and staffing did not expand much in the years that followed. Originally established to focus primarily on determining the distribution of birds in North America and assessing their interrelationships with agriculture, the Biological Survey was given added responsibilities of controlling interstate commerce in wildlife, managing Alaska wildlife, regulating importation of bird eggs, and controlling “noxious” birds and mammals. Thus, the arrival of protected lands added a land management responsibility to a small and already impossibly overtasked organization.

A sense of the degree of competing priorities within the Biological Survey is illustrated in the 1912 annual report of the Chief of the Biological Survey. Of 35 topics discussed in the report, only 3 pertained to wildlife reservations. Whenever meager staffing did become available to help protect wildlife reservations, first priority was given to hiring wardens who would work to preclude illegal taking of wildlife and other abuses of the land. Congressional hearings on the FY 1913 budget for the Department of Agriculture’s Bureau of Biological Survey, reflected that there were 15 to 20 wardens in place to patrol wildlife reservations; some were full time and others seasonal.

Audubon societies stepped forward to help fill the void in lack of law enforcement on protected lands by hiring Audubon Wardens. By 1904, 34 Audubon wardens were employed in 10 states.

In 1906, Congress passed the Refuge Trespass Act which made it a misdemeanor crime to disturb birds or their eggs on Federal wildlife reservations.

In 1909, Congress appropriated funds to build fences to protect the bison herd at the National Bison Range in Montana. This is believed to be the first funding provided by Congress to improve wildlife reservations managed by the Biological Survey. An earlier appropriation to manage wildlife on a federal reservation was made in 1907 when Congress provided \$15,000 to erect a fence on what is now Wichita Mountains NWR; in 1907 however, Wichita was under the management of the U.S. Forest Service.



The desire to protect wild landscapes and to restore bison and other large game animals encouraged establishment of federal game reservations such as the Fort Niobrara NWR with sparring elk shown in the photo to the left.

By 1913, the end of the first decade of what would become the National Wildlife Refuge System, this nascent collection of conservation lands included 65 units in 15 states and territories. They encompassed about 3 million acres in Alaska and about 400,000 acres in the lower 48. In 1913, Congress passed the Weeks-McLean Act (eventually superseded by the Migratory Bird Treaty Act of 1918). It declared all migratory and insectivorous birds to be within the custody and protection of the Federal government. The nation was now beginning to recognize the need to conserve its wilder lands and wildlife inhabitants, but still had much to learn about how to proceed.

Table 2. Timeline for ERA #2: The early years, Teddy Roosevelt leads the charge (1903-1913)

Overview: During this first decade of what would become the Refuge System, the U.S. population grew from 80 (58% rural) to 97 (52% rural) million. Teddy Roosevelt established the first refuge in 1903 and added 52 other areas during his Presidency that would become part of the future Refuge System. Congress established several game reservations to protect big game mammals. Most of these areas were managed by the Bureau of Biological Survey within the Agriculture Department. Little provision was made for managing these lands and Audubon wardens provided the early protection of some of these wildlife reservations; by 1904, 34 Audubon wardens were protecting refuges in 10 states. Transition to wardens employed by the Biological Survey came slowly with an estimated 15 to 20 in place by 1915, some of which were part time. By the end of this era there were 65 bird and game reservations encompassing 3.4 million acres (3 million acres in Alaska).

1900	<p>Lacey Act enacted: Congress passed the first comprehensive Federal legislation designed to protect wildlife: the Lacey Act, so called in recognition of its chief sponsor, Rep. John F. Lacey https://babel.hathitrust.org/cgi/pt?id=hvd.32044106196322&view=1up&seq=3&skin=2021. It outlawed the interstate shipment of any wild animals or birds killed in violation of state laws. Enforcement of the Act was delegated to the Division of Biological Survey within the Department of Agriculture. (see entry under 1896 when the Division of Biological Survey was established and consisted of 7 individuals) Although enforcement of the law was very challenging in the early years, the Lacey Act and its subsequent amendments have over time proven to be immensely important in combatting illegal trade in wildlife https://www.animallaw.info/article/lacey-act-americas-premier-weapon-fight-against-unlawful-wildlife-trafficking (additional article available in JSTOR: "The Lacey Act: America's First Nationwide Wildlife Statute" by Theodore Whaley Cart in Forest History Newsletter, Oct., 1973, Vol. 17, No. 3, pp. 4-13)</p>
1901	<p>Teddy Roosevelt elected president: Theodore Roosevelt was elected and became the "conservation president." During his administration (1901-1909), more than 225 million acres of land became part of the U.S. Forest Service, and 53 wildlife reserves and 150 national forests were created. For more on TR's conservation legacy, see https://americanhistory.si.edu/elephants-and-us/conservation-our-responsibility-0#:~:text=Theodore%20Roosevelt%20popularized%20the%20idea%20that%20conservation%20was,proper%20development%2C%20use%2C%20and%20protection%20of%20natural%20resources, https://www.youtube.com/watch?v=ICxf9eYVWiaM, and https://www.youtube.com/watch?v=x0BS1OEIIYo The 2009 book by Douglas Brinkley, "The Wilderness Warrior: Theodore Roosevelt and the Crusade for America" describes many of Roosevelt's visionary conservation efforts and is a recommended read for any student of the Refuge System.</p>
1901	<p>Audubon wardens: In 1901, state-level Audubon groups joined together in a loose national organization. They helped establish the first National Wildlife Refuge in the U.S. in 1903 (Pelican Island, in Florida) and facilitated the hiring of wardens to protect water bird breeding areas in several states. By 1904, the various Audubon organizations had 34 wardens employed in 10 states. By 1910, there would be 100 Audubon wardens in place. Audubon organizations were also active in encouraging legislative protection for birds and in public information and education efforts. For more on the early activities of Audubon Societies, see T. Gilbert Pearson's autobiography "Adventures in Bird Protection" https://babel.hathitrust.org/cgi/pt?id=mdp.39015006891173&view=1up&seq=210 and Oliver H. Orr's book "T. Gilbert Pearson and the Founding of the Audubon Movement".</p>
1901	<p>Wichita Forest Reserve established: Wichita Forest Reserve, OK, set aside by Congress as a forest reserve and managed by the Department of the Interior.</p>
1902	<p>Alaska Game Act enacted: In one of a series of acts designed to regulate harvest of wildlife in the territory of Alaska, Congress passes "An Act For the protection of game in Alaska, and for other purposes". Known as the Alaska Game Act, it protected certain game animals in Alaska; provisions were strengthened by amendments in 1908.</p>

1902	<p>Paul Kroegel hired as warden: William Dutcher, Chair of the Audubon National Committee, hired Paul Kroegel to protect birds of Pelican Island and paid him \$50 to protect birds during the nesting season. Kroegel was officially appointed as warden by the Secretary of Agriculture on April 1, 1903 and was given a salary of \$1 per month. He lived near Pelican Island and was a farmer and boat builder. His primary duty as warden was to warn off trespassers and vandals. Warden Kroegel defended his pelicans with a badge, a double-barreled shotgun, and a small boat and served in this capacity until 1926. Learn more about Kroegel at http://www.firstrefuge.org/one-person-can-make-a-difference. Kroegel is reported to be only the second federal warden appointed in this type of capacity, the first being Charles J. "Buffalo" Jones. Jones was Commissioned by the Secretary of the Interior as Game Warden for Yellowstone National Park on July 8, 1902 with an annual salary of \$1,800 per year.</p>
1903	<p>Pelican Island reservation: At the urging of a number of citizen conservationists, most prominently, members of the American Ornithologists Union, President Roosevelt orders the creation of Pelican Island in Florida —the first national wildlife refuge. Administration was assigned to the Division of Biological Survey in the Department of Agriculture. Paul Kroegel is appointed Warden-in-Charge and the AOU agrees to pay his salary. Pelican Island was the first of 52 wildlife sanctuaries Roosevelt created, Pelican Island sets the precedent for today's National Wildlife Refuge System. For background on Pelican Island NWR see https://www.fws.gov/media/first-refuge-born and https://erenow.net/biographies/the-wilderness-warrior-theodore-roosevelt-and-the-crusade-for-america/1.php A virtual exhibit may be viewed at https://trainingcenter.fws.gov/history/VirtualExhibits/PelicanIsland/index.html</p>
1903	<p>Palmer, 1st Chief of wildlife reservations: T. S. Palmer was the 1st national level "Chief" given direct responsibility for oversight of wildlife reservations which in time would become today's National Wildlife Refuge System. Palmer was born in California in 1868 and studied at the University of California. In 1889 he joined the Division of Economic Ornithology and Mammalogy in the Department of Agriculture. In 1896, Congress changed the name of the Division to the Division of Biological Survey, gave a budget of \$10,000 and authorized a staff of 7. The Division had 3 sections and from 1900 to 1916, T. S. Palmer was Assistant Chief of the Biological Survey and was also the head of the Section of Game Protection which was responsible for "matters relating to game preservation and protection and the importation of foreign birds and animals". This section was given responsibility for administration of the first refuge, known then as the Pelican Island Reservation. By 1905, the annual report of the Biological Survey showed Pelican Island, as well as Breton Island Reservation, Stump Lake Reservation, and Wichita Game Refuge. The Division of Biological Survey became the Bureau of Biological Survey in 1905. Duties remained similar for Dr. Palmer who continued to lead the Game Protection Section. Also, as Assistant Chief, Palmer often served as the Chief of the Division/Bureau of Biological Survey for long time periods while C. Hart Merriam was afield doing research and survey work. Palmer prepared and transmitted the Biological Survey's annual report for 4 years (1898-1901). Palmer had limited resources available to him along with wide ranging responsibilities. He focused efforts for wild life reservations on providing warden services to reduce poaching, market hunting, or other illegal activities. Among his publications, he authored "Federal Game Protection—A Five Years' Retrospect" in 1905 https://babel.hathitrust.org/cgi/pt?id=hvd.32044106196322&view=1up&seq=3&skin=2021. In 1912, he authored Biological Survey Circular 87 "National Reservations for the Protection of Wild Life" https://archive.org/details/CAT31414456 in which he described reservations set aside by the federal government (in five different departments) to either directly or indirectly protect wild life. In large part due to land protection efforts championed by President Teddy Roosevelt, growth in the number of wildlife reservations occurred throughout Palmer's tenure and by June 30, 1916 there were 72 reservations in place (67 bird reservations and 5 big game preserves). C. Hart Merriam (1903-1909) and Herbert W. Henshaw (1910-1916) were Biological Survey Chiefs during T.S. Palmer's tenure as wildlife reservations supervisor (among other duties most related to law enforcement). The later part of Palmer's career until he retired in 1933 focused on wildlife law enforcement and migratory bird protection. Palmer served the Biological Survey 44 years.</p>
1904	<p>Sully's Hill National Park established: Congress establishes Sully's Hill National Park in North Dakota. It was designated by Congress as a big game preserve in 1914 and later transferred to the Biological Survey in 1931 to be further set aside as a refuge and breeding grounds for migratory birds and</p>

	wildlife. Today it is White Horse Hill National Game Preserve, a 1,674-acre national wildlife refuge on the south shores of Devils Lake https://www.fws.gov/refuge/white-horse-hill-national-game-preserve
1904	Big game championed by Roosevelt: In his Annual Message to Congress (his fourth), President Roosevelt urges Congress to authorize the setting aside of certain forest reserves and public lands as game refuges for the preservation of the "bison, wapiti, and other large beasts once so abundant in our woods and mountains and on our great plains, and now tending toward extinction."
1904	Marines to Midway to protect birds: President Roosevelt issues an order sending a detachment of 20 marines to Midway Atoll to prevent the taking of birds and their eggs by Japanese nationals.
1905	Forest Service: In accordance with one of the Forest Congress's principal recommendations, Gifford Pinchot succeeds in having the oversight of national forest reserves transferred from the Department of Interior (General Land Office) to his own jurisdiction, the Bureau of Forestry (formerly known as the Division of Forestry in the Department of Agriculture, and transforms the Bureau into the Forest Service. This is accomplished by "An Act Providing for the transfer of forest reserves from the Department of Interior to the Department of Agriculture", known as the Transfer Act of 1905. This change also symbolizes: 1) a shift of emphasis from preservation to scientific forestry focusing predominantly on commodity production, and 2) Pinchot's dominance in public conservation policy.
1905	Biological Survey becomes a bureau: The former Agriculture Department Division (established in 1885 as the 3-person Division of Economic Ornithology and Mammalogy, then renamed in 1896 to the 7-person Division of Biological Survey) becomes the Bureau of Biological Survey. The Bureau would have numerous responsibilities, few people and a meager budget. In time it would become the Fish and Wildlife Service in the Department of the Interior (1940). Activities of the Biological Survey are described in annual reports from the Chief of the Biological Survey completed between 1902 and 1939 https://www.google.com/books/edition/Report_of_the_Chief_of_the_Bureau_of_Bio/zNZLAQAAMAAJ?hl=en
1905	Warden Guy Bradley killed: Audubon Society game warden, Guy Bradley, is murdered by a plume hunter in Florida's Everglades. Tasked with protecting the area's wading birds from hunters, he patrolled the area stretching from Florida's west coast, through the Everglades, to Key West, single-handedly enforcing the ban on bird hunting. Bradley was shot and killed in the line of duty, after confronting a man and his two sons who were hunting egrets in the Everglades. His much-publicized death at the age of 35 galvanized conservationists, and served as inspiration for future legislation to protect Florida's bird populations The Most Dangerous Job: The Murder of America's First Bird Warden https://www.youtube.com/watch?v=ErZhNGjF9U https://en.wikipedia.org/wiki/Guy_Bradley Several national awards and places have been named in his honor. Additional information is in Stuart McIver's book "Death in the Everglades: The Murder of Guy Bradley, America's First Martyr to Environmentalism".
1905	First federal big game reserve established: Wichita Mountains in Oklahoma, established in 1901 as a forest reserve, was changed to a big game reserve and management responsibility was transferred from the Interior Department to the U.S. Forest Service. Management authority was transferred to the U.S. Biological Survey in 1936 and it has been part of the Refuge System since that time https://www.fws.gov/refuge/Wichita_Mountains/ . A detailed history of the establishment of the Wichita Mountains National Wildlife Refuge is provided in the 1973 Master's thesis by Jack Haley https://shareok.org/handle/11244/335503
1905	American Bison Society established: The American Bison Society is organized and William T. Hornaday, Director of the New York Zoological Society is elected as its first President. https://en.wikipedia.org/wiki/American_Bison_Society The mission of the society is the preservation and increase of the American bison. For more on the history of the Society see https://allaboutbison.com/bison-in-history/american-bison-society/
1906	Refuge Trespass Act enacted: Congress passes the Game and Bird Preserves Protection Act (Refuge Trespass Act) to provide the first regulatory authority for managing uses on reservations administered by the Bureau of Biological Survey. The Act made it a misdemeanor crime to disturb birds or

	<p>their eggs on Federal wildlife reservations. It also provided Congressional approval for previous Executive Order reservations.</p>
1906	<p>Antiquities Act enacted: The Antiquities Act, which aims to preserve ancient Indian artifacts under a new rubric of protected "national monuments," is passed by Congress and signed by President Roosevelt. The Act became a watershed in wilderness preservation thanks to the creativity of Roosevelt, who used it to proclaim millions of acres—including the Grand Canyon, the Petrified Forest, and Katmai—"national monuments." Today there are 9 National Monuments in the Refuge System List of national monuments of the United States - Wikipedia</p>
1907	<p>Teddy Roosevelt promotes conservation: In his Seventh Annual Message, President Roosevelt makes the case for utilitarian conservationism especially forcefully, asserting that "the conservation of our natural resources and their proper use constitute the fundamental problem which underlies almost every other problem of our National life," and that his administration has been trying "to substitute a planned and orderly development of our resources in place of a haphazard striving for immediate profit." Also, following establishment of Pelican Island in 1903 as the first federal bird reservation, between 1904 and 1907 Roosevelt established 14 more wildlife reservations. Most were small islands important to nesting colonies of waterbirds. For a video showing birds of 2 early wildlife reserves (now Breton NWR and Delta NWR both in Louisiana) see https://www.youtube.com/watch?v=27NTHJRZcec&list=PL7E8264DA432377C9&index=13</p>
1907	<p>Bison reintroduced to Wichita Mountains: Under the leadership of its Director, William T. Hornaday, the New York Zoological Society ships 15 (7 bulls and 8 cows) of its healthiest bison to the Wichita Forest and Game Preserve in Oklahoma (became Wichita Mountains NWR in 1935). This was an important milestone in the nation's efforts to save bison from extinction. Congress appropriated \$15,000 to erect a fence for the herd on the preserve. This is believed to be the first appropriation of funds to manage wildlife on a federal reservation. no.36 - The Wichita national forest and game preserve. Wichita Mountains NWR is a premier place to understand the science of species reintroductions. An assortment of wildlife has been brought back to the Wichitas to give them a second chance.</p>
1907	<p>First west coast bird reservation: As a result of intensive lobbying from noted wildlife photographer William L. Finley, President Theodore Roosevelt establishes Three Arch Rocks, Oregon, as the first Federal bird reservation on the west coast. The following year, the President established the Klamath and Malheur Bird Reservations in Oregon after seeing Finley's splendid photography of the area. Impetus for establishing the Malheur reservation included Finley's reports of large numbers of nesting birds being taken in the area by plume hunters https://www.theatlantic.com/magazine/toc/1910/09/. Klamath Basin refuges are among the most biologically productive areas in the Refuge System; they provide habitat for an estimated 80% of migrating waterfowl in the Pacific Flyway.</p>
1907	<p>American Birds published: "American Birds, Studied and Photographed from Life" by William L. Finley is published. Finley was an ardent conservation proponent who used photography to promote preservation of wildlife lands. https://www.youtube.com/watch?v=GCF_wzaTVWE His classic book may be accessed at https://archive.org/details/americanbirds00finl His advocacy was important in establishing a number of NWRs including Three Arch Rocks, and the Klamath Basin refuges. The William L. Finley NWR in Oregon, established in 1964 was named in his honor https://www.fws.gov/refuge/william-l-finley</p>
1908	<p>Conference on conservation of natural resources: The Governors' Conference on the Conservation of Natural Resources, organized by Gifford Pinchot and largely financed by Pinchot himself, was held at the White House, propelling conservation issues into the forefront of public consciousness and stimulating a large number of private and state-level conservation initiatives. The conference's Proceedings were published in 1909 https://archive.org/details/proceedingsofcon00conf. A second such Conference was held at the end of the year to receive the recommendations of the National Conservation Commission. The predominant focus of the effort was on forests, minerals, lands, and water with only peripheral attention given to fish and wildlife.</p>
1908	<p>Nature essays: "The Lay of the Land" by Dallas Lore Sharp is published http://memory.loc.gov/cgi-bin/query/r?ammem/consrvbib:@FIELD(NUMBER(vg33)). As more and more Americans lived in cities, a generation of writers younger than the revered John Burroughs sustained the American tradition of the nature-essay to guide their fellow-countrymen into a continuing appreciation for the natural world. Sharp</p>

	<p>was one of the best, most prolific and most popular of these, a Bostonian professor who excelled at writing charming, disarmingly personal, reflective nature-essays that were often especially articulate and perceptive about the human encounter with the natural world. Sharp's subject definitely is not wilderness; it is, rather, the pastoralist's woods and fields in which most Americans came to know "nature" (one of Sharp's other books is appropriately titled Wild Life Near Home). Nevertheless, like Thoreau and Burroughs before them, Sharp and his peers prepared Americans to be sensitive to the natural world in ways which ultimately made wilderness, too, seem something to be valued and preserved. This book has particular relevance to the history of conservationism, because in addition to providing examples of Sharp's nature-essays, its chapter on "The Nature Movement" reflects on turn-of-the-century-Americans' infatuation with nature--a trend to which early conservationism owed a great deal of its identity--and attempts to situate this movement within the history of American culture.</p>
1908	<p>2nd Audubon Warden killed: Audubon Warden Columbus McLeod was presumed to have been murdered while enforcing game laws in Lee County, Florida. He was searching for egret hunters at Cayo Pelau Island when he disappeared. His boat was found sunk with sand sacks tied to it and his hat was located nearby with two axe chips, blood, and hair on it. His body was never located. This second death of an Audubon warden sparked a national campaign against the wearing of feathers, and shifted public sentiment in favor of stronger enforcement of wildlife protection laws and prosecution of plume hunters.</p>
1909	<p>New bird reservations added: 27 new bird reservations were established this year by President Roosevelt through executive orders. EO 1019 established the Hawaiian Islands reservation, EO 1032 established 17 reservations on Bureau of Reclamation reservoirs, EO 1037 established the Bering Sea reservation in AK, EO 1038 established the Fire Island reservation in AK, EO 1039 established the Tuxedni reservation in AK, EO 1040 established the Saint Lazaria reservation in AK, EO 1041 established the Yukon Delta reservation (about 15 million acres in size) in AK, EO 1042 established the Culebra reservation in PR, EO 1043 established the Farallon reservation in CA, EO 1044 established the Pribilof reservation in AK, and EO 1049 established the Bogoslof reservation in AK. This raised the number of federal bird reservations to 51.</p>
1909	<p>National Bison Range established: Congress establishes the National Bison Range in Montana and appropriates \$13,000 for fencing to protect bison. This is believed to be the first appropriation of funds for the Biological Survey to manage a wildlife reservation. Bids for the fencing project came in too high and the fence was erected by employees of the U.S. Forest Service. Bison were reintroduced to the Range by donation of 37 bison by the American Bison Society and 3 from the Corbin herd in NH.</p>
1910	<p>Military deployed to protect Hawaiian birds: President Roosevelt for the second time (see entry for 1904) deploys military assistance to reduce destruction of birds in the Hawaiian territories. The Revenue-Cutter Service dispatched the cutter Thetis from Honolulu and arrested 23 Japanese poachers on Laysan Island, Hawaiian Islands Bird Reservation, after they destroyed nearly 300,000 birds. Poachers were prosecuted and deported.</p>
1910	<p>Reservations in Alaska published: "National Bird and Mammal Reservations in Alaska in Charge of the U.S. Department of Agriculture" is published by the Biological Survey as Circular 37. It shows the establishment record and a map for each of 7 reservations (Bering Sea, Saint Matthew, Fire Island, Tuxedni, Saint Lazaria, Yukon Delta, Pribilof, Bogoslof). Learn more at www.biodiversitylibrary.org/item/277913#page/9/mode/1up.</p>
1911	<p>Elk Refuge advocated and authorized: Grass roots efforts to set aside lands for elk were led by Jackson, WY resident Stephen Leek whose photos and speaking advocating for protection of elk earned him the name of "The Father of Elk". https://jacksonholehistory.org/national-elk-refuge-1912-2012/. His advocacy prompted the Biological Survey to send Edward A Preble to the area in 1911 to conduct a thorough study of the Jackson Elk Herd. Preble's "Report on Condition of Elk in Jackson Hole, Wyoming, in 1911" contained suggestions for a winter refuge for elk. https://ia802901.us.archive.org/12/items/reportonconditio40preb/reportonconditio40preb.pdf Congress authorized the refuge in 1912 and provided \$45,000 for acquisition and maintenance of the refuge. This is the first instance of Congress providing land acquisition funding for a refuge. For more about the National Elk Refuge see https://www.fws.gov/refuge/national-elk/about-us</p>

1912	<p>Federal wild life reservations described: The Bureau of Biological Survey publishes Circular 87 "National Reservations for the Protection of Wild Life" by T. S. Palmer https://archive.org/details/CAT31414456. It describes lands protected by the federal government either directly or incidentally to benefit wildlife. A total of 97 reservations were identified in 26 States and Territories and the District of Columbia. Managed within 7 federal Departments, they included: a) 10 national parks; b) 5 national military parks; c) 9 national game preserves and other refuges for wild life; d) 56 national bird reservations; e) 10 reservations for aquatic species; and f) 7 national reservations made game preserves in whole or in part by State laws. Palmer authored another article in 1913 that focused specifically on the national bird reservations https://digitallibrary.amnh.org/handle/2246/6337</p>
1912	<p>Chronology of game laws published: Bulletin 41 of the Biological Survey "A Chronology and Index of the more important events in American Game Protection from 1776 to 1911", gives an overview of local, state, and federal laws over this 135-year time-frame. https://archive.org/details/chronologyindexo41palm It describes the patchwork of measures and emerging patterns during this period of settlement of the U.S. Focusing mostly on state laws, the introduction concludes "In no other country in the world have laws for the protection of game been passed in such numbers or amended so frequently". State laws became more numerous with time and a table is included indicating 1,324 laws were enacted during that decade 1901-1910. Among the topics touched on was the failure of legislation to save the buffalo and the passenger pigeon.</p>
1913	<p>Migratory Bird Act enacted: Congress passes the Migratory Bird Act or Weeks-McLean Act, declaring all migratory and insectivorous birds to be within the custody and protection of the federal government; this is eventually superseded by the Migratory Bird Treaty Act of 1918. This is the first federal legislation to establish the federal government's role in managing migratory birds for the benefit of the nation's citizens. To learn more about the history of migratory bird conservation see https://www.fws.gov/program/migratory-birds/about-us</p>
1913	<p>"Our Vanishing Wildlife" published: "Our vanishing wild life; its extermination and preservation" by William T. Hornaday is published http://memory.loc.gov/cgi-bin/query/r?ammem/consrvbib:@FIELD(NUMBER(vg03)) https://www.youtube.com/results?search_query=our+vanishing+wildlife+hornaday. Hornaday, then Director of the New York Zoological Society, was one of the nation's leading advocates of wildlife conservation in this era. This unsparing manifesto was written to accompany Hornaday's launching of the Permanent Wildlife Protection Fund; it is thus (in the words of historian Stephen Fox) both "a campaign tract" and "one of the first books wholly devoted to endangered wild animals" (John Muir and His Legacy: The American Conservation Movement [Boston: Little, Brown and Company, 1981], p. 149). It is also a landmark of conservation history which had a profound effect on the thought of Aldo Leopold, among others. The book often uses militaristic and moralistic language as it surveys the history and causes of wildlife destruction in America and elsewhere, and describes a lengthy program to protect remaining wildlife for the future.</p>

Era #3: MIGRATORY BIRD HABITATS: A CONTINUING FOCUS (1914-1953)

This era marks decades 2 through 5 of what would later become the National Wildlife Refuge System. During these 4 decades the U.S. population grew from 97 (52% rural) to 160 (35% rural) million. This was an era of dramatic events and changes. Among them:

- World War I (1914-1918) and II (1939-1945) were fought
- the Great Depression of the 1930s had major cultural impacts, including the role of the federal government
- drought and dust storms during the Dustbowl era of the 1930s had major economic and cultural impacts especially in the mid-section of the country
- the population continued to expand and shift towards increasing urbanization
- the mass production of automobiles and their ready availability dramatically impacted every aspect of American trade and culture (auto ownership tripled during the 1950s)
- electricity was made available throughout most of the country
- commercial airline travel was emerging as a new way to travel
- increases in the size and nature of mechanized equipment as well as the expanded use of a variety of herbicides and pesticides dramatically changed agricultural practices
- advances in various technologies expanded factories and industry of all types and along with it, increasing pollution loads that were given little attention
- transportation advances increased international trade

During this 4-decade period of tremendous changes and challenges, the conservation of migratory birds, especially waterfowl, was the focus for the growing Refuge System. Birds, especially those that cross state and international borders, remained in decline as the human population expanded across the landscape. Market hunting and commercial collection of bird parts continued in many areas. Draining of wetlands for agriculture and the sprawl of cities and industries spotlighted habitat loss as another factor in migratory bird population declines.



Conservation of waterfowl such as this colorful male wood duck was of high interest during this era (with a particularly major push in the late 1930s and early 1940s) (Wikimedia, photo by Frank Vassen).

The federal government first exerted authority over wildlife in 1900 with enactment of the Lacey Act which outlawed interstate shipment of wild animals or birds killed in violation of state laws. Migratory birds received expanded protections in the Weeks-McClean Law in 1913. The Migratory Bird Treaty Act of 1918, replaced Weeks-McClean and implemented U.S. obligations

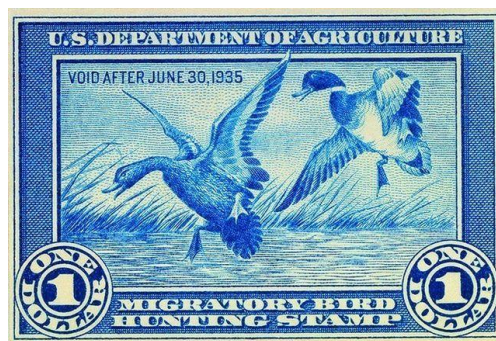
under several treaties and conventions. This expanded federal role in managing migratory birds included providing regulations to control taking of migratory birds. In implementing this Act, it soon became clear that effective management would require increased habitat protection. Refuges continued to be established primarily by Executive Order, but were still for the most part too few and too small to ensure the future of such wide-ranging migratory species as waterfowl and shorebirds.

The Upper Mississippi River Fish and Wild Life Refuge was established in 1925 to protect fish, wildlife and plants along over 250 miles of the River. It was the first migratory bird refuge authorized and funded by Congress (funding to acquire lands for a big game reserve was provided in 1912 for the National Elk refuge). The Migratory Bird Conservation Act in 1929 provided for establishment of the Migratory Bird Conservation Commission to oversee refuge acquisitions and called for refuges to be managed as “involute sanctuaries”. As part of President Franklin Roosevelt’s New Deal, Congress bolstered the Refuge System by creating the Civilian Conservation Corps in 1933. Over the next eight years, thousands of CCC and Works Progress Administration workers improved habitat and built the infrastructure of more than 50 national wildlife refuges.

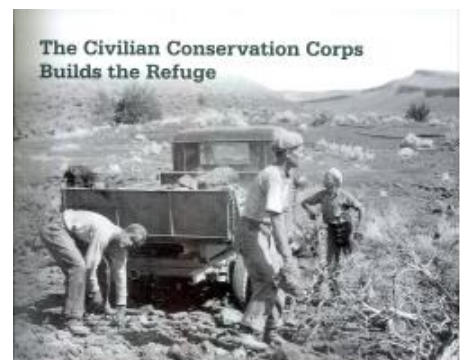
Of great importance was President Franklin Roosevelt’s appointment in 1933 of a “blue ribbon” committee, consisting of Thomas Beck (Chair), Jay Norwood “Ding” Darling, and Aldo Leopold to study and advise him on waterfowl needs. Their 1934 “Report of the President’s Committee on Wild-Life Restoration”, included recommendations to immediately begin to acquire 22 million acres of lands to protect wildlife habitats, to dedicate \$25 million for land acquisition and another \$25 million for development and management of those lands. This dynamic conservation trio alerted the nation, as no other group had done before, to the serious crisis facing waterfowl and other wildlife as a result of drought, over-harvest, and habitat destruction. They campaigned vigorously for funds to combat these problems. Also, the Migratory Bird Hunting and Conservation Stamp Act (known as the Duck Stamp Act) enacted in 1934 provided funding that enabled the Refuge System to grow in the years that followed.



The Ding Darling cartoon that accompanied the “Report of the President’s Committee on Wild-Life Restoration”



Duck Stamps provided long-term funds to acquire lands for the Refuge System. Between enactment in 1934 and today, about 6 million acres have been acquired.



CCC enrollees such as these at Malheur NWR, OR worked at over 50 refuges to build much of the Refuge System’s early infrastructure.

In 1935, Darling “the man who saved the ducks” was appointed to head the Bureau of Biological Survey and he campaigned vigorously for funds to acquire wildlife refuges. He was successful in his efforts and over 3 million acres of national wildlife refuges were acquired during his less than 2-year tenure (his tenure was brief due to ill health). Another of Darling’s successes was that he recruited a dynamic and energetic young Midwesterner, J. Clark Salyer II, to manage the fledgling refuge program. For the next 31 years, until his death in 1966, Salyer was the primary driving force in taking a systematic approach to preserving habitat to restore North America’s waterfowl. He led the selection of new refuge areas and campaigned for their acquisition (the System grew from about 1.5 million acres in the mid-1930s to about 29 million acres at his retirement in 1961). Salyer worked tirelessly to defend the integrity of refuges, to protect the wildlife they harbored, and to see that refuges were managed to best serve the wildlife resource. Theodore and Franklin Roosevelt, Darling, Ira Gabrielson (Chief of the Bureau of Biological Survey from 1935-1940), and others had a profound influence on the development of the Refuge System, but Salyer was unquestionably the “father” of the system. The foundational imprints of his involvement remain to this day.

An extended system of waterfowl refuges was urgently needed if North America’s ducks and geese were to survive.



Above, Ding Darling in a 1954 article reminisces about the struggles with waterfowl conservation in the 1930's



J. Clark Salyer in his article "A Program for Waterfowl Restoration" (1934) described his vision for rescuing waterfowl. While his systematic approach emphasized nesting areas as of highest need, it also recognized:

- 1) the need to also apply best science to protecting migration areas and*
- 2) the need to provide adequate funding and personnel to appropriately restore and manage refuge lands.*

Information on funding and staffing to manage refuges during this era is fragmented but overall budgets were quite limited. The establishment of CCC camps on refuges brought considerable attention to the fact that improvements to refuges for such things as water management impoundments, and roads and trails for visitation and management brought considerable attention to the benefits that would accrue to refuge lands given proper restoration and management. Ira Gabrielson's 1943 book "Wildlife Refuges" also increased the awareness that refuges were not lands just to be set aside but to achieve their intended purpose, they require management.

Early in this era, staffing for wildlife reservations was meager and consisted predominantly of year-round or seasonal wardens. The Bureau of Biological Survey's 1916 annual report indicates that there were 67 bird reservations and 5 mammal reservations in place at the time and that "warden service for longer or shorter periods of time has been provided by the Bureau of Biological Survey for about 1/3 of the reservations". The Biological Survey's 1920 annual report indicated that "10 of the 69 bird reservations had paid warden service throughout the year and at 8 other reservations part-time warden service is maintained during the nesting periods, the hunting season, or at times when serious trespass is likely to occur. Through the cooperation of the Reclamation Service, a general measure of protection is provided on most of the 19 bird reservations located within Reclamation projects." A 1929 reference indicated that field staffing for reservations consisted of full-time reservation protectors at 5 big game refuges and 6 principal bird refuges. Protection was provided at 5 other bird reservations by either private citizen volunteers or by Bureau of Reclamation personnel. The Upper Mississippi Wild Life and Fish Refuge had a staff of about 10 (the refuge was undergoing active expansion at this time). The FY 1935 budget for wildlife reservations was \$434,000; no mention was made of staffing. The 1953 budget for migratory bird and mammal reservations was \$1.8 million; the breakout of staffing devoted to these reservations was not given but is estimated as under 300.



In this era the developing science of wildlife restoration and management was rapidly advancing. Refuge System employees developed and tested a wide variety of habitat restoration strategies and became experts at wildlife and landscape restoration, a hallmark of the Refuge System to this day. Water control structures such as those in the photo to the left are widely used on refuges to improve habitat for a wide variety of wetland associated wildlife.

Despite sparse staffing, Refuge System employees were innovative in developing expertise in a variety of areas. Restoration and management of wildlife habitats, use of prescribed fire in managing wildlife, taking a systematic approach to monitoring of wildlife populations, reintroducing declining wildlife, improving and maintaining facilities in sensitive environments, working with a variety of partners in developing and implementing shared goals, and working within communities and with volunteers were all skills that refuge employees developed and applied as they sought to improve conditions for wildlife.

Interest in public visitation was also growing during this era. Although modest visitation was almost certainly underway prior to this time, the first mention of visitation by the Biological Survey came in the 1915 report of the Biological Survey that indicated 3,563 people visited the Niobrara game reservation in Nebraska. Subsequent Biological Survey annual reports only sporadically mentioned visitation to reservations. The first systematic estimate of visitation came in 1951 when an estimated 3.4 million people visited refuges; 0.2 million visitors hunted, 1.3 million fished, and 1.9 million participated in miscellaneous uses. At this point there was little legislative direction concerning visitation to wildlife reservations with the only legislative reference being the 1949 amendments to the Duck Stamp Act to allow hunting on up to 25% of the areas acquired from Duck Stamp funds.

Despite the nation's challenges during this 4-decade era; 2 world wars, the Great Depression, and the ecological catastrophe of the Dust Bowl; the Refuge System grew considerably. During this historic time; an additional 235 units including 5.6 million acres in Alaska and 9.2 million acres in the rest of the country became part of the System. By the end of the Refuge System's first half century in 1953, this collection of conservation lands was emerging as a true nationwide success story; it included 300 units in 42 states and three territories. It protected a total of 17.6 million acres, including 9.6 million acres in the lower 48 states.

Table 3. Timeline for ERA #3: Migratory bird habitats a continuing focus (1914-1953)

Overview: During these 4 decades the U.S. population grew from 97 (52% rural) to 160 (35% rural) million. New wildlife reservations were established throughout the era with primary emphasis on saving waterfowl. With the support of President Franklin Roosevelt and his efforts to save the ducks; Ding Darling, J. Clark Salyer and others would identify new lands for acquisition in a manner designed to restore America's depleted waterfowl resources during the "Dust Bowl" years. Ding Darling aggressively sought funds for refuge land acquisition. Important legislation during the era included the Migratory Bird Treaty Act and the Duck Stamp Act. During this historic time; an additional 235 units including 5 million acres in Alaska and 8.9 million acres in the rest of the country became part of the System. This brought the total system to 300 reservations encompassing 17.3 million acres (8 million acres in Alaska). 102 of these refuges were staffed. Increased transportation options through the availability of the automobile, and increasing urbanization contribute to growing public interest in visiting refuges. The first systematic collection of information on visits to refuges occurred in 1951 with 3.4 million visits reported (0.2 million hunting, 1.3 million fishing, and 1.9 million visits for miscellaneous uses).

1914	Last passenger pigeon: Martha, the last passenger pigeon, dies at the Cincinnati zoo. These iconic birds once darkened the skies of early America with an estimated 3 to 5 billion birds at the time of first European settlement. Once considered an endless resource, they were trapped, shot, and slaughtered at will and by the beginning of the 19th century had virtually disappeared. The last Carolina Parakeet also died at the Cincinnati zoo. Both species are extinct. A video on the history of the passenger pigeon is available at https://www.youtube.com/watch?v=sHSUQ_JsPnY
1914	World War I: First World War begins and continues through 1918.
1915	Poaching at Laysan Island: A third episode of large-scale poaching (see entries for 1904 and 1910) is discovered on Laysan Island, Hawaiian Islands. An estimated 150,000 to 200,000 birds were killed in this episode.
1915	Early mention of visits: The Bureau of Biological Survey's annual report for the first time mentioned public visits to wildlife reservations. It reported visits only for Niobrara game reservation in Nebraska and indicated 3,563 visitors for the year.
1915	Conservation stewardship promoted: The Holy Earth by L.H. Bailey was published. Bailey; a professor of horticulture at Cornell University, founder-editor of the periodical Country Life in America and leader of the Country Life movement, was a leading advocate for the Nature Study movement, and an active conservationist. The Holy Earth was his most important work http://memory.loc.gov/cgi-bin/query/r?ammem/consrvbib:@FIELD(NUMBER(vq13)) . It promoted an ethic for the man-nature relationship that helped lay the foundation for Aldo Leopold's redefinition a generation later. Like his contemporaries Nathaniel Southgate Shaler and (less explicitly) John Muir, Bailey here elevates the concept of conservation stewardship to a comprehensive ethical imperative, expanding conservationism's kindred piety toward a radical logic: "If God created the earth, so is the earth hallowed; and if it is hallowed, so must we deal with it devotedly and with care that we do not despoil it, and mindful of our relations with all beings that live on it.... To live in sincere relations with the company of created things and with conscious regard for the support of all men now and yet to come, must be of the essence of righteousness" (pp. 14-15). Such a vision celebrates contact with the earth and nature as a source of renewal for the human spirit, a conviction Bailey shares with many contemporaries who contributed to conservationist thought.
1915	Rise of animal damage control: Beginning as a minor program in 1915, by the early 1920's, predator and rodent control became the dominant activity within the Bureau of Biological Survey. For many years the financial support received from western States and livestock associations well exceeded monies appropriated by Congress for the Survey's budget.

1916	<p>Biological Survey organization: The Bureau of Biological Survey's administrative responsibilities are expanded to focus on five program areas: 1) investigations of food habits of birds and mammals in relation to agriculture; 2) biological investigations with special emphasis on the distribution of native species; 3) supervision of reservations set aside for birds and mammals and the preservation of wild game (there were 67 bird reservations and 5 big game reservations in place at the time); 4) enforcement of the Lacey Act; and, 5) administration of the Federal Migratory Bird Act.</p>
1916	<p>Field named 2nd Chief of wildlife reservations: Dr. George Wilton (G. W.) Field was the 2nd "Chief" of what would in time become the Refuge System and was the first to have wildlife reservations as his primary focus. Born in Massachusetts in 1863, with degrees from Brown University (A.B., 1887; A.M., 1890) and Johns Hopkins University (PhD, 1892), and postdoctoral studies in Naples, Italy and Munich, Germany; Field was most known for his work in marine biology. Among other aspects, he was an expert on water pollution and the effects of industrial pollutants on oysters and other marine organisms. He was a director of the Massachusetts Audubon Society. Field joined the Bureau of Biological Survey in December 1916 as supervisor of the 74 national bird and mammal reservations. He served in that capacity until 6 December 1919 when he resigned to take a position as scientific fisheries expert with the government of Brazil. A 1915 reorganization of the Biological Survey established 5 sections, one of which was solely devoted to supervision of wild life reservations. Chief of that Section is what Field was appointed to but the nation's attention during his tenure was focused on World War I and conservation of wildlife reservations did not receive a great deal of attention (the Migratory Bird Conservation Act was enacted during this time however). Also, beginning as a minor activity in 1915, by the early 1920's, predator and rodent control became the dominant activity in the Biological Survey. For many years the financial support received from western States and livestock associations well exceeded monies appropriated by Congress for the Survey's budget. This likely had an impact on the Survey's ability to focus on wildlife reservations. Biological Survey Chiefs during Field's tenure were Herbert W. Henshaw (1916) and E. W. Nelson (1917-1919).</p>
1916	<p>Migratory Bird Convention: The Convention Between the U.S. and Great Britain (for Canada) for the Protection of Migratory Birds is signed. This would set future conservation efforts in motion including establishment of federal laws to protect migratory birds and other wildlife.</p>
1916	<p>TR authors Bird Refuges of Louisiana: Scribner's Magazine publishes "The Bird Refuges of Louisiana" by Theodore Roosevelt. The article describes his 1915 visit to these coastal Louisiana refuges along with observations on conservation of these areas https://modjourn.org/issue/bdr466314/#</p>
1916	<p>Early staffing for wildlife reservations: Staffing for wildlife reservations was meager and primarily confined to full time or seasonal "wardens". The Bureau of Biological Surveys annual report indicates that there were 67 bird reservations and 5 mammal reservations in place at the time and that "warden service for longer or shorter periods of time has been provided by the Bureau of Biological Survey for about 1/3 of the reservations". A law enacted this year (39 Stat. 1106) put in place a new requirement effective July 1, 1919 that prohibits government salaries from being supplemented by outside sources. This ended all remaining Audubon warden arrangements and required transitioning to only government funds for wardens. For a discussion of Audubon's role in the early establishment of bird reservations see https://archive.org/details/americanmuseumjo16amer/page/403/mode/1up (pages 394-402).</p>
1917	<p>"The Bird Study Book" is published: T. Gilbert Pearson was a leading advocate for the conservation of America's birds during his lifetime (1873-1943). With other ornithologists he organized the National Association of Audubon Societies in 1905 and served as secretary and executive officer from 1910 to 1920 and as president from 1920 to 1935. His book, "The Bird Study Book" (https://archive.org/details/cu31924022530343/mode/2up) includes wide ranging topics associated with bird study and conservation, extending beyond study to include discussions on the impact of the millinery trade on birds, the development of laws to protect birds, the establishment of wildlife reservations, and the Audubon Society's efforts in these plus other aspects of bird conservation such as providing warden service to protect birds.</p>

1918	<p>Growing appreciation for reservations: The Annual Report of the Bureau of Biological Survey noted "The 69 Federal bird reservations continue to furnish attractive feeding, breeding, and resting places for many species of birds useful on account of their value either for food, as insect destroyers, or for their beauty. The value of well-chosen bird reservations as an asset to the country is becoming more and more appreciated. Among the most notable of the Federal reservations are those at Klamath and Malheur Lakes, in Oregon, and Big Lake, in Arkansas. As funds become available, it will be possible to develop some of these reservations and greatly increase their usefulness." The report also noted considerable increases in visitation to big game reservations with a train stop at Moise cited as contributing to increased visitation to the National Bison Range.</p>
1918	<p>Migratory Bird Treaty Act enacted: The Migratory Bird Treaty Act is enacted. implementing four international conservation treaties that the U.S. entered into with Canada in 1916, Mexico in 1936, Japan in 1972, and Russia in 1976. It is intended to ensure the sustainability of populations of all protected migratory bird species.</p>
1920	<p>Stone named 3rd Chief of wildlife reservations: Dr. Herman Fred (H.F.) Stone became the 3rd "Chief" of what is today the Refuge System when he became supervisor of Biological Survey's section of national mammal and bird reservations on July 1, 1920. The 1920 Biological Survey annual report indicated 75 big game and bird reservations were in place (4 big game, 70 bird reservations, and 1 combination {Niobrara}). Descriptions of activities at the big game reservations imply staffing presence at those locations which typically were larger in size and had ongoing activities associated with building fenced enclosures, managing large game to include a large elk feeding program at the Elk refuge, and fighting wildfires. Overall staffing remained relatively sparse as only 10 of 70 bird reservations had year-round warden protection. An aspect of thinking and acting like a system was in the 1921 report which indicated that "the practice of temporarily transferring wardens from one reservation to another to broaden their experience and usefulness has been successful. It is now contemplated filling the assistant warden vacancies as they occur with young men of proper fitness to develop into wardens, thus enabling them to grow up in the service. The practice of transferring these assistants to different reservations and of detailing them for a short time to the central office at Washington will fit them for a more effective performance of their duties and provide a well-trained personnel competent to develop the reservations along the lines of greatest usefulness." E. W. Nelson was Chief of the Bureau of Biological Survey during Stone's tenure (1920-1922).</p>
1920	<p>Federal role for bird protection affirmed: The Supreme Court ruled in <i>Missouri v. Holland</i>, upholding the constitutionality of the Migratory Bird Treaty and the Migratory Bird Treaty Act.</p>
1920	<p>Status of warden presence: The Biological Survey annual report indicated that 10 of the 69 bird reservations had paid warden service throughout the year and at 8 other reservations part-time warden service is maintained during the nesting periods, the hunting season, or at times when serious trespass is likely to occur. Through the cooperation of the Reclamation Service, a general measure of protection is provided on most of the 19 bird reservations located within Reclamation projects.</p>
1922	<p>Yukon Delta reservation revoked: The 15-million-acre Yukon Delta Bird Reservation is revoked (reducing the total acreage of bird and mammal reservations to 3.4 million acres). Also, a total of 27 reservations of the 70 reservations (January 1, 1922) were reported to have warden service. The Biological Survey annual report describes them as 9 being permanent positions, 11 were part time, and 10 were cooperative.</p>
1922	<p>Riley named 4th Chief of refuges: Smith Riley was the 4th "Chief" of what is today the Refuge System. He was born in Montgomery County, Maryland in 1878. The early part of his career was mostly with the U.S. Forest Service including a stint as the first District Forester in Denver, CO. From 1920 to 1922 he was a forestry advisor for Rock Creek Park in Washington DC working for the War Department. In 1922, he joined the U.S. Biological Survey as Chief of the Division of Game and Bird Reservations. He held that position until poor health caused him to retire in 1925. In 1923, the Biological Survey managed 68 bird and big game refuges which included 64 bird reservations and 4 big game (Bison Range, Wind Cave, Niobrara, and Sully's Hill). The June 30, 1925 annual report of the Biological Survey indicated: "Sixty-nine Federal large game and bird refuges are administered in the United States, Alaska, Porto Rico, and Hawaii through warden service and inspections; hay is produced on the elk refuge in Wyoming for winter feeding</p>

	of the elk; and disposal is made by transfer for restocking purposes or by sale of surplus animals on the five big-game preserves under the bureau's jurisdiction." E. W. Nelson remained Chief of the Bureau of Biological Survey throughout Riley's tenure.
1922	Izaak Walton League founded: The Izaak Walton League is founded. Their mission is to conserve, restore, and promote the sustainable use and enjoyment of our natural resources, including soil, air, woods, waters, and wildlife. They led the effort to establish the Upper Mississippi NFWR, were heavily involved in land protection at the National Elk Refuge in Wyoming, and were leaders in establishing the Land and Water Conservation Fund. https://www.iwla.org/100years/history
1925	Goldman named 5th Chief of refuges: E. A. Goldman was the 5th "Chief" of what is today the Refuge System. The Biological Survey organization in 1926 included Administration plus seven divisions, one of which was the Division of Game and Bird Reservations which managed five big game preserves, 67 bird reservations, and was working to acquire additional lands. The 1927 annual report indicated a growing demand for public visitation, and a growing interest in establishing additional refuges but also indicated that lack of manpower and funding was a hindrance in both regards. Following his tenure as Chief of the Division of Game and Bird Reservations, Goldman remained with the Biological Survey in a research function. Bureau of Biological Survey Chiefs during Goldman's tenure as refuge chief (1925-1928) were E. W. Nelson (1926-1927) and Paul G. Redington (1927-1928).
1925	Upper Miss Refuge established: The Upper Mississippi River Fish and Wild Life Refuge is established to protect fish, wildlife and plants along over 250 miles of the River. It was the first migratory bird refuge authorized and funded by Congress. \$1.5 million was provided for land acquisition (the only previous funding for land acquisition was in 1912 when \$45,000 was provided to acquire and maintain lands for the National Elk refuge) https://www.fws.gov/refuge/upper-mississippi-river .
1925	Alaska Game Law enacted: The Alaska Game Law is passed, authorizing the Bureau of Biological Survey to work with the Alaska Game Commission to manage fish and wildlife in the territory of Alaska.
1927	Early use of prescribed fire: Unplanned and unwanted wildfires have always been part of refuge management, but the use of prescribed burning as a habitat improvement tool began as early as 1927 in Florida on land that was later designated St. Marks National Wildlife Refuge. During the 1930's, when other agencies stopped burning programs because of the notion that all fire was "bad," some refuge managers quietly continued. Refuges have had outstanding prescribed burning programs and have been recognized as pioneers and experts in the application of scientifically-derived prescribed fire for habitat management and wildlife protection. https://www.fws.gov/story/managing-fire#:~:text=%E2%80%9CThe%20U.S.%20Fish%20and%20Wildlife%20Service%20ignited%20its,communities%20has%20been%20a%20Service%20priority%20ever%20since.%E2%80%9D
1927	Preservation of Texas Longhorn cattle: Threatened with extinction, special Congressional funds were made available to preserve a significant cultural and historical resource by establishing a herd of Texas Longhorn cattle on the Wichita Mountains NWR. Congress established management objectives to maintain and preserve under reasonable natural conditions, with little change and as true as is possible, a Texas Longhorn herd for the enjoyment and study by present and future generations.
1928	Sheldon named 6th Chief of Refuges: Colonel Harold Pearl (H.P.) Sheldon was the 6th "Chief" of what is today the Refuge System. Born in Vermont in 1888; he joined the Army in 1910, served in World War I in Europe and was commandant at Fort Ethan Allen in Vermont until 1919. He was Vermont Commissioner of Fish and Game from 1921 until 1926 when he was named Chief U.S. Game Warden with the Bureau of Biological Survey. A reorganization of the Biological Survey in 1928 combined the Division of Game and Bird Reservations, the Division of Alaskan Wild Life, and the Division of Migratory Bird Treaty and Lacey Acts Administration into a single Division of Game and Bird Conservation and H. P. Sheldon, Chief of the latter of the combined Divisions was named Chief of the new Division. This combining of Divisions meant there was no longer an administrator at the national level focusing only on wildlife refuges. The same annual report describing this new organization also noted growing public interest in establishing more wildlife refuges and developing a nationwide approach to setting aside lands for wildlife. At one point the report concludes that "It is now recognized that the refuge system or some extension of the principle is the only means by which the extermination of many of the valuable forms of wild life can be prevented in North America. To be most effective, a game or bird reservation must be given constant attention by a

	<p>resident protector” The Biological Survey underwent another reorganization in 1929. The new organization included Administration plus seven Divisions, including a Division for Maintenance of Wild-Life Reservations and a Division of Land Acquisition. H. P. Sheldon continued as Chief of the Division for Maintenance of Wild Life Reservations until 1934 and the first Chief of the newly designated Division of Land Acquisition was Rudolph Dieffenbach. Dieffenbach would acquire more land for American wildlife than any other figure before or after his era (he supervised acquisition of lands for 272 refuges between 1925 and 1952 https://commons.wikimedia.org/wiki/File:Refuge_Update_November_December_2008.pdf. The Biological Survey published "Refuges Being Created for the Protection of Migratory Birds" (1931 Yearbook of Agriculture, p. 456-459, at https://archive.org/details/yoa1931/page/n594/mode/1up which described the effort to develop a nationwide system of refuges to protect migratory birds and seeks public cooperation in the effort. In 1934 Sheldon was placed in charge of the Division of Public Relations. Sheldon retired in 1943. He was a firearms expert. In the 1930s and 40s he was the editor of the "Guns and Game" department of "The Sportsman" and subsequently for "Country Life" and "Outdoors Magazine". He was also a contributor of hunting vignettes and anecdotes to other periodicals and published collections of his essays. Among his writings is a 2 part series on the "History and Significance of American Wildlife" published in 1938 and 1939 as Biological Survey Leaflets https://archive.org/details/historysignifica108shel and https://archive.org/details/historysignifica126shel. The Bureau of Biological Survey Chief during Sheldon’s tenure as Refuge System Chief was Paul Redington.</p>
1929	<p>Dieffenbach, Chief of Land Acquisition: Rudolph Dieffenbach becomes first Chief of the Biological Survey’s Division of Land Acquisition. During his career he acquired more land for American wildlife than any other figure before or after his era. “Dief,” as associates called him, began his Biological Survey career in 1925 and was charged with acquiring lands for the newly authorized Upper Mississippi River Wildlife and Fish Refuge. After Congress enacted the Migratory Bird Conservation Act in 1929, Dieffenbach took over the new Division of Land Acquisition. He continued in that role until 1945 when he was selected to head the FWS’s new Office of River Basin Studies, created when it became evident that protecting fish and wildlife resources required coordination with the Corps of Engineers and the Bureau of Reclamation on federal water projects. He retired in 1952. During his career he oversaw the acquisition of land for 272 national wildlife refuges. The Refuge System’s Division of Realty today continues to acknowledge his contributions by presenting an annual Rudolph Dieffenbach Award to honor employees who make outstanding contributions to the Refuge System’s land protection mission.</p>
1929	<p>Biological Survey history: "The Bureau of Biological Survey: Its History, Activities, and Organization" by Jenks Cameron is published Cornell University Library Digital Collections Bookreader. Bird and big game reservations were managed within the Division of Game and Bird Conservation (1 of 5 Divisions in the Survey at this time) which had the primary role of enforcing wildlife laws in the U.S. A directory of the 82 bird reservations and 5 big game reservations existing at that time is provided. Field staffing for reservations consisted of full-time reservation protectors at 5 big game refuges and 6 principal bird refuges. Protection was provided at 5 other bird reservations by either private citizen volunteers or by Bureau of Reclamation personnel. The Upper Mississippi Wild Life and Fish Refuge had a staff of about 10 (the refuge was undergoing active expansion at this time).</p>
1929	<p>Migratory Bird Conservation Act enacted: The Migratory Bird Conservation Act is passed, creating the Migratory Bird Conservation Commission to oversee acquisition of refuge lands. This process expedited acquisition of refuge lands and easements as funds became available. The Act also states that refuges are to be managed as "inviolate sanctuaries" for migratory birds.</p>
1930	<p>Growing interest in wild life lands noted: Growing public interest in expanding a nationwide system of wild life lands and the corresponding need to appropriately manage them is reflected in the Biological Survey’s annual report for the year ending June 30, 1930, that included the following statement: “The movement so pronounced last year for the establishment of refuges for the restoration of wild life has been continued, as evidenced by both Federal and State action. This form of conservation may well be considered one of the best established in wild life administration. Its importance will be enhanced as both Federal and State funds are made available for the care and maintenance of areas dedicated as wild-life sanctuaries. Sound plans for the administration of sanctuaries include not only adequate policing but also the development of food resources and the maintenance or provision of a sufficient supply of water and other needs of individual refuges as affected by local conditions. The degree to which these requirements are met often determines the success that may be expected in attaining the objectives of sanctuary areas.”</p>

	National wild-life reservations in place in 1930 are described here https://archive.org/details/nationalwildlife51unit_0
1930	Regulations on Administration of Wild-life Refuges issued: Prior to this time regulations had been issued for several refuges but this is the first set of regulations to be applied to all wildlife refuges (with a few exceptions). Fairly general in nature, the 1930 regulations were 3 pages in length; more expansive regulations were issued in 1938 (15 pages). Regulations to enforce laws under their purview were issued by the Biological Survey between 1914 and 1938. These regulations along with associated laws are at https://babel.hathitrust.org/cgi/pt?id=uc1.b3016204&view=1up&seq=7&skin=2021 . The 1930 refuge regulations start at page 394 and the 1938 regulations start at page 668.
1931	Accomplishments under Migratory Bird Treaty Act summarized: The Biological Survey's annual report for the fiscal year ending June 30, 1931 summarized work done since passage of the Migratory Bird Treaty Act (1929) to identify new areas suitable for acquisition as wildlife refuges. It indicated that 189 units (about 3.7 million acres) in 48 States had been evaluated. Of these, 66 had thus far been found suitable as nesting, resting, and feeding grounds. Also, as of June 30, 1931, there were 92 bird and mammal reservations managed by the Biological Survey with a total of 5.25 million acres.
1931	Nationwide system of refuges encouraged: The Biological Survey publishes "Refuges Being Created for the Protection of Migratory Birds" (recorded in the 1931 Yearbook of Agriculture, p. 456-459, at https://archive.org/details/yoa1931/page/n594/mode/1up which describes the effort to develop a nationwide system of refuges to protect migratory birds and seeks public cooperation in the effort.
1932	Heath hen extinct: Last heath hen seen at Martha's Vineyard, MA; species extinct. https://en.wikipedia.org/wiki/Heath_hen
1932	Accomplishments under Migratory Bird Treaty Act summarized: The Biological Survey's annual report for the fiscal year ending June 30, 1932 reported on progress on land acquisition since passage of the Migratory Bird Conservation Act in 1929. It was reported that 16 new refuges were established in 14 States. A total of about 255,000 acres was added to wildlife refuges. Within that amount, nearly 80,000 acres was acquired by purchase at an average cost of \$4.38 an acre.
1933	Franklin D. Roosevelt elected president: Like his cousin Teddy Roosevelt, FDR was a conservation champion. President from 1933 to 1940, his Administration's programs gave a tremendous boost to wildlife conservation in general and to the growth of the Refuge System in particular. For an overview of the wildlife conservation benefits derived from his "New Deal" activities see: "New Deal" for Wildlife: A Perspective on Federal Conservation Policy, 1933-40 by Theodore W. Cart in The Pacific Northwest Quarterly, Vol. 63, No. 3 (Jul., 1972), pp. 113-120 (available from JSTOR) and https://livingnewdeal.org/tag/national-wildlife-refuge-system-history/ .
1933	Civilian Conservation Corps established: At the urging of newly elected President Franklin D. Roosevelt, Congress created the Civilian Conservation Corps. Over the next eight years, thousands of CCC and Works Progress Administration workers improved habitat and built the infrastructure of more than 50 national wildlife refuges (there were about 100 refuges at the time). To be eligible for enrollment, a CCC recruit had to be a U.S. citizen, in sound physical shape, unemployed, unmarried, and between 18 and 25 years old. Moreover, a recruit had to demonstrate his financial need. The program did not grant enrollment to women. Recruits initially enrolled for 6 months. In return, each CCC recruit received food, clothing, shelter, medical care, and an allowance of \$30 per month (at least \$25 of this was required to be sent to a dependent). CCC camps provided much needed labor to improve refuges but CCC budgets were extremely limited for purchase of supplies. Much of the funding for supplies and materials such as concrete, rock and gravel, building materials etc. came from Duck Stamp receipts The CCC in the National Wildlife Refuge System A summary of accomplishments by the CCC and WPA programs is in the 1939 annual report of the Biological Survey https://upload.wikimedia.org/wikipedia/commons/4/45/Report_of_the_chief_of_the_Bureau_of_Biological_Survey_-_DPLA_-_f8bba9583959b444bc74ab91b3d77d3e.pdf For a report on the nationwide work of the CCC related to wildlife see https://play.google.com/store/books/details/The_CCC_and_Wildlife?id=SGvqM2DXHWsC&qI=US . For a description of how "New Deal" work programs and the Duck Stamp came together to bolster refuges in the

	Mountain Prairie Region of the FWS (CO, KS, MT, NE, ND, SD, UT, and WY) see https://ecos.fws.gov/ServCat/DownloadFile/197289
1934	Duck hunters see empty skies: The fall flight of migratory waterfowl dropped to its lowest point in history due to drought, wetlands drainage, overshooting, and general habitat loss. Ding Darling in 1954 articles in National Parks Magazine http://www.npshistory.com/npca/magazine/jan-mar-1954.pdf and http://www.npshistory.com/npca/magazine/apr-jun-1954.pdf recalls that duck hunters throughout the country in the fall 1934 hunt season were greeted by empty skies due to the worst depletion of North American waterfowl in history. The cry went out "The ducks are gone!". He further recalled "Scientists trained in the interpretation of nature's laws shouted from the housetops the prognosis of a continent without waterfowl. William T. Hornaday, surely a prophet without honor in his own country and the unheeded forewarner of doom, watched with a heavy heart his earlier predictions come true. Banquet audiences gave generous applause to the exhortation of conservation evangelists. The ghosts of extinct passenger pigeons and the bleached bones of the buffalo were nightly materialized in conservation seances from coast to coast to give testimony to the dangers that threatened ducks."
1934	Committee on Wild-Life Restoration: President Franklin Roosevelt appoints the Committee on Wild-Life Restoration. Its members were Thomas H. Beck (chair), a wealthy hunter; Jay Norwood "Ding" Darling, a well-known columnist and conservation proponent; and Aldo Leopold, a respected scientist. They prepared a report https://upload.wikimedia.org/wikipedia/commons/4/4f/Report_of_the_President%27s_committee_on_wild-life_restoration_%28IA_CAT31126980%29.pdf for the Secretary of Agriculture recommending an aggressive program to acquire lands for waterfowl, upland game, mammals, and song, insectivorous and ornamental birds (22 million acres recommended). The report further recommends that \$50 million be earmarked for acquisition and habitat restoration projects and that a "restoration commissioner" be appointed under direction of the Secretaries of Agriculture, Interior and Commerce to supervise wildlife restoration projects government-wide.
1934	Fish and Wildlife Coordination Act enacted: The Act required that the Fish and Wildlife Service be consulted with on all federal water projects. As a result, many national wildlife refuges were established concurrent with completion of federal water projects (mostly Corps of Engineers and Bureau of Reclamation). Over time, 46 refuges encompassing over 2 million acres would be established under these provisions.
1934	Duck Stamp Act enacted: Congress passes the Migratory Bird Hunting Stamp Act that requires a \$1 stamp by all hunters of migratory waterfowl. Funds were to acquire, develop, manage and maintain refuges (funds could be used in law enforcement, research, and general administration as well). https://www.youtube.com/watch?v=7EVwNrzlI1l
1934	Taylor Grazing Act enacted: The Act provided for regulation of uses on public lands, establishment of grazing districts, and wildlife usage. It led to the establishment of several large, jointly managed "Game Ranges" in the West: Cabeza Prieta and Kofa Ranges in Arizona, Desert Game Range in Nevada, Charles Sheldon Antelope Range in Nevada and Oregon, and Charles M. Russell National Wildlife Range in Montana.
1934	Ding Darling – Chief of Biological Survey: Jay Norwood "Ding" Darling is appointed as Chief, Bureau of Biological Survey. Darling's brief tenure (18 months) results in a new and ambitious course for the agency to acquire and protect vital wetlands and other habitat throughout the country for the purpose of restoring our nation's waterfowl. Darling also designed the first Federal Duck Stamp. https://fws.gov/staff-profile/jn-ding-darling-1876-1962 https://siarchives.si.edu/blog/dingdarling Darling was known for his aggressive pursuit of Congressional funds to acquire new refuges. During his brief tenure as Chief of the Biological Survey he was instrumental in securing \$14.5 million to launch efforts to restore our nation's waterfowl. This included: \$1 million from E.O. 6724 (land acquisition), \$5 million in emergency funds from the Federal Emergency Relief Administration and Resettlement Administration (land acquisition), \$6 million from a 1935 amendment to the Duck Stamp Act that directed that this amount would be applied to refuge

	<p>land acquisition from unexpended funds from the 1933 National Industrial Recovery Act, and \$2.5 million in Works Progress Administration funds (primarily applied to improvement of water management and other facilities). This \$14.5 million was a handsome sum of money at that time and played a big part in launching a system of wildlife lands across the country. Although designed for waterfowl, time would demonstrate these lands would be of tremendous benefit to a host of fish and wildlife species.</p> <p>https://www.youtube.com/watch?v=J6JARYP3cNc</p>
1934	<p>Salyer named 7th Refuge System Chief: J. Clark Salyer II was the 7th “Chief” of refuges and was in many ways responsible for formation of the Refuge System. Born in Higgensville, Missouri in 1902, he held a BA from Central College in Fayette, Missouri, in 1927, and an MS from the University of Michigan in 1930. He taught science in public schools of Parsons, Kansas, and as a Professor of Biology at Bethel College, Newton, Kansas, for several years, before accepting a position with the Iowa Fish and Game Commission in 1933. Soon after being appointed as the Chief of the Bureau of Biological Survey, Jay Norwood "Ding" Darling began searching for an individual to manage the bureau's fledgling refuge program. Darling recruited Salyer in June 1934 to oversee the national wildlife refuges. At first, Salyer was reluctant to leave the University of Michigan. According to George Laycock in his book, "The Sign of the Flying Goose," Darling convinced Salyer to take a year's leave of absence from his position to assess waterfowl projects across the country. Salyer was directed by Darling to develop a waterfowl management program using the conservation principles of wildlife management espoused by Aldo Leopold. Such a program, based on habitat needs of migratory birds, had never before been attempted on a national scale. Salyer accepted a permanent position with the Bureau on December 17, 1934 as Chief of the Division of Migratory Waterfowl. Stories of Salyer's energetic work in support of refuges are legendary. Shortly after coming to work for the Biological Survey, he was issued a car to travel around the country visiting potential new refuges. This vehicle provided the means to visit refuges in far-flung locations. According to Laycock, "within six weeks, he (Salyer) had driven 18,000 miles and drawn up plans for 600,000 acres of new refuge lands." He also enjoyed visiting refuge field stations. Refuge managers reported that Salyer would drive hundreds of miles each day in his government-issued Oldsmobile to visit their refuge, then stay with the family overnight or for a meal before commencing on his journey to inspect another refuge on his itinerary. His memory of refuges and projects he inspected was remarkably clear until the day he died. Even after going blind shortly before his retirement, Salyer could recall the specifics of locations he had visited throughout his career during Congressional and Departmental briefings. Salyer is known as the "Father of the National Wildlife Refuge System." Under his direction, the system grew from 1.5 million acres in the mid-1930's to nearly 29 million acres when he retired in 1961. Salyer was the primary architect for President Franklin D. Roosevelt's duck restoration program of 1934-36. Early in his tenure, he focused heavily on acquisition of new refuges but he also added much to the systematic management of refuges by establishing national guidelines in a Refuge Manual that was first issued in 1942 and then updated in 1957. After nearly 30 years of tireless service, health problems forced him into retirement in 1961. He maintained his connection with the FWS in an advisory capacity until his death on his birthday, August 16, 1966. In 1966, the Lower Souris NWR in ND was renamed the J. Clark Salyer NWR to honor his legacy of contributions to the preservation of America's wildlife. Over his 27-year tenure as Chief of Refuges, Salyer served under Biological Survey Chiefs Ding Darling (1934-1935) and Ira Gabrielson (1936-1939) and FWS Directors Ira Noel Gabrielson (1946–1953), Albert Day (1953–1957), and John Farley (1957–1961).</p>
1934	<p>Strategy to restore waterfowl described: The Biological Survey publishes Circular 339 “A Program for Waterfowl Restoration” by J. Clark Salyer that laid out the rationale for the systematic acquisition of lands to restore North American waterfowl. Learn more at https://ia801907.us.archive.org/0/items/programofwaterfo339saly/programofwaterfo339saly.pdf Ding Darling (pages 19-25) and J. Clark Salyer (pages 28-36) provided Congressional testimony on progress of these efforts as of July 30, 1935</p> <p>https://books.googleusercontent.com/books/content?req=AKW5Qad0LD1tvVnPbqE88VFAppmq23VbvVR9Lyi9W3YSYLCz0H54dJtpHdld42RjnzSJqitDG6edOCsVGNyJeN2SSK0EcTi4yhZHOYJSA0DUZ2VgTR70eGwKqfbkK8q2RbaCuxN7YRwVxeFcGD90MjNB_kFpG-l7zE1zjk6LbPRXV6RHgUPmXnL_ERIfMepEaiJ_1CzQkIR5avTDhSGuHOipoBpU1VzW-dNCdIVse2YSTAxleLniD0vus0qhZFF9igm8vUUh0s-DI7UpMilv300SqR-e1CCObg</p>

1935	Historic Sites Act of 1935 enacted: Among the provisions is the listing of National Historic Landmarks important to the country. Today the Refuge System contains 10 National Historic Landmarks. Learn more at National Historic Landmarks (US National Park Service)
1935	Budget for wildlife reservations: The FY 1935 budget for the Bureau of Biological Survey included about \$434,000 to manage wildlife reservations distributed as follows: \$336,000 to maintain mammal and bird reservations, \$80,000 for migratory bird reservations, and \$18,000 for the Upper Mississippi Refuge. No mention was made of the number of personnel included in this budget; however, the official report of the Biological Survey for 1935 indicates that 16 of the 106 refuges in place at this time were staffed. The FY 1936 budget included a little over \$73,000 for management of wildlife reservations.
1935	Reorientation of Biological Survey: In the opening statement of the Biological Survey annual report, Chief J. N. Darling states: "It cannot be said that any valuable form of American wildlife is in a satisfactory condition at the present time. All have suffered from mankind's indifference or greed, but none is in a more precarious situation than our migratory waterfowl. For this reason, practically all lines of work of the Bureau of Biological Survey were to some extent subordinated during the year to the all-important program of waterfowl restoration." Darling's leadership along with conservation programs initiated under the Administration of President Franklin Delano Roosevelt marked a major turning point in the history of the Refuge System and the Biological Survey. Conservation of the nation's waterfowl would be emphasized in a three-pronged approach: 1) systematically protecting wetland habitats in the Refuge System; 2) controlling take through federal frameworks for waterfowl hunting based on continent wide waterfowl population information; and 3) increasing law enforcement efforts.
1935	Darling resigns: "Ding " Darling, known as "the man who saved ducks", resigns as Chief, Bureau of Biological Survey after 18 months of service. FWS Director John Farley in 1956 Congressional testimony on the Duck Stamp would refer to Darling this way, "More than any other single individual in conservation history he proclaimed the plight of drought-stricken and overshot ducks with his eloquent tongue, his facile pen, and his pungent cartoons." Darling vigorously sought funds (he had a role in securing \$14.5 million to purchase and improve refuges which was a huge sum of money at that time) to acquire refuges and 3 million acres were added to the Refuge System during his brief tenure. The 1935 report of the Biological Survey indicated that 925,570 acres of waterfowl habitat was acquired that year at an average cost of \$8 per acre.
1935	Ira Gabrielson – “Mr. Conservation”: Ira Gabrielson becomes Chief of the Bureau of Biological Survey. Known in his time as “Mr. Conservation,” Gabrielson ranks as one of the most noted conservationists of the 20th century. He exerted great influence at a critical time in American history, when evolving wildlife management practices and policies were being merged into our society and government. Among his many accomplishments, he was particularly proud of the expanding National Wildlife Refuge System, establishing the Federal Aid to Wildlife Restoration and Cooperative Wildlife Research Unit programs, creating the Patuxent Wildlife Research Refuge, and organizing an impartial and highly successful wildlife law enforcement team. He assisted in planning the first North American Wildlife Conference, called by President Franklin D. Roosevelt in 1936. His wildlife philosophies are reflected in his books: "Wildlife Conservation" (1941), "Wildlife Refuges" (1943), and "Wildlife Management" (1951).
1935	Dust Bowl: The Dust Bowl era of the mid-1930s saw drought and high winds create massive dust clouds that would dramatically impact particularly agricultural activities in the mid-section of the country. It raised the awareness of the need for new approaches to soil and water conservation. It also highlighted the desperate plight of waterfowl and helped prompt addition of many national wildlife refuges.
1935	Norbeck Continues Conservation Advocacy: Senator Peter Norbeck of South Dakota, a nationally known conservation legislator, played a major role in creation and passage of the Migratory Bird Conservation Act of 1929. He also played a lead role in passage of the Migratory Bird Hunting Stamp Act of 1934 and its subsequent amendments in 1935. The Stamp Act provided funding for wildlife refuges through the annual sale of stamps required of all waterfowl hunters. Norbeck's efforts in the 1935 amendments to the Act resulted in redirecting \$6 million of unexpended funds from the 1933 National Industrial Recovery Act to the Biological Survey to use for refuge land acquisition (See this article on Ding Darling for additional details http://publications.iowa.gov/29278/1/Iowa_Conservationist_1983_V42_N10.pdf). Duck Stamp dollars along with the \$6 million and another \$5 million from President Franklin Roosevelt's New Deal (at

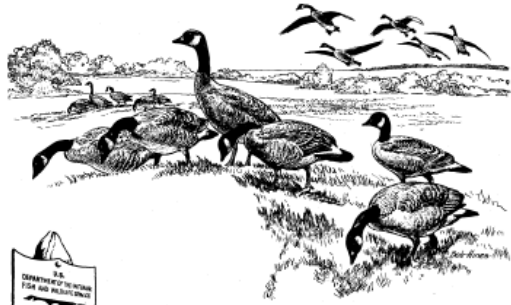
	Ding Darling's urging) set the stage for major acquisition of refuge lands during the mid- to late-1930s for the express purpose of restoring our nation's waterfowl.
1935	Refuge Revenue Sharing Act enacted: The Act compensates counties for refuge acquisition by sharing 25% of refuge receipts for use in maintaining roads and schools.
1935	National Wildlife Federation founded: The General Wildlife Federation is established to educate the American public about American wildlife and natural resources; the following year, the name was changed to the National Wildlife Federation. It is now the nation's largest grassroots conservation organization. https://www.nwf.org/About-Us/History
1935	Wilderness Society founded: A group of visionaries--Aldo Leopold, Robert Marshall, Robert Sterling Yard, Benton MacKaye, Ernest Oberholtzer, Harvey Broome, Bernard Frank and Harold C. Anderson--form The Wilderness Society to save some of America's dwindling wildlands. At the time, forests and other public lands were mainly seen as resources for logging, mining and other development. Setting out to conserve the wildest places is a revolutionary idea. Wild Places
1936	North American Wildlife Conference: The "North American Wildlife Conference: Wildlife Restoration and Conservation" called for by President Franklin D. Roosevelt is held. It included a number of references to wildlife refuges including a presentation by Ding Darling on "The Wildlife Crisis" (page 16-24) and J. Clark Salyer on "Practical Waterfowl Management" (page 584-599). https://archive.org/details/wildliferestorat00nortrich/page/n10/mode/1up
1937	Progress acquiring waterfowl refuges: The Bureau of Biological Surveys annual report (July 1, 1936 to July 1, 1937) described progress being made to acquire lands for waterfowl refuges. Among the highlights: 1) between July 1, 1933 and July 1, 1937 a total of 1,558,208 acres were purchased at an average cost of \$6.50 per acre; 2) the January 12, 1937 meeting of the Migratory Bird Conservation Commission approved purchase of an additional 134,655 acres at an average cost of \$10.46 per acre; 3) projects and accomplishments of CCC camps were described; 4) a total of 75 easement refuges (70 in North Dakota and 5 in Montana) encompassing nearly 119,000 acres were donated; 5) on July 1, 1936 there were 164 refuges encompassing 9.9 million acres and by July 1, 1937 there were 231 refuges encompassing 11.5 million acres (4.1 million acres in AK, HI, and PR); and 6) wildlife populations once lands were under protection were 3 to 5 times higher than before protected status.
1937	Regenerating wildlife lands: The Special Committee on Wildlife Resources created by a Senate resolution submits its report "Wildlife and the land: a story of regeneration" to Congress. This report focuses primarily on development and management of wildlife refuges and describes relationships between wildlife restoration and land rehabilitation and use. https://books.google.com/books?id=IDwXAAAIAAJ&pg=PA1&lpg=PA1&dq=wildlife+and+the+land+a+stor+y+of+regeneration&source=bl&ots=9UBoaAk9Ws&sig=ACfU3U1CMro3DH-ETuuO-q3tdaOZPtqvqg&hl=en&sa=X&ved=2ahUKEwiakeuio_bqAhXcmXIEHZtDCfQQ6AEwCnoECAoQAQ#v=onepage&q=wildlife%20and%20the%20land%20a%20story%20of%20regeneration&f=false
1937	Big game preserves: The Biological Survey publishes "Preserves and Ranges Maintained for Buffalo and Other Big Game". It describes the history and status of 11 game reservations that are now national wildlife refuges. Learn more at https://ia800409.us.archive.org/35/items/preservesrangesm95ruth/preservesrangesm95ruth.pdf
1937	Ducks Unlimited founded: During the 1930s called the Dust Bowl period, the country lost many wetlands and watched the number of waterfowl and other wildlife drop to dangerously low numbers. To preserve the waterfowl they loved, a small group of conservationists formed Ducks Unlimited About Ducks Unlimited
1937	Cooperating associations: The Department of the Interior Appropriations Act recognized the legal status of cooperating associations but it wasn't until the 1980s that such associations began to support National Wildlife Refuges.
1938	Biological Survey reorganizes: The Bureau of Biological Survey reorganizes to include establishing a Division of Wildlife Refuges which consolidates bird refuges and big-game preserves; J. Clark Salyer II was its Chief.

1939	<p>MBCC annual report summarizes Refuge System status: Table 2 from this report summarized acquisition of System lands as of June 30, 1939. At that time the System contained 13.5 million acres. Within that amount, 1.9 million acres had been acquired by purchase at an average cost of about \$6.50 per acre. See the report at https://ecos.fws.gov/ServCat/DownloadFile/164513?Reference=111324 The 1939 Biological Survey annual report indicated a total of 260 wildlife refuges encompassing 13, 530,160 acres were administered by the Biological Survey as of June 30,1939. They were categorized as: a) for migratory waterfowl including easement refuges – 139 refuges (1,613,632 acres), b) for other migratory birds – 63 refuges (951,812 acres), c) for wildlife in general – 17 refuges (4,298,128 acres), d) for nongame birds chiefly – 29 refuges (106,712 acres), and e) for big-game species – 12 refuges (6,559,876 acres).</p>
1939	<p>World War II: World War II begins and continues through 1945. The report of the FWS Director to the Secretary of the Interior for the fiscal year ending June 30, 1945 included the following paragraph about the war's impact on national wildlife refuges: "During the war years, the refuges have been operated on a strictly maintenance basis. With two thirds of all refuge personnel in the armed services, with construction at a standstill, and with maintenance reduced to the very minimum, water-control structures, patrol trails, buildings, etc., are deteriorating. An extensive program has been prepared for the rehabilitation of many of these developments, and for continuation and completion of the continental waterfowl refuge program."</p>
1939	<p>Directory of Biological Survey field activities: The "Directory of Field Activities of the Bureau of Biological Survey 1939" is published by the Department of Agriculture as Miscellaneous Publication 343. The Bureau contained 9 Divisions at the time, one of which was the Division of Wildlife Refuges whose responsibilities included the selection, planning, development, maintenance, patrol, and public use of lands primarily suited for wildlife, and the evaluation of the results of the program. Under the Division's supervision in July 1938 there were 248 wildlife refuges. This Division also cooperated extensively with other Federal agencies and State governments, educational institutions, sportsmen's organizations, conservation groups, and individuals, advising them on wildlife-management problems and, at their request, often directing and supervising their wildlife-conservation projects. The Division of Construction and C.C.C. Operations was in place primarily to coordinate activities of Civilian Conservation Corps camps operating on refuges. The Directory identified field offices of the Bureau nationwide. For refuges, it listed the name of the manager, the establishment authority and purpose of the refuge, and estimated acreage. https://archive.org/details/directoryoffield343unit/mode/2up</p>
1939	<p>Biological Survey to Interior Department: The Bureaus of Biological Survey and Fisheries are transferred from the Departments of Agriculture and Commerce, respectively, to the Department of the Interior under Reorganization Plan Number 11. As part of this reorganization, Secretary of the Interior Harold Ickes unsuccessfully lobbied President Franklin Roosevelt to transfer the Forest Service from Agriculture to Interior as well.</p>
1939	<p>A Book On Duck Shooting by Van Campen Heilner is published https://books.google.com/books?id=xU99CgAAQBAJ&printsec=frontcover&dq=Van+Campen+Heilner,+A+Book+On+Duck+Shooting+(Philadelphia:+Penn+Publishing+Company,+1939).&hl=en&newbks=1&newbks_redir=0&sa=X&ved=2ahUKEwjRh-K-5Lv2AhVNgnIEHXF8BncQ6AF6BAgGEAI#v=onepage&q&f=false. It chronicles the author's experiences hunting waterfowl at numerous locations in the U.S. and elsewhere. In an appendix, he assesses the status of duck clubs in the U.S. He estimated about 3,000 clubs existed at the time with a combined area of nearly 3 million acres under private ownership with the primary purpose of protecting habitats suitable for waterfowl hunting. Undoubtedly, the management of these clubs provided useful information for early managers of national wildlife refuges. In some cases, these hunt clubs would in time become national wildlife refuges. Examples of waterfowl hunt clubs that were donated to the FWS to form national wildlife refuges include Wertheim NWR in New York, Martin NWR in Maryland, and Cedar Point NWR in Ohio. For another reference on hunt clubs with emphasis on the eastern coast of Virginia see https://www.nps.gov/asis/learn/management/upload/AssateagueHuntingLodgesStudyFinalReport.pdf</p>
1940	<p>Status of wildlife in the U.S.: The Senate Special Committee on Wildlife Resources (Report 1203, 76th Congress, 3rd session) reports on progress in wildlife conservation since the Committee's establishment in 1930. An overview of wildlife conservation trends, laws, and legislation is given with emphasis on activities from 1930 to 1939. A lengthy report from the Biological Survey is included that describes establishment and management of national wildlife refuges. In 1930 there were 86 refuges with a</p>

	Learn more about Clarence Cottam and his work at https://sora.unm.edu/sites/default/files/journals/auk/v092n01/p0118-p0125.pdf
1946	FWS publishes history of American wildlife: Wildlife Leaflet 282 “History and Significance of American Wildlife” provides a general overview of wildlife in the U.S. and the impact over time of settlement by European immigrants. https://upload.wikimedia.org/wikipedia/commons/9/9d/History_and_significance_of_American_wildlife_%28IA_historysignifica282usfi%29.pdf
1947	“Conservation In Action” series: The FWS begins publishing the Conservation In Action Series. Rachel Carson is the chief editor and frequent author for these articles aimed at stimulating public interest in national wildlife refuges. https://www.fws.gov/rachelcarson/ The 12 volumes in the series (in order of publication) were Chincoteague a National Wildlife Refuge, Parker River a National Wildlife Refuge, Federal Duck Stamps and Their Place in Waterfowl Conservation, Mattamuskeet a National Wildlife Refuge, Guarding Our Wildlife Resources, Okefenokee a National Wildlife Refuge, Wheeler a National Wildlife Refuge, Bear River a National Wildlife Refuge, Stillwater Wildlife Management Area, Red Rock Lakes a National Wildlife Refuge for Trumpeter Swans, Aransas a National Wildlife Refuge, and Fur Seals of the Pribilof Islands https://babel.hathitrust.org/cgi/pt?id=osu.32435021857065&view=1up&seq=207&skin=2021 Learn more about Rachel Carson at https://www.youtube.com/watch?v=bTBrZY-fdtM
1947	Flyway model established: FWS administratively creates 4 flyways in the U.S. to better regulate migratory waterfowl hunting. The flyway concept also influenced where refuges were established so that they would provide for the entire life history needs of waterfowl.
1947	“Blue goose” symbol: Although originally drawn in the mid 1930’s by Ding Darling for the refuge boundary sign, the blue goose emblem became more widely known through the writing of Rachel Carson. The preamble to her Conservation in Action Series showed the "blue goose" refuge boundary sign along with the following narrative: "If you travel much in the wilder sections of our country, sooner or later you are likely to meet the sign of the flying goose-the emblem of the National Wildlife Refuges. You may meet it by the side of a road crossing miles of flat prairie in the Middle West, or in the hot deserts of the Southwest. You may meet it by some mountain lake, or as you push your boat through the winding salty creeks of a coastal marsh. Wherever you meet this sign, respect it. It means that the land behind the sign has been dedicated by the American people to preserving, for themselves and their children, as much of our native wildlife as can be retained along with our modern civilization. Wild creatures, like men, must have a place to live. As civilization creates cities, builds highways, and drains marshes, it takes away, little by little, the land that is suitable for wildlife. And as their space for living dwindles, the wildlife populations themselves decline. Refuges resist this trend by saving some areas from encroachment, and by preserving in them, or restoring where necessary, the conditions that wild things need in order to live." This language has since been quoted in a number of other refuge publications through the years. For a chronology of FWS signage see https://commons.wikimedia.org/wiki/File:Fish_and_Wildlife_Service_Sign_Chronology.jpg .
1948	Bob "Sea Otter" Jones: Jones becomes the first manager of Alaska Maritime NWR. He was a tireless protector of the wide variety of unique wildlife in the wild and rugged Aleutian Island chain and is especially well known for his efforts to conserve sea otters, to restore endangered Aleutian Canada geese through removal of foxes from nesting islands, and his opposition to nuclear bomb testing in the Aleutians. Learn more at https://erenow.net/modern/the-quiet-world-saving-alaskas-wilderness-kingdom-1879-1960/24.php and https://commons.wikimedia.org/w/index.php?title=File:Refuge_Update_November_December_2011.pdf&page=28
1948	Cannon net developed: Herb Dill and Howard Thornsberry, working at Swan Lake NWR in Missouri, invent a cannon propelled net for capturing a large number of geese in a single setting for purposes of banding them. This tool had widespread use throughout the country in years following as a means of capturing wildlife for various studies. The 1950 article “A Cannon-Projected Net Trap for Capturing Waterfowl” in the Journal of Wildlife Management describes the process (article available from JSTOR)

1948	Compatibility standard established: FWS appropriations act requires that recreational uses of refuge areas must be compatible with the primary purposes of the refuge (this requirement guides management and is affirmed in the 1962 Refuge Recreation Act.)
1948	Directory of National Wildlife Refuges: FWS publishes Wildlife Leaflet 299 which lists the name of refuges, the name of the associated manager and the address. This leaflet included about 110 of the 291 national wildlife refuges which had personnel assigned to administer and maintain them. https://upload.wikimedia.org/wikipedia/commons/3/33/Directory_of_National_Wildlife_Refuges_%28A_directory_of_natio299saly%29.pdf
1949	Duck Stamp Act amended: The Migratory Bird Hunting Stamp Act is amended, increasing the stamp fee from \$1 to \$2 while also allowing up to 25% of the area of "inviolate sanctuary" refuges to be designated as "wildlife management areas" upon which public waterfowl hunting is allowed.
1949	Leopold's land ethic: "A Sand County Almanac" by naturalist and former Forest Service employee Aldo Leopold is published. One of the most influential works about conservation ever written, the book eloquently argues the need for a "land ethic" through which humans embrace a more respectful, harmonious relationship with the natural world. "We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect." Leopold's land ethic continues to have a major impact on management of the Refuge System. Learn more at The Land Ethic and https://commons.wikimedia.org/wiki/File:Leopold%27s_Land_Ethic.pdf .
1951	The Nature Conservancy founded: The Nature Conservancy is incorporated by its predecessor, The Ecologist's Union. By the 1990s the Conservancy will own and manage the largest network of private nature reserves in the world. https://www.nature.org/en-us/about-us/who-we-are/our-history/
1951	Bibliography of articles about refuges: Wildlife leaflet 334 is published. Compiled by Philip Dumont, it assembles a list of articles and publications related to the Refuge System between 1903 and 1951. https://archive.org/details/nationalwildlife334dumo/mode/2up
1951	First collection of Refuge System visitation: This is the first year that Refuge System visitation figures were systematically gathered. It was estimated that there were 3.4 million visits to refuges consisting of 0.2 million hunting visits, 1.3 million fishing visits, and 1.9 million visits categorized as "miscellaneous use". As of June 30, 1951, there were 280 National Wildlife Refuges (and other units) containing 17.25 million acres.
1952	Origin of FWS shoulder patch: FWS personnel in Alaska began wearing shoulder patches with jumping salmon and flying Canada goose (the BSW adopted the patch officially in 1961). Learn more at https://commons.wikimedia.org/wiki/File:Fish_and_Wildlife_Service_Logo_Patch_Chronology.jpg
1953	First publication to encourage refuge visits: Refuge Leaflet #1 "Visiting National Wildlife Refuges" is published VISITING NATIONAL WILDLIFE REFUGES . This, the first known publication encouraging visitation to refuges, highlighted the Refuge System including a few of the more iconic refuges to visit. It included a map with 73 refuges recommended for visitation and indicated 110 refuges had a full-time manager. In the 1950s and 1960s, Refuge Leaflets were published either on an FWS Region basis or for individual refuges. See examples here https://babel.hathitrust.org/cgi/pt?id=uc1.\$b407655&view=1up&seq=7&skin=2021 . These leaflets were precursors to the color brochures for individual refuges that were printed especially during the 1970s to 1990s.

VISITING NATIONAL WILDLIFE REFUGES



IF YOU TRAVEL MUCH in the wilder sections of our country, sooner or later you are likely to meet the sign of the flying goose—the emblem of the National Wildlife Refuge.

You may meet it by the side of a road crossing miles of flat prairie in the Middle West, or in the hot deserts of the Southwest. You may meet it by some mountain lake, or as you push your boat through the winding sily creeks of a coastal marsh.

Wherever you meet this sign, respect it. It means that the land behind the sign has been dedicated by the American people to preserving, for themselves and their children, as much of our native wildlife as can be retained along with our modern civilization.

Wild creatures, like men, must have a place to live. As civilization creates cities, builds highways, and drains marshes, it takes away, little by little, the land that is suitable for wildlife. And as their space for living dwindles, the wildlife populations themselves decline. Refuges resist this trend by saving some areas from encroachment, and by preserving in them, or restoring where necessary, the conditions that wild things need in order to live.

UNITED STATES
DEPARTMENT OF THE INTERIOR
Douglas McKay, Secretary
FISH AND WILDLIFE SERVICE
John L. Pefley, Director
REFUGE LEAFLET 1



Refuge Leaflet #1, published in 1953, was the first national publication by the FWS encouraging visitation to national wildlife refuges (cover page at left). This marked the beginning of a turning point in the history of the National Wildlife Refuge System, away from a predominant sentiment of keeping people out of refuges and towards a future where appropriate public enjoyment of refuge lands and waters is a critical public benefit that the System can provide while also recognizing the need to balance wildlife needs against the impacts of recreation. (Some of the Refuge Leaflets published mostly in the 1950s and 1960s may be viewed at

<https://babel.hathitrust.org/cgi/pt?id=coo.31924071878742&view=1up&seq=5.>)



Snow geese at Sacramento NWR, CA

Era #4: A LOOSE COLLECTION BEGINS TO EMERGE AS A SYSTEM (1954-1979)

This era marks 2 and 1/2 decades (decades 7 to 8 and 1/2) of the National Wildlife Refuge System. During these 2 and 1/2 decades the U.S. population grew from 160 (35% rural) to 225 (26% rural) million. The nation continued to shift to a more urban distribution, and with it, increasing industry and reliance on technology and the world of chemicals. But pollution was going on unchecked especially early on in this era and it was becoming painfully obvious that people were dirtying their own nest. In addition to human health and safety concerns, it was being realized that many species of fish, wildlife, and plants would be lost forever if something didn't change.

Rachel Carson in her 1962 book "Silent Spring" drew attention to the insidious effects of insecticides and assorted other chemicals that threatened to wipe out bird life if we continued to use them. Carson's concerns were shared by many others and environmental awareness was at a high point during this era as evidenced by numerous laws passed during this time: the Wilderness Preservation Act in 1966, the Endangered Species Act in 1966, the Wild and Scenic Rivers Act in 1968, the National Environmental Policy Act and the Clean Air Act in 1970, and the Clean Water Act in 1972. Earth Day began in 1972 as a way to heighten awareness of our reliance on the earth's natural resources.



This photograph of the earth taken by Apollo 8 astronauts in 1968 had a major impact on people's thinking about the earth. It prompted a sense of just how unique and how fragile earth itself is and influenced the environmental movement in the U.S. (Wikimedia, Apollo 8 photo by crewmember Bill Anders)

Support for expansion of national wildlife refuges continued to be strong as evidenced by the 1961 Wetlands Loan Act and the 1964 Land and Water Conservation Fund which provided additional funds beyond Duck Stamp dollars to acquire lands. With this era of increasing environmental awareness and concern, the focus of new national wildlife refuges would broaden beyond migratory birds to extend to endangered species, biodiversity, unique habitats, and urban refuges.

It wasn't until half a century after the first refuge was established, as development continued to drastically outpace conservation, that Congress recognized the need to create a legislative framework for protecting the nation's wildlife resources. First, Congress passed the Fish and Wildlife Act of 1956. It created a comprehensive national fish and wildlife policy that among other provisions gave authority to acquire and develop lands for national wildlife refuges. Funds to implement this authority were not immediately forthcoming. Federal land acquisition during the 1950s could not keep pace with the high rate of drainage (primarily due to intensive agricultural development) of waterfowl breeding habitat in the Prairie Pothole Region. To remedy this, Congress amended the Duck Stamp Act in 1958 and authorized the small wetland program to protect waterfowl habitat. This opened the door to major improvements in waterfowl and wetland conservation in the Prairie Pothole area by authorizing the purchase of wetlands and grasslands called Waterfowl Production Areas, and by authorizing protective easements.

The combination of: 1) building the Interstate Highway System and associated state and local highways; 2) the nearly universal access to automobiles (in 1941, half of American families had access to an automobile; by 1970 there was one car for every 2 adults in the nation); and 3) the depletion of wildlife in many areas increased public interest in visiting wildlife refuges during this era. Refuge Leaflet #1 "Visiting National Wildlife Refuges", published in 1951 was the first FWS publication to encourage visitation to refuges. It highlighted the Refuge System including a few of the more iconic refuges to visit, included a map with 73 refuges recommended for visitation and also mentioned that 110 refuges had a full-time manager. Also in 1951, visitation information for refuges first began being collected. Wildlife Leaflet 420 in 1960 reported refuge visitation from 1951 to 1959. During this 8-year period, total annual visitation grew from 3.4 to 9.9 million; nearly tripling during these years. Recognizing new public demands for recreation, Congress passed the Refuge Recreation Act of 1962 to authorize the recreational use of refuges; the law required that permitted recreation be compatible with refuge purposes and that it be allowed only when funds are available to manage the activity. Visitation continued to expand and by the end of this era in 1979 the System hosted about 23 million visitors per year. This was a time of transition for refuge field managers; from keeping people out to inviting them in to enjoy these lands and their wildlife.

Prior to the early 1970's, the predominant thinking was that all national wildlife refuges would be established in rural or even remote areas and would avoid being established near major cities. However, as our nation's citizens were increasingly urbanized and at the same time increasingly interested in visiting "natural areas", the Refuge System began to establish "urban refuges". Refuges such as John Heinz NWR at Tinicum (established in 1972 in Philadelphia), Don Edwards San Francisco Bay NWR (established in 1972 in San Francisco) and Minnesota Valley NWR (established in Twin Cities in 1976) proved popular and opened the door for other refuges to be established in more urban locations.

The Land and Water Conservation Fund Act enacted in 1965 provided new funding for local, state, and federal acquisition of lands for conservation and recreation. The program uses

revenues from offshore oil and gas drilling in public waters to purchase land and easements for conservation and public recreation. It provided a major funding boost for acquisition of refuges.

The law of perhaps greatest significance to management of wildlife refuges during this era was the National Wildlife Refuge System Administration Act of 1966. Unlike other federal land agencies such as the National Park Service and U.S. Forest Service, the National Wildlife Refuge System didn't start out as a system; rather it was a patchwork of lands born out of a need to protect imperiled wildlife. The National Wildlife Refuge System Administration Act moved the assemblage of conservation lands closer to being a system by providing guidelines and directives for administration and management of all areas in the Refuge System to include wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife management areas, and waterfowl production areas.

The wave of public opinion in the 1960s resulted in a much-expanded view of the need to care for our nation's environment. Also, the 1964 Wilderness Act established the National Wilderness Preservation System. The Wilderness Act states that these Congressionally-designated areas "... be administered for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness." Since its passage, Congress designated more than 20 million acres of Wilderness (19% of the nation's total Wilderness acreage) on units of the Refuge System.

The Endangered Species Act of 1973 authorized the establishment of new refuges for the express purpose of protecting and restoring endangered species and also redirected management emphasis on some refuges. About 60 refuges have been established specifically for endangered species. The Endangered Species Act is considered the world's foremost law to protect species faced with extinction and the Refuge System has had much success in protection and recovery efforts. The System has proven to be well suited to conservation of imperiled species by providing secure habitats, and by providing fertile ground for recovery efforts including both habitat management and reintroduction programs.



Severe declines in iconic birds such as the American bald eagle (Wikimedia, photo by Paul Friel) and the whooping crane helped fuel giving greater attention to conserving endangered wildlife. The Refuge System has played and continues to play an important role in the protection and restoration of endangered species.

Life must become more than the wants and needs of humans. We are not on this earth alone. If the manatee goes into extinction because the needs of humans became more important, then we will have taken another step backward toward our own demise. Extinction is forever and for all. - Dr Harvey Barnett, Florida Manatee Conservationist

(this inscription is on an underwater manatee statue at Crystal River NWR, one of a number of refuges established specifically to conserve and restore endangered species)

In 1975, the National Wildlife Refuge Association (NWRA) was established. Its mission is to conserve America's wildlife heritage for future generations through strategic programs that protect and enhance the National Wildlife Refuge System and the landscapes beyond its boundaries. While other non-government organizations have supported the Refuge System throughout its history, the NWRA is the leading national level nonprofit organization that focuses exclusively on the protection and promotion of the Refuge System. Refuge Association representatives have advocated for the Refuge System over the many years since establishment of the organization and have been successful in many of those efforts. Frequently, the Refuge Association has been the first to become aware of an emerging issue and has acted as a catalyst to inform other conservation organizations of the need to speak out.

From 1903 to 1976, the Biological Survey and then the Fish and Wildlife Service had administrative authority to modify and dispose of refuges. In 1975, Philip Dumont in the FWS Division of Wildlife Refuges and Henry Thomas in the FWS Division of Realty completed an unpublished white paper "Modification of National Wildlife Refuges" that documents changes in wildlife refuges in the first 72 years of the Refuge System. During those years, quite a number of refuges were combined, modified, or abandoned and this paper lists those changes. Legislation in 1976 required approval of Congress for these types of changes in subsequent years. As a result, very few refuges have been disposed of since that time.

The Bicentennial Land Heritage Program began in 1977. Championed by President Gerald Ford, it commemorated our nation's bicentennial by investing in facilities on our public lands. The five-year program (\$180 million over the 5 years FY 1977 – FY 1981) provided much needed construction funding for the Refuge System to improve water management structures, build visitor and administrative buildings, and improve roads and visitor facilities.

The FWS Fire Management Program was formally instituted in 1978 when the position of Fire Management Coordinator was filled making the FWS Fire Management Program the youngest of the five federal land management agencies. The following year, the FWS joined the Boise Interagency Fire Center which had been formed in 1965 when the Forest Service, Bureau of Land Management, and National Weather Service saw the need to work together to reduce duplication of services, cut costs, and coordinate national fire planning and operations.

During this 2 and 1/2 decade era, the Refuge System diversified and doubled in acreage. 98 new refuges were established as 14.3 million acres in Alaska and 1.3 million acres in the rest of the country became part of the System. Passage of the Land and Water Conservation Fund Act brought new funding for land acquisition. Increasing emphasis was placed on threatened and

endangered species and unique ecosystems as new refuges were acquired. In addition, amendment to the Duck Stamp Act during the era enabled acquisition of 1.6 million acres of waterfowl production areas and wetland easements. By the end of this era, this collection of conservation lands was continuing to grow in importance and was becoming a more comprehensive collection of lands. By the end of this era in 1979, the Refuge System included 427 units (398 refuges and ranges, and 29 wetland management districts [135 waterfowl production area counties]) in 49 states and three territories. It protected 34.5 million acres of lands and waters, including 12.1 million acres in the lower 48 states. Public visitation to the System continued to grow at a rapid rate, increasing from about 5 million in 1953 to 23 million visits per year in 1979.

Table 4. Timeline for ERA #4: A loose collection begins to emerge as a system (1954-1979)

Overview: This era marks 2 and 1/2 decades (decades 7 to 8 and 1/2) of the Refuge System. During this time the U.S. population grew from 160 (35% rural) to 225 (26% rural) million. This was a time of environmental awakening with numerous laws enacted to protect the environment. Of particular importance to the Refuge System was the passage of the Endangered Species Act. Over time 59 refuges would be established specifically for threatened and endangered species. Also of importance during this era: 1) the National Wildlife Refuge System Administration Act of 1966 provided guidelines for managing wildlife refuges and 2) the Land and Water Conservation Fund Act of 1965 provided new funds to acquire land. 56 new refuges totaling 9.2 million acres in Alaska and 1.6 million acres in the rest of the country became part of the System. The 1958 amendments to the Duck Stamp Act authorized the small wetland program which opened the door to major improvements in waterfowl and wetland conservation. The Wetlands Loan Act of 1961 and its amendments provided a major source of funds to acquire waterfowl habitats. At the end of the era in 1979, the System protected 34.5 million acres (22.3 million in Alaska) that included 398 refuges and small wetland acquisition in 138 counties (1.6 million acres). The American public "discovered" refuges with annual visitation expanding from about 5 million to 23 million visitors per year during the era.

1953	<p>Budget stats: The 1955 budget request for FWS indicated that in 1953 the budget for mammal and bird reservations was \$1.8 million out of a total FWS budget of \$7.6 million. No breakout of FTEs by program was provided. 1,240 FTEs were indicated for the entire agency at an average salary of \$4,564/yr. If FTEs are proportional to budgets (1.8/7.6), then there would have been about 294 FTEs devoted to wildlife reservations. (Refuge Leaflet #1 published in 1953 indicated that 110 refuges had a full-time manager.) At this time, there were 300 reservations in 42 states and three territories; a total of 17.6 million acres of lands and waters were under protection, including 9.6 million acres in the lower 48 states.</p>
1954	<p>Concerns over use of Duck Stamp funds: Concerns were raised about how Duck Stamp funds were being used with some sporting groups feeling that too much of the funding was going to development and management of refuges (about 85%) and not enough to land acquisition (about 15%). In a Congressional hearing on the topic, FWS Director John Farley provided a history of the Refuge System with emphasis on use of funds since passage of the Duck Stamp Act in 1934. Considerable historical detail is in the hearing record (Farley's testimony begins on page 71) https://play.google.com/books/reader?id=mbGi6JsF8gUC&pg=GBS.PA70&hl=en</p>
1955	<p>List of refuges published: FWS publishes Wildlife Leaflet 372 that listed the names, location, year established, acreage, and primary wildlife species benefited for each of the 264 refuges at that time. Refuges in aggregate contained 17,472,182 acres. Of these, 247 (9,546,646 acres) were in the U.S. and 17 (7,925,536 acres) were in the territories of Alaska, Hawaii, and Puerto Rico. https://upload.wikimedia.org/wikipedia/commons/f/f6/List_of_national_wildlife_refuges_-_1955_%28IA_listofnationalwi372usfi%29.pdf</p>
1955	<p>"Duck Stamps and Wildlife Refuges" published: This FWS document, published as Circular 37, tells the story of the Duck Stamp and the need to manage refuges, to restore habitats through development of water management facilities and to provide headquarters buildings and visitor access points. Fishery circular</p>
1955	<p>First national survey of hunting and fishing: Contracted by the FWS, this survey finds 20.8 million fishermen and 11.8 million hunters. Together, they spent \$2.85 billion for their sports and were afield 567 million days in the year. Report available at https://babel.hathitrust.org/cgi/pt?id=mdp.39015081991708&view=1up&seq=5&skin=2021</p>

1956	FWS divided into 2 bureaus: The Fish and Wildlife Service is renamed the "U.S. Fish and Wildlife Service" with two bureaus, the Bureau of Sports Fisheries and Wildlife and the Bureau of Commercial Fisheries. Management of wildlife refuges was placed under the former.
1956	Fish and Wildlife Act of 1956 enacted: As amended, this law provided an overall national fish and wildlife policy and authorizes the Secretary of the Interior to take steps for the development, management, advancement, conservation, and protection of fisheries and wildlife resources through research, acquisition of refuge lands, development of existing facilities, and other means.
1956	Carson's "Sense of Wonder" published: "The Sense of Wonder" by Rachel Carson is published as a magazine article ("Help Your Child to Wonder") and details Carson's philosophy that adults need to nurture a child's inborn sense of wonder about the natural world. The article was expanded and published posthumously as a book in 1965. A popular quote from the article and book is "There is symbolic as well as actual beauty in the migration of the birds, the ebb and flow of the tides, the folded bud ready for the spring. There is something infinitely healing in the repeated refrains of nature—the assurance that dawn comes after night, and spring after the winter." PBS completed a documentary about Carson, entitled "A Sense of Wonder" in 2010. Rachel Carson NWR in Maine was named in her honor in 1969.
1956	The Muries and wild Alaska: Olaus and Mardy Murie along with other field biologists traveled to the upper Sheenjek River on the south slope of the Brooks Range, inside what is now the Arctic NWR in Alaska. That trip began the campaign to protect the area as a wildlife refuge. The couple recruited former U.S. Supreme Court Justice William Douglas to help persuade President Eisenhower to set aside 8 million acres as the Arctic National Wildlife Range in 1960. The work and advocacy of the Muries were also important components leading to passage of the Wilderness Act in 1964 and the Alaska National Interest Lands Conservation Act in 1980. Olaus and Mardy Murie https://www.youtube.com/watch?v=8iBEHPmC02I https://commons.wikimedia.org/wiki/File:Murie_Symposium_Proceedings.pdf
1957	Refuge Manual updated: A revised Refuge Field Manual is issued, providing refuge managers and employees with the first comprehensive update of policies since 1942, including guidance on public relations that encourages "missionary work" with the public to minimize the potential of problems becoming critical issues.
1957	Refuge System Stats: There were 270 refuges in the system at this time. There were 479 permanent field employees in place and the annual budget was \$5 million. There were 8.7 million visitors to refuges.
1958	Duck Stamp Act amended: The 1934 Migratory Bird Conservation Stamp Act is amended, authorizing an increase in the fee to \$3, with the portion of "inviolate sanctuary" refuges that could be opened to hunting increased to 40%. The amendments also required that all Duck Stamp revenues be used solely for land acquisition (use of funds to improve or manage refuges no longer allowed). The amendment also permits the Secretary of the Interior to use Duck Stamp proceeds to purchase not only "inviolate sanctuary" refuges, but also "waterfowl production area" refuges which were not subject to the 40% limit.
1958	Small wetlands acquisition program: The amendment of the Migratory Bird Conservation Stamp Act authorizing acquisition of wetlands as WPAs opened the door to one of the most aggressive acquisition campaigns in history; a race against drainage tile and ditches. Focused on the Prairie Pothole region of the Upper Midwest, by 2021, over 4.3 million acres of critical wetland habitats will be protected through this program. This equates to 23% of Refuge System acreage in the lower 48 states. Learn more at Waterfowl Production Areas
1959	AK and HI become states: Alaska and Hawaii were admitted to the U.S. as 49th and 50th states. Over time, these two states would contribute large areas to the Refuge System; Alaska adding large-scale world-class wilderness areas and Hawaii adding expansive marine areas along with unique Pacific island fish and wildlife habitats. Lands and waters of these two states (when including the island territories in the Pacific Ocean") comprise about 97% of the area of the present-day Refuge System.

1959	<p>First WPA acquired: The FWS purchased the first waterfowl production area (WPA) in Day County, SD. Named the McCarlson WPA after its former owner, this was the start of the small wetlands acquisition program, one of the most successful conservation efforts ever undertaken. This program allows habitat protection for nesting waterfowl throughout the Prairie Pothole region with attendant benefits to a wide array of other wildlife. WPAs are purchased with funds from the sale of Federal Duck Stamps and are open to the public for hunting and other wildlife-dependent activities.</p>
1960	<p>Arctic National Wildlife Range established: Secretary of Interior Fred Seaton, on authority delegated from the President, issues Public Land Order 2214 to establish the 8.9 million acre Arctic National Wildlife Range that in 1980 would be incorporated within the Arctic NWR America's Wildest Refuge: Discovering the Arctic National Wildlife Refuge Congressional hearings proposing legislative protection of the area had been held earlier in 1959 including testimony by conservationists Olaus and Mardy Murie (beginning on page 58) https://books.google.com/books?id=hWce_hLtzs8C&pg=PA355&lpg=PA355&dq=S.+1899,+A+Bill+to+Authorize+the+Establishment+of+the+Arctic+Wildlife+Range,+Alaska,+86th+Congress&source=bl&ots=n1qnxC4rMi&sig=ACfU3U0eqYLP0LEN7-4aaLn7RrDjJcng&hl=en&sa=X&ved=2ahUKEwiv4YT4n_rqAhVQhHIEHWVWAVsQ6AEwA3oECAkQAQ#v=onepage&q=S.%201899%2C%20A%20Bill%20to%20Authorize%20the%20Establishment%20of%20the%20Arctic%20Wildlife%20Range%2C%20Alaska%2C%2086th%20Congress&f=false</p>
1960	<p>Refuge visitation in the 1950s: FWS publishes the 1-page leaflet, "Wildlife Leaflet 420" that displays annual visits to refuges from 1951 when visitation information was first collected to 1959. During this 8-year period, hunting visits grew from 222,470 to 481,504; fishing visits grew from 1,309,362 to 3,185,342; and miscellaneous visits grew from 1,911,085 to 6,269,299. Total visitation grew from 3,442,917 to 9,936,145; nearly tripling during these years. https://babel.hathitrust.org/cgi/pt?id=mdp.39015007538757&view=1up&seq=3&skin=2021</p>
1961	<p>Crawford named 8th Refuge System Chief: Eugene Crawford was the 8th "Chief" of refuges, serving as Chief from 1961 to 1964. Born in Indianapolis, Indiana in 1911, his academic background included a BS in forestry from the University of Michigan in 1935 and an MS in wildlife from Oregon State in 1938. He was recruited by the wildlife program in 1935 as a biologist on the Seney NWR in MI. In 1938 he became manager of the Willapa NWR in WA and subsequently managed Lacreek NWR in SD, Theodore Roosevelt NWR in ND and Crab Orchard NWR in IL. He came to Washington, DC, in 1958 as Assistant Chief of the Branch of Wildlife Refuges working under J. Clark Salyer. He spent 22 months in the U.S. Navy during WWII where he was lieutenant senior grade on OSS assignment. His appointment as Chief of the Branch of Wildlife Refuges was within the Division of Wildlife which was composed of the branches of wildlife refuges, wildlife research, game management and enforcement, and predator and rodent control. Director of the FWS during his tenure was John L. Farley.</p>
1961	<p>"Directory of National Wildlife Refuges" published: This FWS published document provided the name, date established, acreage, and primary wildlife species for each of 277 National Wildlife Refuges which in the aggregate contained 17,317,610 acres as of June 30, 1960. Refuges were given a "class" designation with 210 (3,477,129 acres) "classed" as migratory bird refuges for waterfowl; 46 (3,716,972 acres) as general migratory bird refuges, including many colonial nesting areas; 2 (798 acres) as waterfowl production areas; 14 (5,518,533 acres) as big-game refuges; and 5 (4,604,178 acres) as game ranges. See the Directory at https://babel.hathitrust.org/cgi/pt?id=mdp.39015007538922&view=1up&seq=3&skin=2021</p>
1961	<p>Wetlands Loan Act enacted: This Act and its subsequent amendments provided \$200 million as an advance loan against Duck Stamp funds to accelerate purchase of lands to conserve migratory birds. This enabled an expanded effort to conserve waterfowl habitats throughout the nation. Much of this funding was used to acquire Waterfowl Production Areas in the Prairie Pothole region of the upper Midwest as they are critically important for waterfowl nesting.</p>
1962	<p>Refuge Recreation Act enacted: This law authorized public visitation to refuges whenever that recreation is compatible with refuge purposes and funds are available to manage the activity. Outside of the 1948 Appropriations Act and the 1958 Duck Stamp Act, this is the first Congressional recognition of public recreation being suitable for wildlife conservation areas.</p>

1962	<p>National Natural Landmarks established: The National Natural Landmarks program is established by the National Park Service to further recognition of outstanding natural and geologic features in the nation. Santa Ana NWR in Texas is believed to be the first refuge to be recognized (1966) as a National Natural Landmark. Of about 600 National Natural Landmarks in the nation today, 43 are on refuges. Learn more at National Natural Landmarks (US National Park Service)</p>
1962	<p>“Silent Spring” awakens the nation: Silent Spring by FWS aquatic biologist Rachel Carson exposes the harm caused by insecticides such as DDT. The book leads to the development of safer insecticides and to a 1972 ban on the sale of DDT in the U.S. More significantly, it heightens the awareness of ordinary people, who demand new legislation aimed at protecting the environment—a word that enters common parlance around this time. "We stand now where two roads diverge. But unlike the roads in Robert Frost's familiar poem, they are not equally fair. The road we have long been traveling is deceptively easy, a smooth superhighway on which we progress at great speed, but at its end lies disaster. The other fork of the road, the one "less traveled by" offers our last, our only chance to reach a destination that assures the preservation of our earth. The choice, after all, is ours to make." Rachel Carson, Silent Spring. Learn more at Rachel Carson, The Life and Legacy and https://commons.wikimedia.org/wiki/File:Rachel_Carson_Symposium.pdf.</p>
1963	<p>“Ducks at a Distance” published: "Ducks at a Distance: A Waterfowl Identification Guide" by Bob Hines is published by the FWS. Arguably the most popular publication ever produced by the FWS, Hine's illustrations provided a tool to help promote education of duck hunters as point systems were being instituted to establish bag limits for ducks based on species and sex of each duck taken. See the guide at Ducks at a Distance Waterfowl ID Guide</p>
1964	<p>Salyer retires: J. Clark Salyer II retires from the FWS after nearly 30 years of service. He received the Department of the Interior's Distinguished Service Award honoring his tireless efforts to build the National Wildlife Refuge System. Salyer is widely regarded as the "Father of the Refuge System." In 1967 the Lower Souris NWR in North Dakota was re-named the J Clark Salyer NWR in his honor.</p>
1964	<p>Gillett named 9th Refuge System Chief: Francis G. (Fran) Gillett was the 9th “Chief” of refuges. He was Chief of Refuge Management for 2 years before his retirement in 1966 after a 30-year career with the FWS. Prior to becoming Chief of Refuges, he served at several refuges in the Twin Cities Region, then as Refuge Supervisor in the Twin Cities (1947 to 1958), and Chief of the Wildlife Division for the Southeast Region in Atlanta (1959 to 1963). As Refuge Chief, one of his main objectives was to put refuge management on a professional footing by requiring college degrees in wildlife management for field station managers. He also championed moving personnel from refuge to refuge to broaden the experience of the workforce and encourage a more systematic approach to overseeing refuges. Director of the FWS during his tenure was Daniel Hugo Janzen.</p>
1964	<p>Land and Water Conservation Act enacted: Congress passes the Land and Water Conservation Act providing funding for local, state, and Federal acquisition of lands for conservation and recreational uses. These funds, along with funds from the sale of Duck Stamps, are the predominant funding source for purchases of lands to be added to the Refuge System.</p>
1964	<p>Wilderness Preservation Act enacted: This Act establishes the National Wilderness Preservation System. The system can grant wilderness areas protected status that excludes them from mining, timber cutting, and other operations. Today the Refuge System has over 20 million acres of designated Wilderness, mostly in Alaska Wilderness Connect; this is about one fifth of the entire Wilderness acreage in the country. Key proponents for a national wilderness preservation system included Howard Zahniser https://winapps.umn.edu/winapps/media2/wilderness/toolboxes/documents/awareness/Howard%20Zahniser%20writing%20-%20Wilderness%20Forever.pdf, Mardy and Olaus Murie https://wilderness.net/learn-about-wilderness/olaus-mardy-murie.php, and Bob Marshall People. For a perspective by former FWS Director Jamie Rappaport Clark on the value of Wilderness to the Refuge System see https://medium.com/wild-without-end/the-value-of-wilderness-to-the-u-s-national-wildlife-refuge-system-bf43f13ca751</p>

1964	<p>"Waterfowl Tomorrow" published: This FWS published book (edited by Joseph Linduska with illustrations by Bob Hines) was the classic treatment of the status and outlook of waterfowl management in North America. It includes a number of references to the Refuge System including a chapter (pages 497-509) on Wildlife Refuges by J. Clark Salyer and Francis G. Gillett that emphasizes the work of refuges to conserve and manage waterfowl especially during the 1940s and 1950s. Learn more at https://archive.org/details/waterfowltomorro00unit/page/n9/mode/2up</p>
1965	<p>First Refuge Academy: The first Refuge Manager's Training Academy is held at Arden Hills, MN. 62 students spent 5 weeks on issues ranging from search-and-rescue management to correspondence writing. From that class came future assistant and regional directors for the FWS and 2 refuge division chiefs. Following academies lasted 6 weeks and continued to be held annually through 1969.</p>
1965	<p>Refuge System stats: "National Wildlife Refuges 1965" is issued by the FWS as Resource Publication 1 https://upload.wikimedia.org/wikipedia/commons/3/37/National_wildlife_refuges_1965_-_DPLA_-_cd11fc9196535fbfae74fbe2ce12a158.pdf. This illustrated report gave the status of the Refuge System with refuges categorized as follows: 1) Migratory bird refuges primarily for waterfowl (229 units, an aggregate of 3,612,430 acres); 2) Migratory bird refuges primarily for other migratory birds (46 units, an aggregate of 3,708,590 acres); 3) Big game refuges established by Congress or purchase (14 units, an aggregate of 5,190,995 acres); 4) Game ranges withdrawn from the public domain (5 units, an aggregate of 4,604,258 acres); 5) Alaska wildlife ranges (3 units, an aggregate of 11,185,016 acres); and 6) Waterfowl production areas in ND, SD, MN, and NE (153,152 acres). A total of 1.25 billion waterfowl use days were reported in 1964 for refuges outside Alaska. Examples of peak waterfowl numbers were given with the highest being 3,455,000 at the Klamath Basin refuges in CA and OR. Highlights of threatened species conservation on refuges are provided. The report emphasized that development and management of refuges is vital to achieving wildlife benefits. A total of 14 million recreational visits was reported for 1964. The annual budget for field operations was \$9 million.</p>
1965	<p>"Sign of the Flying Goose" published: "The Sign of the Flying Goose: The Story of our National Wildlife Refuges" by George Laycock is published. It told the grim story of vanishing species – key deer, bison, trumpeter swans and many others – and the plucky saga of redemption, for some, in national wildlife refuges. Interior Secretary Stewart Udall starts the forward to the book with "Our National Wildlife Refuges have been dedicated to the inspiring proposition that Americans should respect and protect all living creatures - and accord them a place in our scheme of values."</p>
1966	<p>Refuge System Administration Act enacted: The National Wildlife Refuge System Administration Act formally establishes the National Wildlife Refuge System. The law consolidates various authorities for managing areas administered by the Secretary of the Interior for the purpose of fish and wildlife conservation. The Act authorizes the Secretary to permit the use of refuges whenever it is determined that such a use is compatible with the purposes for which the area was established and reaffirms the 1962 Recreation Act requirements for compatibility and availability of sufficient funds.</p>
1966	<p>Endangered Species Preservation Act enacted: This the nation's first law to protect endangered species, permits the government to take land into federal custody in order to protect "selected species of native fish and wildlife." It does not ban, however, the killing of endangered species, except within national wildlife refuges. This Act and its subsequent amendments had major impacts on the Refuge System in terms of both management and acquisition of refuges. In subsequent years, over 59 refuges would be established specifically for threatened or endangered species. Learn more at List of National Wildlife Refuges established for endangered species</p>
1967	<p>Scott named 10th Refuge System Chief: Robert Falcon (Bob) Scott was the 10th Chief of the Refuge System and the first Chief to enter the position after Congress had officially recognized this collection of wildlife lands as a system (Refuge System Administration Act of 1966). Scott was born in Chicago in 1922, but grew up in rural New England. He had a BS in Forestry from the University of Maine. He served in the army during WWII and was stationed in the Aleutian Islands in Alaska where he met his wife Rita who was in the Red Cross. After the war, while working on his MS degree and a two-year fellowship at Oregon State College, he and Rita were the sole residents of Eliza Island off the</p>

	<p>south tip of Lummi Island. Before being appointed as Chief of the Division of Wildlife Refuges (1967), his work experience included leader of the Cooperative Wildlife Research Unit at the University of Alaska, wildlife biologist at Patuxent Research Center, MD, and position(s?) with the National Marine Fisheries Service. During his 4-year tenure as Chief of refuges (1967-1971), Scott focused on using systems analysis to develop measures and goals that would enhance the ability to manage the various refuges as a system and to make decisions to inform allocation of scarce funding and staffing. After retiring from the Interior Department, he moved to Gland, Switzerland as Chief Executive Officer for the Survival Services Commission, part of the International Union for the Conservation of Nature and Natural Resources. Directors of the FWS during his tenure as Chief of Wildlife Refuges were Daniel Hugo Janzen (1967–1970) and John S. Gottschalk (1971).</p>
1968	<p>“Earthrise” image from space: The iconic photograph of the earth taken from space by Apollo 8 astronauts has been termed "earthrise" or "blue marble" and has had a major impact on people's thinking about the earth. It prompted a sense of just how unique and how fragile earth itself is and influenced the environmental movement in the U.S. in the years following. Learn more at Earthrise: 50 Years Ago Today, Apollo 8 Changed Humanity's Vision of Earth Forever</p>
1968	<p>First Wilderness area in Refuge System: The first Wilderness Area managed by the FWS (and the first within the Department of the Interior) is designated by an act of Congress at the Great Swamp NWR, New Jersey. Learn more at Great Swamp National Wildlife Refuge About Us</p>
1968	<p>Wild and Scenic Rivers Act enacted: The National Wild and Scenic Rivers Act establishes a federal system for protecting pristine, free-flowing rivers from development. Today there are 13 designated Wild and Scenic Rivers within the Refuge System. Learn more about Wild and Scenic Rivers at A National System and for a video commemorating 50 years of protecting Wild and Scenic Rivers see https://www.youtube.com/watch?v=SBCPiJDq2AU</p>
1968	<p>National Trails Act enacted: The National Trails System Act of 1968 authorized creation of a national system of trails comprised of National Recreation Trails, National Scenic Trails and National Historic Trails. Today there are about 1,300 trails in the System with 74 occurring on national wildlife refuges. Learn more at National Recreation Trails</p>
1968	<p>Secretary Udall’s Advisory Board report: Secretary of Interior Udall's Advisory Board on Wildlife Management (A. Starker Leopold, Clarence Cottam, Ian McT. Cowan, Ira N. Gabrielson, and Thomas L. Kimball) reports on the Refuge System stating it 'still lacks a clear statement of policy . . . [on its purposes and future]." Among its recommendations: 1) continue to acquire habitat for waterfowl to include breeding, migration, and overwintering areas; 2) additional refuges should be acquired for non-waterfowl, particularly threatened and endangered species; 3) the Refuge System should continuously be appraised for possible additions or deletions; 4) general appropriations should be used for acquisition to augment Duck Stamp funds; 5) central administrative authority of the Division of Refuges should be strengthened; 6) refuge management should include preservation and restoration of natural ecosystems; 7) refuges should be managed to spread waterfowl throughout the flyways (as opposed to major concentrations at a small number of locations); 8) wildlife oriented uses are to be encouraged but must be managed in a way that is compatible with the primary purpose of refuges and avoiding undue disturbance of fish and wildlife; and 9) refuges should be used as research areas by qualified scientists and naturalists. https://books.google.com/books/content?id=bwzKVgxAVqkC&pg=PP56&img=1&zoom=3&hl=en&bul=1&sig=ACfU3U30rDRmS29WPWHI77Fnuy-yiIVm6A&w=1025. As part of the response to this report, the FWS developed new objectives for the Refuge System in 1970; a general overview of these objectives is given at https://babel.hathitrust.org/cgi/pt?id=mdp.39015095241710&view=1up&seq=3&skin=2021</p>
1968	<p>“Wild Sanctuaries” published: “Wild sanctuaries: Our national wildlife refuges - a heritage restored” by Robert W. Murphy is published.</p>
1969	<p>Endangered species protections expanded: The Endangered Species Conservation Act expands the protection of the 1966 act to some invertebrates and introduces a new category: threatened species—those that are "threatened with worldwide extinction."</p>

1969	NEPA enacted: The National Environmental Policy Act (NEPA) is enacted which requires environmental impact analysis and consideration for any federal action or permitted activity that may have a significant impact on the environment.
1970	Commercial Fisheries transferred to Commerce Dept.: The Bureau of Commercial Fisheries is abolished and its functions are moved to the newly established National Marine Fisheries Service in the Department of Commerce. The Bureau of Sport Fisheries and Wildlife remains in the Department of the Interior and retains responsibility for managing national wildlife refuges.
1970	EPA established: President Nixon forms the Environmental Protection Agency (EPA) to enforce laws that protect the environment and public health. William D. Ruckelshaus is sworn in as the agency's first administrator.
1970	Clean Air Act enacted: This law regulates air emissions and gives EPA the power to set air quality standards. Amendments to the act in 1977 and 1990 raise standards even higher, in order to counter problems like acid rain and ozone depletion. Air quality protections are important to the Refuge System and today air quality monitoring is conducted at designated Class I Wilderness areas. Learn more at https://www.fws.gov/program/air-quality
1970	First Earth Day: On April 22 Earth has its first official birthday celebration in the United States. More than 20 million people marched, demonstrated, and attended teach-ins on environmental topics. "Earth Day" has been annually observed since that time.
1970	League of Conservation Voters founded: A bipartisan political action committee, this non-government organization publishes a scorecard of House and Senate member votes for every Congress.
1970	“One-Third of the Nation’s Land” published: P.L. 88-606, enacted in 1964, established a Public Lands Law Review Commission tasked with conducting a comprehensive review of the ownership and management of public lands. This report resulted from their work and provides 137 recommendations on management of public lands including when and under what conditions they should be retained or disposed of. Learn more at https://www.google.com/books/edition/One_Third_of_the_Nation_s_Land/SroLk_PhstwC?hl=en
1971	Refuge System stats: As of June 30, 1971, the Refuge System consisted of 30.4 million acres in 332 units with a field staff of 912 and a total operational budget of \$18.9 million. A little over 1 million acres of the 30.4 was in the Small Wetland Program in the Prairie Potholes. There were an estimated 19 million visits to the System.
1971	Greenwalt named 11th Refuge System Chief: Born in Nevada in 1932, Lynn Greenwalt grew up on refuges. His father worked at refuges and Greenwalt spent his first 5 years at Sheldon NWR in NV and about the next 20 at Wichita Mountains NWR in OK. His university training included a BS in zoology from the University of Oklahoma and an MS in wildlife management from the University of Arizona. Greenwalt’s first positions with the FWS were at Wichita Mountains NWR and Bear River MBR in Utah. Following a 2-year break for military service, he then worked at National Elk Refuge, WY; Salt Plains NWR, OK; Bosque del Apache NWR, NM; and Fish Springs NWR, UT. He then shifted to Regional office assignments, first as a regional refuge planner and then Assistant Refuge Supervisor in the Albuquerque RO; then to Twin Cities, MN; and then to Portland, OR where he was the Regional Supervisor of Law Enforcement. Following the Portland assignment, Greenwalt would go to Washington DC as Chief of the Division of Refuges. The FWS Director during his tenure as Chief of Refuges (1971-1973) was Spencer Smith. Greenwalt’s tenure as Refuge Chief was relatively brief and he would be asked to serve in a Special Assistant position dealing with predators and rodent control, then on to be the FWS Assistant Director for Operations. He would ultimately become FWS Director serving from 1973-1981. Learn more at Lynn Greenwalt oral history transcript - Documents - USFWS National Digital Library
1971	Ramsar wetlands program established: The Ramsar Convention on Wetlands was held in Ramsar, Iran in 1971. It resulted in an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of Wetlands of International Importance and to plan for the “wise use” or sustainable use, of all wetlands in their territories. As of 2021, worldwide there

	are 2,422 Ramsar wetlands, 39 of which are in the U.S. A total of 26 of the 41 U.S. Wetlands of International Importance are on national wildlife refuges. Learn more at Ramsar: Homepage .
1971	Alaska Native Claims Settlement Act enacted: This Act authorized Alaska Natives to select and receive 44 million acres of public land in the state. The law also restricted the selection of lands from existing national wildlife refuges and authorized the withdrawal of up to 80 million acres of public land for consideration as national wildlife refuges and national parks. This landmark legislation helped set in motion an intensive 9-year effort of additional analysis and debate that ultimately resulted in passage of the Alaska National Interest Land Conservation Act in 1980.
1972	Clean Water Act enacted: This law was passed in response to the nearly unchecked dumping of pollution into our waterways. The goal of the Act is to reduce pollution in all U.S. waters to "restore and maintain the chemical, physical, and biological integrity of our nation's waters" and to restore water quality to "fishable and swimmable" levels.
1972	San Francisco Bay and Tinicum become first urban refuges: Congress passed legislation on June 30, 1972 establishing the Refuge System's first 2 urban refuges: San Francisco Bay NWR and Tinicum NWR (in Philadelphia). (San Francisco Bay NWR was later renamed the Don Edwards San Francisco Bay NWR to honor Congressman Don Edwards who was pivotal in establishing the refuge and Tinicum NWR was later renamed the John Heinz NWR at Tinicum to honor Senator John Heinz for his dedication to conserving the marsh). Urban refuges were not given much consideration at this time as the common thinking was that wildlife refuges should be established away from major urban areas in rural areas of most benefit to waterfowl. However, as our nation's human population continued to grow and place greater stresses on the environment, more urban refuges would follow. They included Minnesota Valley NWR in Twin Cities MN in 1976, Bayou Sauvage NWR near New Orleans in 1990, Neal Smith NWR near Des Moines in 1991, and Rocky Mountain Arsenal NWR near Denver in 1993. All these urban refuges share the common element of being established by Congress as the result of local conservation advocates and an engaged Congressional advocate or advocates. As time progressed, urban refuges have continued to grow as a vital component of the Refuge System. See additional information in the 2013 entry in this document on the FWS urban wildlife program.
1973	Greenwalt named Director of FWS: Lynn Greenwalt who was Director from 1973 to 1981 is the only FWS Director to have served as an on-the-ground refuge manager. Following his Directorship, he served 13 years with the National Wildlife Federation. He was a popular speaker who presented for a number of Refuge System conferences and meetings, Friend's conferences, and other gatherings. He is esteemed for his encouragement to refuge supporters to keep "saving dirt".
1973	Endangered Species Act amended: Amendments to the Endangered Species Act provide new authorities "whereby the ecosystems upon which endangered species and threatened species depend may be conserved." About 60 national wildlife refuges have been established with a primary purpose of protecting various threatened and endangered species. A list of refuges established primarily for endangered species protection and recovery is at https://en.wikipedia.org/wiki/List_of_National_Wildlife_Refuges_established_for_endangered_species
1974	BSFW renamed Fish and Wildlife Service: The Bureau of Sport Fisheries and Wildlife (BSFW) is renamed the U.S. Fish and Wildlife Service.
1974	Pulliam named 12th Refuge System Chief: James (Jim) Pulliam was the 12th Chief of the Refuge System. Born in North Carolina in 1936, he holds a Wildlife Management degree from North Carolina State (1958). His FWS career started at Mingo NWR, MO in 1958. He also served at the Upper Mississippi NFWR; the Area Acquisition Office in Aberdeen, SD as a wildlife biologist; the Northeast South Dakota WMD as Manager, and Lacassine NWR, LA as Manager before joining the Branch of Programs, Division of Refuges in Washington, DC. He then served as Assistant Supervisor for Refuge Operations in Albuquerque before returning to DC as the Assistant Chief of the Refuge Division, and in May 1974 was named Chief of the Refuge Division. Director of the FWS during his tenure was Lynn Greenwalt. Following his tenure as Refuge Chief (1974-1976), Pulliam served as Deputy Associate Director for Fish and Wildlife Management, Deputy Associate Director for the

	National Wildlife Refuge System (supervising the Divisions of Refuges, Realty, Youth Conservation Programs and the Alaska Native Claims office). In 1982 he became Regional Director for the Southeast Region, Atlanta, GA, where he served until his retirement in 1994.
1975	“Fifty Birds” published: "Fifty Birds of Town and City" by Bob Hines and Peter Anastasi is published. This was one of the more popular brochures produced by the FWS. It was richly illustrated by Bob Hines artwork. Learn more at Fifty Birds of Town and City, by Bob Hines and Peter A. Anastasi
1975	National Wildlife Refuge Association founded: The NWRA's mission: As the leading independent voice advocating on behalf of the National Wildlife Refuge System, we protect, promote and enhance America's wildlife heritage through strategic programs that serve the System and wildlife beyond its boundaries. The Refuge Association was founded by a group of retired refuge employees with many collective years of experience in managing refuges. The first president of the Association was Forrest Carpenter, retired Refuge Supervisor for the Minneapolis Region of the FWS. He served as president for 13 years. Learn more at The National Wildlife Refuge Association and https://commons.wikimedia.org/w/index.php?title=File:Refuge_Update_March_April_2011.pdf&page=24
1975	Refuge modifications prior to 1976: Philip Dumont in the Division of Wildlife Refuges and Henry Thomas in the Division of Realty complete an unpublished white paper "Modification of National Wildlife Refuges" that documents changes in wildlife refuges in the first 72 years of the Refuge System. During those years, quite a number of refuges were combined, modified, or abandoned and this paper lists those changes. Legislation in 1976 required approval of Congress for these types of changes in subsequent years. Learn more at https://ecos.fws.gov/ServCat/DownloadFile/147605
1976	Final EIS on operation of the Refuge System: The FWS publishes the final EIS on "Operation of the National Wildlife Refuge System". The EIS was prepared as a result of a lawsuit brought in 1974 by private conservation groups concerned with how individual refuges were being funded and managed. A draft EIS was issued followed by 8 public hearings across the country, subsequent amendments and publication of the final in November 1976. This was the first programmatic EIS completed on management of the NWRS and it was to be repeated every 10 years in the future. Learn more at https://www.google.com/books/edition/Operation_of_the_National_Wildlife_Refug/LIPd-eyJChwC?hl=en
1976	Wetlands loan extended: The Wetlands Loan Act was extended another 7 years (to 1983) which helped provide funds to acquire waterfowl habitat for addition to the Refuge System.
1976	Lead for protecting wildlife on federal lands affirmed: The Supreme Court ruling in <i>Kleppe v. New Mexico</i> ruled that the constitution's property clause necessarily gives the federal government the lead role in regulating and protecting wildlife on federal lands.
1976	Refuge System Administration Act amended: The Refuge System Administration Act was amended to transfer jurisdiction of "game ranges" to the FWS as part of the Refuge System. Game ranges were previously jointly managed with the Bureau of Land Management under terms of the Taylor Grazing Act of 1934 (This impacted 5 large refuges in the West: Cabeza Prieta and Kofa Ranges in Arizona, Desert Game Range in Nevada, Charles Sheldon Antelope Range in Nevada and Oregon, and Charles M. Russell National Wildlife Range in Montana (See more at "National Game Ranges: The Orphans of the National Wildlife Refuge System" by Alan Larsen in <i>Environmental Law</i> , Vol. 6, No. 2, pp. 515-541 available from JSTOR)); and 2) require approval of Congress before disposing of any refuges. Prior to this time a number of refuges were administratively disposed of by the FWS.
1976	Walsh Ditch Fire: The Walsh Ditch Fire on Seney NWR in MI highlighted the need for a professional fire management organization for the Refuge System. The fire was spotted within designated wilderness on the refuge and the refuge manager thought no action could be taken on the fire since it was in wilderness. Several weeks after the initial report, the fire "blew up" and spread out of the wilderness and off the refuge. A Department of the Interior incident management team finally suppressed the fire with many costly techniques and little input from the Service, leading to

	<p>Congressional interest in implementing a more structured fire management program for FWS. The fire burned 64,000 acres and took 5 weeks and 1,000 firefighters to control.</p>
1976	<p>Nelson named 13th Refuge System Chief: Marcus Nelson was the 13th Chief of the Refuge System. He was born and raised in Brigham, Utah and received a BS degree from Utah State College in 1938. His first job with the FWS was in 1937 as a Student Aide at Medicine Lake Refuge, MT. During 1938 and 1938 he was a student intern at Utah State College doing research on waterfowl diseases at Bear River MBR. From 1940-44 he worked for the State of Utah doing research on waterfowl at 6 national wildlife refuges in Utah. He then joined the FWS at the Bear River MBR in 1944. Shortly thereafter he was assigned to help establish Tishomingo NWR, OK and Hagerman NWR, TX. He became the first Refuge Manager of Hagerman Refuge, TX in 1945. In 1951 he joined the Albuquerque Regional Office as Assistant Refuge Supervisor for the Region. Also during this time, he and Forrest Carpenter (from the Twin Cities Region), along with Phil DuMont from the National Headquarters, were the primary authors of the 1957 Refuge Manual. In 1963 he became Refuge Supervisor for the 27 refuges in the Albuquerque Region and continued in that position until 1976. He then joined the Washington Headquarters office as Chief of the Division of Refuges in 1976. He retired in 1980 after 37 years with the FWS. At the time of Nelson's assignment as Chief of Wildlife Refuges, the System consisted of 378 National Wildlife Refuges encompassing more than 34 million acres. Jim Kurth, a more recent Refuge System Chief has stated the following about Nelson: "I like to tell Refuge Management Academy students about a cassette tape that recorded the festivities at Marcus C. Nelson's retirement party. Mark was chief of the Refuge System when he retired. He talked with joy of his first job at Medicine Lake Refuge in 1937 during the Dust Bowl. Mark told his friends he learned that the way to make progress, to get things accomplished, was to "never quit digging, never quit hacking away." He told them to never give up. Because if you stop and you were the only one trying, all progress stops." The FWS Director during Nelson's tenure as Refuge System Chief was Lynn Greenwalt. After retiring from FWS, Nelson was Washington DC representative for the National Wildlife Refuge Association.</p>
1977	<p>Refuge System stats: The FWS publishes the "Directory of National Wildlife Refuges 1977". The name, establishment date, acreage, and primary wildlife species is given for the 384 refuges in the System, as of September 30, 1976, which in the aggregate contained 32,442,854 acres. At least 137 units protect one or more of 44 endangered species of wildlife. Additionally, Waterfowl Production Areas, secured both by purchase and through easements (principally in ND, SD, MN, NE, WI, MT) are aggregated by county and as a whole contained 1,479,767 acres https://ecos.fws.gov/ServCat/DownloadFile/101275?Reference=60917 There were an estimated 843 field station employees, an annual budget of \$25 million and an estimated 28 million visits.</p>
1977	<p>Bicentennial Land Heritage Program begins: Championed by President Gerald Ford, BLHP commemorated our nation's bicentennial by investing in facilities on our public lands. The five-year program (\$180 million over the 5 years FY 1977 – FY 1981) provided much needed construction funding for the Refuge System to improve water management structures, build visitor and administrative buildings, and improve roads and visitor facilities.</p>
1977	<p>Alaska wildlife reservations publication: "The Reservation of Wildlife Habitat in Alaska" by David L. Spencer is published by the University of Alaska. It describes the various state and federal roles and underlying legislative authorities for wildlife conservation and management in Alaska since statehood. Prepared for the Joint Federal-State Planning Commission for Alaska, the report emphasized management of lands with designated wildlife purposes and provided input for planning activities eventually contributing to the enactment of ANILCA in 1980. Learn more at https://books.google.com/books?id=IDQIAQAAMAAJ&pg=PP9&lpg=PP9&dq=reservation+of+wildlife+habitat+in+alaska+spencer&source=bl&ots=qPGwhDq1sj&sig=ACfU3U0KrH0sRuMKHEIUeddkXcUH3eKAq&hl=en&sa=X&ved=2ahUKEwjYnoCa_J_oAhUiiniEHQC9C3EQ6AEwAHoECAwQAQ#v=onepage&q=reservation%20of%20wildlife%20habitat%20in%20alaska%20spencer&f=false</p>
1977	<p>Margaret Murie testifies on behalf of Arctic NWR: Margaret Murie testifies on behalf of Arctic NWR in Congressional hearings that contributed to passage of the Alaska National Interest Conservation Act in 1980. Her testimony along with visuals of Alaska's wild places may be seen at https://www.youtube.com/watch?v=FFyQ1YNRvOU</p>

1978	Refuge Academy reopens: The Refuge Management Training Academy reopened with 4-week courses held at Beckley, WV. The academy had not been held since 1970.
1978	FWS fire program formalized: The FWS Fire Management Program was formally instituted when the position of Fire Management Coordinator was filled making the FWS Fire Management Program the youngest of the five federal land management agencies.
1978	Wildlife and America Symposium: The President's Council on Environmental Quality holds the symposium "Wildlife and America: Contributions to an Understanding of American Wildlife and its Conservation". The published proceedings https://www.google.com/books/edition/Wildlife_and_America/G0vi92XNSGgC?hl=en include the paper "The National Wildlife Refuge System" by FWS Director Lynn Greenwalt (pages 399-413). It describes the origin, current management issues, and future outlook for the System.
1979	Herbst report issued: The "Final Recommendations on the Management of the National Wildlife Refuge System" is published. In 1977, Assistant Secretary Robert L. Herbst established a Wildlife Refuge Study Task Force to address growing concerns from both within and outside the FWS about the policy, operation, maintenance, funding, administration, and identity of the National Wildlife Refuge System. The 1979 "Final Recommendations" report lists 26 recommendations from the Task Force along with comments and amendments by the FWS Director and AS Herbst. The report was approved for implementation by DOI Secretary Cecil Andrus. Learn more at https://babel.hathitrust.org/cgi/pt?id=umRn.31951p00916784s&view=1up&seq=1&skin=2021
1979	FWS joins Boise Interagency Fire Center: The FWS joins the Boise Interagency Fire Center which was formed in 1965 when the US Forest Service, Bureau of Land Management, and National Weather Service saw the need to work together to reduce the duplication of services, cut costs, and coordinate national wildland fire planning and operations. Learn more about programs and operations of what is now called the National Interagency Fire Center at National Interagency Fire Center: Welcome to the Nation's Logistical Support Center
1979	First refuge firefighting fatality: Richard S. Bolt, Jr. became the first refuge employee to die from firefighting injuries. He was injured while plowing a firebreak at Okefenokee NWR in Georgia. His actions helped save a large number of people who were in a nearby picnic area. He was posthumously presented with the Department of Interior's Valor Award and Letter of Commendation in 1979 in Washington, DC. https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.facebook.com%2Ffireservice%2Flineofdeath%2Fphotos%2Fa.403074613186823%2F2068217930005808%2F%3Ftype%3D3%26av%3D1487515880%26eav%3DAfanru85peZEoyRPL7spVDJLE_qWSZ4JX5Hb0boFCsIIIiCPxLSNrleTQD6LcX-cdws&data=05%7C01%7C%7C8a63748ca19a43ae2b6508db29434604%7C84df9e7fe9f640afb435aaaaaa%7C1%7C0%7C638149141137429149%7CUnknown%7CTWFpbGZsb3d8eyJWljojMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTiI6IjEhaWwiLCJXVCi6Mn0%3D%7C3000%7C%7C%7C&sdata=PuOGBVv2OM%2B%2FD%2F%2BeHdml%2Blui99sH2P5tHbejf%2Bq24uM%3D&reserved=0 (see related mention of 2 firefighting fatalities in 1981)

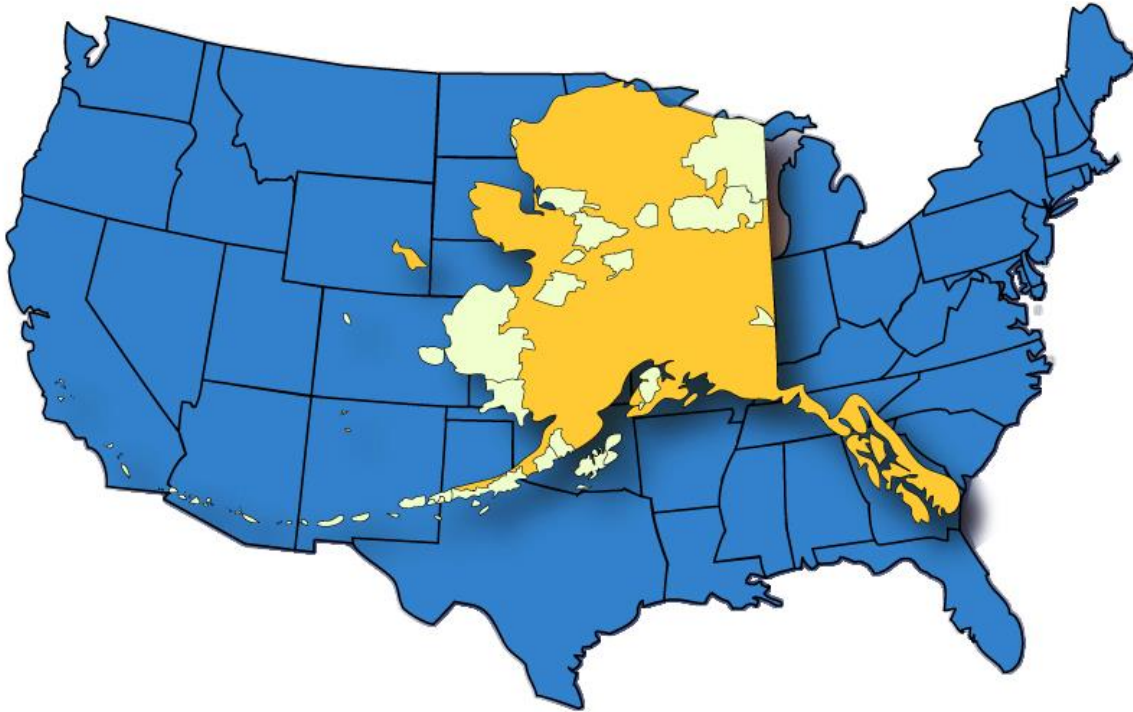
Era #5: ALASKA, NORTH AMERICA'S SERENGETI (1980)

Rather than an era of time, this section deals with enactment of a single law of such significance to the Refuge System that it warrants a separate discussion.

Alaska dwarfs the rest of the country's biggest states by a magnitude of five or more. Before statehood in 1959, Alaska contained a few parcels that were designated as wildlife reserves for sea birds, waterfowl, and moose. But the majority of the state's vast tracts of untouched boreal forests, bogs, mountain peaks, and tundra had yet to be fully explored. Land settlement was widely disputed during the state's infancy and in an effort to settle the state, Congress passed the Alaska Native Claims Settlement Act of 1971 (ANCSA), an outgrowth of the Alaska Statehood Act. This law incidentally became of enormous importance to the NWRS. Among numerous other provisions, it authorized the addition of immense acreages of highly productive, internationally significant wildlife lands to the NWRS.

The vastness and uniqueness of wild Alaska is truly phenomenal. The efforts of the FWS and associated partners in conserving these resources and providing for their public enjoyment is well expressed in the banner accompanying the online series of articles by FWS's Alaska Regional Office: *In Alaska we are shared stewards of world renowned natural resources and our nation's last true wild places. Our hope is that each generation has the opportunity to live with, live from, discover and enjoy the wildness of this awe-inspiring land and the people who love and depend on it.* See the following article for an introduction of the importance of Alaska to migratory birds [Arctic Birds on the Fly](#)

The designation of specific lands to be added to the Refuge System, along with other far-reaching resource protection measures for Alaska came in 1980, with the passage of the Alaska National Interest Land Conservation Act (ANILCA). ANILCA nearly tripled the acreage of the Refuge System, establishing nine new refuges, expanding seven refuges, and adding 53.7 million acres to the NWRS (Actual acreage added is larger, but precise calculations became possible only through the use of modern technology). Many of Alaska's 16 national wildlife refuges are the size of individual states in the lower 48. For example, Arctic National Wildlife Refuge is roughly the size of North Carolina.



The above to scale graphic compares Alaska to the lower 48 states (NWRs in Alaska are in white). Alaska's east and west limits span about the same distance as from the east to west coast of the lower 48. Alaska's north and south limits span about the same distance as from the Canadian border to the Mexican border in the lower 48. The immensity of size plus the remoteness of most Alaska NWRs obviously has a profound impact on logistics of management activities and public visitation.

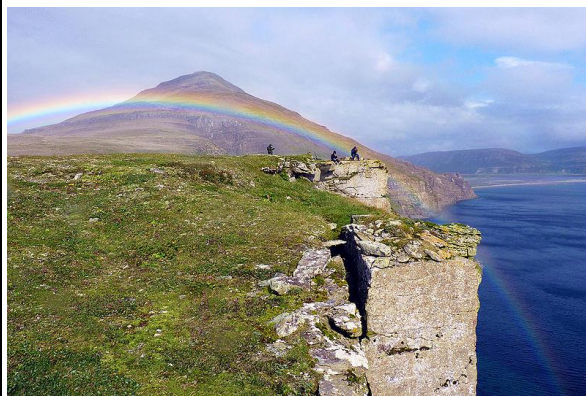


Float planes such as pictured above are essential for transportation to most Alaska NWRs.

A photo from each of the 9 new refuges established by ANILCA along with a brief synopsis of their features follows:



Alaska Peninsula NWR (3.6 million acres) is a land of towering mountains (photo), active volcanoes, broad valleys, fjords, tundra and glacially formed lakes. The Bristol Bay side of the Refuge is primarily flat to rolling tundra, lakes and wetlands. From these coastal lowlands, the land rises to steep glaciated mountains, forming the spine of the Refuge, and then plunges to steep cliffs and sandy beaches on the Pacific side. Several of the Refuge's volcanoes have been active in the recent past. The Refuge is home to almost 40% of the Bristol Bay sockeye salmon run, the largest sustainable sockeye fishery in the world.



Becharof NWR (1.2 million acres including 400,000 acres of Wilderness) contains Becharof Lake (about 300,000 acres), the largest lake in the Refuge System. Six million sockeye salmon run here annually, supporting a wide range of wildlife. Dolly Varden char and Arctic grayling grow to impressive sizes on a salmon-rich diet, along with brown bears, cormorants, terns, and bald eagles. Several places on the lake are popular for angling. The drainages feeding into the lake are habitat for moose, caribou, nesting waterfowl and songbirds, small mammals, and other species in a rich matrix of vegetation types. It also includes an active volcano, unusual geological features, historically significant landmarks, and the 400,000-acre Becharof Wilderness.



Innoko NWR (3.9 million acres including 1.2 million of Wilderness) with no human settlements, no roads, and no easy access has few human visitors; but, an abundance of wildlife calls the Refuge home. Each summer, thousands of waterfowl nest on the plentiful wetlands. The Refuge is one of the largest migrating waterfowl staging areas in Alaska. Wildlife and plants provide valuable subsistence resources for communities along the Yukon River, which forms the Refuge's western border. Recreation opportunities include the famed Iditarod Trail which passes through the Refuge.



Kanuti NWR (1.6 million acres) straddles the Arctic Circle, with about a third of the Refuge above the Circle and two-thirds below it. The Refuge is a prime example of Alaska's boreal ecosystem, the forests of which are dominated by black and white spruce with Alaskan (or paper) birch, aspen and poplar trees occurring less commonly. It was set aside primarily because of its rich and diverse waterfowl habitats. Nearly 130 species of birds spend at least part of the year on refuge lands. Migratory fish such as chinook, chum and coho salmon, whitefish, and sheefish, travel extreme distances (over 1,000 miles) to spawn on Kanuti Refuge.



Koyukuk NWR (3.6 million acres including 400,000 acres of Wilderness) is rich in wetlands, excellent for moose and waterfowl. The rivers support sheefish, arctic grayling, Dolly Varden, northern pike and three species of salmon. Northern pikes are so well fed they often grow to record size. Wetland habitats during the summer host hundreds of thousands of migratory waterfowl nesting, feeding and raising their young. The Koyukuk Wilderness is 400,000 acres of probably the most productive moose habitat in all of Alaska.



Nowitna NWR (1.6 million acres) is river valley, wetlands, forest and tundra. The Nowitna River floodplain comes alive each spring with migratory songbirds and waterfowl. The river passes through a scenic 15-mile canyon. The refuge is important breeding habitat for waterfowl and other birds. King and chum salmon, northern pike, and one of only three resident sheefish populations in Alaska are in the River. Forested lowlands give rise to mature white spruce that is habitat for marten, furbearers important to the local economy. Moose, wolves, lynx, wolverines, black and grizzly bears are throughout.



Selawik NWR (2.2 million acres including 240,000 acres of Wilderness) on the Arctic Circle has unique landscapes: alpine and arctic tundra, taiga, lake and wetland complexes, large river deltas, grass and sedge meadows, and glaciated mountains and river valleys. The Selawik and Kobuk River deltas support thousands of migratory birds. The about 21,000 lakes on lowlands create an arctic tundra lake complex comparable in scale and significance to any of Alaska's refuges. The 240,000-acre Selawik Wilderness is scenic due to spruce forests and foothills that rise in elevation to about 1,700 feet. The upper 168 miles of the Selawik River is a National Wild River.



Tetlin NWR (0.7 million acres) is home to a diversity of wildlife representative of the boreal forest region of Alaska, with additional species that are more commonly found further south and east of Alaska in Yukon and northern British Columbia, Canada. The refuge is host to 42 species of mammals, 15 fish species, one amphibian, 160 migratory and 30 resident bird species. Located on the AICan Highway, it is one of the more accessible refuges in Alaska for visitors.



Yukon Flats NWR (8.6 million acres) extends 220 miles east-west along the Arctic Circle. Tens of thousands of lakes and ponds dot the Refuge, mostly in floodplains of the Yukon River and its tributaries. The abundant water is habitat for waterfowl from all four North American flyways. The refuge supports mammals, fish, and birds important in natural diversity and traditional subsistence for local residents. Waterfowl nesting and rearing habitat is of national significance. The refuge hosts up to 2 million ducks and has the highest breeding densities in Alaska.

The 7 refuges below were expanded by ANILCA:



Alaska Maritime NWR – Eleven existing refuges were combined and an additional 460,000 acres was added along with an undetermined amount of submerged lands; two Wilderness areas were established (Aleutian Islands – 1.3 million acres and Unimak – 0.9 million acres). Current refuge acreage is 3.4 million acres. The Refuge includes spectacular volcanic islands of the Aleutian chain, seabird cliffs of the remote Pribilofs, and icebound lands washed by the Chukchi Sea, providing essential habitat for some 40 million seabirds, of more than 30 species. Thousands of islands are spread over thousands of miles; travel from one end of the refuge to the other is like traveling from Georgia to California.



Arctic NWR – 9.2 million acres was added to the former Arctic National Wildlife Range to form the largest NWR in Alaska at 19.3 million acres: a new 8-million-acre Wilderness was established (renamed in 1996 after former FWS Director Mollie Beattie). Arctic Refuge is home to some of the most diverse and spectacular wildlife in the arctic. The Refuge's rich pageant of wildlife includes 42 fish species, 37 land mammals, eight marine mammals, and more than 200 migratory and resident bird species. The Arctic NWR is the most studied and written about refuge in the System due to the long-standing controversy over whether or not to allow oil drilling in the Coastal Plain (1002 area)



Izembek NWR - The Izembek National Wildlife Range (0.3 million acres) was redesignated the Izembek NWR. One of the most ecologically unique of Alaska's refuges, most is designated Wilderness. It protects a wide variety of fish and wildlife and their habitats. At the heart of the Refuge is the 150-square mile Izembek Lagoon which supports one of the world's largest beds of eelgrass, creating a rich feeding and resting area for hundreds of thousands of waterfowl. Virtually the entire population of Pacific black brant (150,000 birds), Taverner's Canada geese (55,000), and emperor geese (6,000) inhabit the lagoon each fall. About 23,000 threatened Steller's eiders also rely on Izembek each autumn.



Kenai NWR – The Kenai National Moose Range was redesignated as the Kenai NWR and an additional 420,000 acres was added. 1.4 of the 2-million-acre refuge is designated Wilderness. Elevations range from sea level to over 6,000 feet and diverse habitats including coastal forest, transitional boreal forest, wetlands, lakes, and ice fields make it a biodiversity hotspot for Alaska. It is the most visited refuge in Alaska and hosts a popular and widely known recreational salmon fishery.

	<p>Kodiak NWR – Known around the world as home of the Kodiak brown bear, the refuge was expanded by 50,000 acres by ANILCA. Misty fjords, deep glacial valleys, and lofty mountains distinguish the 1.9-million-acre refuge. Diverse habitats include 117 salmon-bearing streams, 16 lakes, riparian wetlands, grasslands, shrub lands, spruce forest, tundra, and alpine meadows. They sustain 3,000 bears, account for up to 30 million salmon caught by the Kodiak-based fishing fleet, support over 400 breeding pairs of bald eagles, and are essential migration and breeding habitat for another 250 species of fish, birds and mammals. Such natural abundance and spectacular scenery attracts thousands of visitors to the refuge.</p>
	<p>Togiak NWR - ANILCA added 3.9 million acres to the former Cape Newenham NWR and renamed it Togiak; within that was 2.3 million acres of designated Wilderness. The Refuge features a variety of landscapes, including mountain crags, fast-flowing rivers, deep lakes, tundra, marshy lowlands, ponds, estuaries, coastal lagoons, and sea cliffs. The glacial valleys of the Ahklun Mountain range cut the tundra uplands, opening into coastal plains. The Ahklun Mountains spread across 80 percent of the Refuge. Cape Peirce, on the southwestern tip of the refuge, is one of only two regularly used land-based haulouts for Pacific walrus in North America.</p>
	<p>Yukon Delta NWR – ANILCA combined 3 refuges and added 13.4 million acres (1.9 million acres Wilderness) to form the 19.2 million-acre Yukon Delta NWR. Most of the refuge is a vast, flat wetland/tundra complex interspersed by countless ponds, lakes, and meandering rivers. It supports one of the largest aggregations of water birds in the world. Over 1 million ducks and half a million geese breed here annually. In summer, up to 1/3 of the continent's northern pintails are on the refuge. Also, nearly 40,000 loons, 40,000 grebes, 100,000 swans and 30,000 cranes nest here. Millions of shorebirds breed and stage on the refuge. The delta is the most important shorebird nesting area in the country, and the vast intertidal zone is the most important for post-breeding shorebirds on the west coast of North America.</p>

ANILCA prescribed the following purposes for National Wildlife Refuges in Alaska:

1. to conserve fish and wildlife populations and habitats in their natural diversity
2. to fulfill international treaty obligations for fish and wildlife and their habitats;
3. to provide for continued subsistence uses by local residents (consistent with the above 2 purposes); and
4. to ensure, to the maximum extent practicable and consistent with purpose 1 above, water quality and necessary water quantity within the refuge.

ANILCA also directed the preparation and periodic update of conservation plans for each Alaska refuge. These plans provide the foundation to manage all activities and uses consistent with the purposes of the refuges. These Comprehensive Conservation Plans further the following goals:

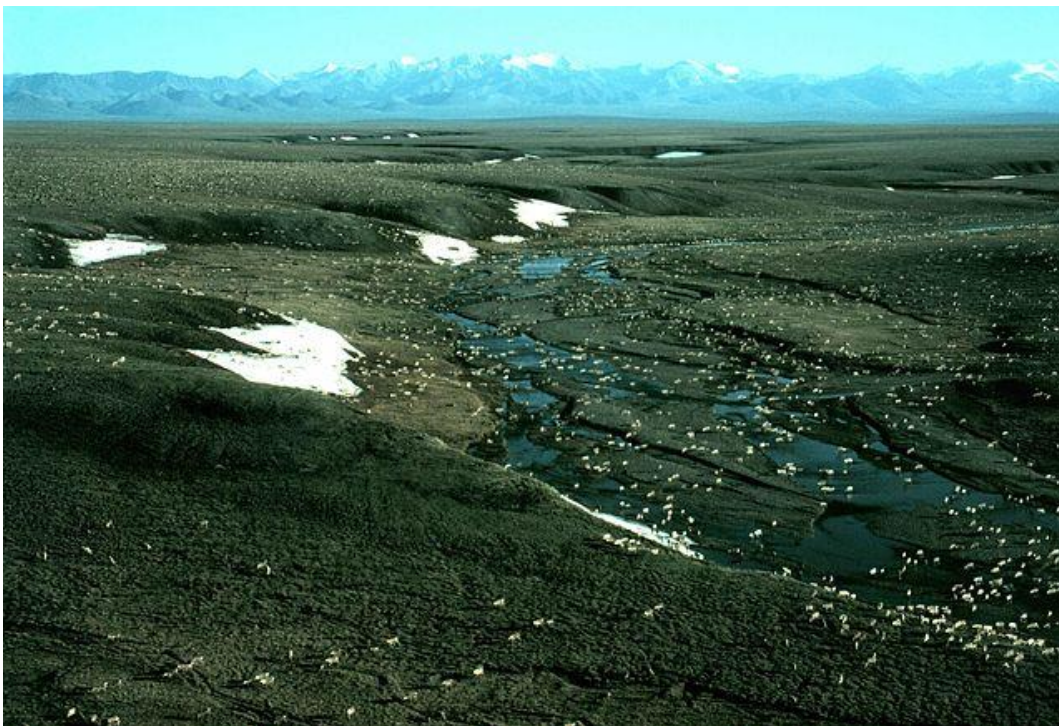
- purposes of the refuge and mission of the Refuge System are being fulfilled
- national policy direction is incorporated into management of the refuge
- interested parties can participate in developing management direction

- a systematic process is in place to make and document decisions as broad strategies to guide refuge management are developed
- a basis to evaluate accomplishments is provided

The requirement in ANILCA to complete Comprehensive Conservation Plans carried forward into future thinking and a similar process was incorporated in the Refuge System Improvement Act of 1998 for the entire Refuge System.

One question that was not resolved in the ANILCA law was whether or not exploration and extraction of oil and gas would be allowed in a portion of the Arctic National Wildlife Refuge. This question has been an ongoing political controversy since 1977. As a compromise measure on this question, ANILCA provided in Section 1002 of the Act that a comprehensive inventory of fish and wildlife resources would be conducted on 1.5 million acres of the Arctic Refuge coastal plain (1002 Area). Potential petroleum reserves in the 1002 Area were also to be evaluated from surface geological studies and seismic exploration surveys. No exploratory drilling was allowed. Results of these studies and recommendations for future management of the Arctic Refuge coastal plain were prepared in a report to Congress. Numerous attempts have been made through the years to open the 1002 area to oil and gas drilling but all failed until 2017 when the Republican-controlled House and Senate included in tax legislation a provision that would open the 1002 area to oil and gas drilling. Efforts to overturn that provision continue to this day.

ANILCA strengthened the National Wildlife Refuge System by entrusting it with immense world class conservation treasures within Alaska. Among its treasures: the international Porcupine caribou herd of Arctic National Wildlife Refuge, the brown bears of Kodiak National Wildlife Refuge, the teeming seabird populations of Alaska Maritime National Wildlife Refuge, the world-class sport salmon fishery on Alaska Peninsula and Kenai National Wildlife Refuges, and nearly 20 million acres of Wilderness.



Caribou, part of the Porcupine herd, dot the summer landscape at Arctic NWR

Table 5. Timeline for ERA #5: Alaska, North America's Serengeti (1980)

Overview: Rather than an era of time, this section deals with enactment of a single law for the immense wild lands of Alaska. This law is of such significance to the Refuge System that it warrants a separate discussion.

1980	<p>Alaska National Interest Lands Conservation Act enacted: ANILCA provided for the designation and conservation of certain public lands in Alaska, including units of the Refuge System, and for the continuing subsistence needs of the Alaska Natives. Sec. 42(g) of this Act makes use of such Native lands subject to refuge regulations. It dramatically increases the size of the Refuge System, adding 9 new refuges, expanding 7 existing refuges, adding more than 53 million acres of land, and designating numerous Wilderness areas. The Act designated 1.5 million acres of the coastal plain of the Arctic NWR as the 1002 area and mandated studies of the natural resources of this area, especially petroleum. Numerous attempts have been made through the years to open the 1002 area to oil and gas drilling but all failed until 2017 when the Republican-controlled House and Senate included in tax legislation a provision that would open the 1002 area to oil and gas drilling. ANILCA also provided for continued subsistence use of federal lands by Alaska natives. Learn more at https://www.congress.gov/bill/96th-congress/house-bill/39?q=%7B%22search%22%3A%5B%22alaska+national+interest+lands+conservation+act%22%5D%7D&s=4&r=1. For a video highlighting Alaska NWRs see https://www.youtube.com/watch?v=Z19rGB_DVs8 or https://www.youtube.com/watch?v=8iBEHPmC02I. A video of arguably the most iconic refuge in Alaska, Arctic NWR, is at https://www.youtube.com/watch?v=W8nrgwXoi0Q. To learn more about Alaska refuges see Alaska Maritime, Alaska Peninsula, Arctic, Becharof, Innoko, Izembek, Kanuti, Kenai, Kodiak, Koyukuk, Nowitna, Selawik National Wildlife Refuge, Tetlin, Togiak, Yukon Delta, Yukon Flats; http://alaskarefugefriends.org/# ; and https://alaskaufws.medium.com/</p>
1980	<p>Reffalt named 14th Refuge System Chief: William C. (Bill) Reffalt is a native of Denver, CO and holds a BS in wildlife management from Colorado State University. After joining the FWS in 1963; he worked in refuge management at the Deer Flat and Minidoka NWRs in ID, Bear River Migratory Bird Refuge in UT, and as refuge manager of the Bitter Lake NWR in NM. He was selected for the Departmental Manager Development Program and afterwards spent four years in the Albuquerque RO with the Federal Aid program before becoming a Regional Refuge Biologist. Just prior to being named Chief of the Division of National Wildlife Refuges, Reffalt spent eight years as the FWS's representative to the Department on the Alaska natural resource and land planning effort and as Chief of the Alaska Native Claims Settlement Staff where he played a major role in expansion of the Refuge System in Alaska. ANILCA nearly tripled the acreage of the Refuge System, establishing nine new refuges, expanding seven refuges, and adding 53.7 million acres to the NWRS. This was by far both the biggest opportunity as well as challenge at this time. During his tenure (1980-1982) as Chief of the Refuge System, Reffalt also focused on helping guide refuges as a unified system, increasing public understanding and recognition of the function of national wildlife refuges, and implementing recommendations from the 1979 Herbst report. FWS Directors during Reffalt's tenure as Refuge Chief were Lynn Greenwalt and Robert Jantzen. Following his stint as Chief of Refuges, Reffalt was Chief of the Division of Wildlife Management which oversaw the FWS animal damage control program. Following his career with the FWS, he worked with the Wilderness Society from 1984-1999. Learn more at https://digitalmedia.fws.gov/digital/collection/document/id/1292/rec/1.</p>
1980	<p>Refuge System stats with ANILCA: With ANILCA and other growth, the NWRS as of September 30, 1980, comprised 86.7 million acres of refuges in 404 units located in 49 states and 6 U.S. Territories; and 1.6 million acres of waterfowl production areas in 141 counties. There were about 1,300 full-time-equivalents in the workforce, and the annual operations and maintenance budget was \$57 million. Total visitation for the fiscal year was estimated to be 26.4 million.</p>

Era #6: THE SYSTEM CONTINUES TO MATURE (1981-2003)

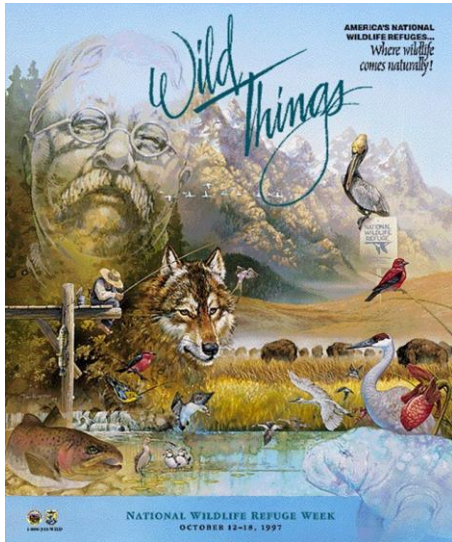
This era marks the roughly 2 decades leading up to the centennial of the Refuge System. During this time, the U.S. population grew from 225 (26% rural) to 290 (20% rural) million. The growing human population was exerting more and more pressure on wildlife habitats during this era and even already protected national wildlife refuges were increasingly feeling the pressure of activities outside their boundary having substantive negative impacts on wildlife using the refuges.

Public interest in establishing new refuges and expanding existing refuges remained high during this era; a total of 139 new refuges were established. Environmental disasters such as the Exxon Valdez oil spill (The Exxon Valdez oil tanker ran aground in Prince William Sound Alaska and spilled nearly 11 million gallons of crude oil over the next few days. Considered to be one of the worst human-caused environmental disasters, it impacted 1,300 miles of shoreline and was the worst oil spill in the U.S. at that time.) helped galvanize support for environmental protection measures.

Public appreciation of the Refuge System continued to grow as total annual visitation increased from 26 million in FY 1980 to 40 million by FY 2003. With increased visitation also came a growing number of volunteers who assisted with a wide range of activities. In 1982, a total of 4,250 volunteers contributed 128,000 hours of time to the FWS as a whole. By 2003, an estimated 30,000 volunteers contributed about 1.3 million hours to the Refuge System.

In the late '80s, a major controversy arose over widely disparate and inconsistent management of uses that were being allowed on refuges. A damning 1989 GAO report (NATIONAL WILDLIFE REFUGES: Continuing Problems With Incompatible Uses Call for Bold Action) and the lawsuit that followed brought a concerted effort to remove incompatible uses on refuges. It was also one of a number of rallying cries that urged passage of organic legislation to improve management of the struggling Refuge System. Other calls for change to deal with long-standing management challenges, many of which revolved around failure to function as a system, were documented in Secretary Udall's 1968 Advisory Board Report, the 1979 Herbst Report, the 1992 "Putting Wildlife First" Report by Defenders of Wildlife and Richard Fink's 1994 analysis in the Harvard Environmental Review. These reports of problematic management issues provided considerable background leading to Congressional debate to provide organic legislation for the Refuge System, but the new law didn't come until years later with passage of the National Wildlife Refuge System Improvement Act of 1997.

In 1994, the National Wildlife Refuge Association began an annual awards program to recognize outstanding contributions to the Refuge System. Starting with awards for the Refuge Manager of the Year and Volunteer of the Year, the awards have expanded to also include the Friends Group of the Year, Refuge Employee of the Year, and Advocate of the Year. A full listing of award winners is at [Past Winners — The National Wildlife Refuge Association](#).



In 1995, FWS Director Mollie Beattie designated the 2nd week of October as National Wildlife Refuge Week. Observed every year since then, it invites all Americans to learn about, appreciate, and celebrate this magnificent collection of lands and waters we as a people have set aside for wildlife and for the enjoyment of future generations

The Cooperative Alliance for Refuge Enhancement (CARE) was formed in 1995 as a national coalition of 15 major private conservation organizations interested in providing a healthy Refuge System for the benefit of all citizens. Although these organizations have varying purposes and perspectives, they recognized that a long history of underfunding was the critical challenge for the Refuge System. CARE organizations share one common goal: to ensure robust funding to maintain a strong National Wildlife Refuge System. The National Wildlife Refuge Association has played an active role in the CARE efforts throughout the coalition's history. By 2018, the CARE coalition grew to 23 wildlife, sporting, scientific, and conservation organizations that span the political spectrum, representing 16 million Americans who value outdoor recreation and wildlife conservation. CARE has done much through the years to advocate for better budgets for the Refuge System. A history of this unique partnership was published in 2020, marking the 25th anniversary (available by request to NWRS.History.Future@gmail.com).

In 1996, the Refuge System joined the National Wildlife Refuge Association, National Fish and Wildlife Foundation and the National Audubon Society in a partnership called the Friends Initiative to jump start the creation of more refuge support organizations. The Refuge Association produced "Taking Flight: An Introduction to Building Refuge Friends Organizations" (Beverly Heinz-Lacey, lead author), a handbook for starting and operating a Refuge Friend's Organization. It was foundational to many Friend's groups and has many principles still applicable today. The first national conference specifically for members of Friends groups was hosted by the Refuge System and the National Wildlife Refuge Association in 2002. The event was a marked success. In 2008, nearly 300 refuge Friends joined 150 FWS staff for the 5th National Friends Conference, the largest ever. Today about 200 Friends organizations help support the Refuge System.

In 1997 Congress overwhelmingly passed landmark legislation, the National Wildlife Refuge System Improvement Act. It amended the Refuge System Administration Act of 1966 and added significant new guidance. It provided the first-ever statutory mission for the Refuge System and directed that the System be managed as a national system of lands and waters devoted to conserving wildlife and maintaining biological integrity of ecosystems. The law also clarified management priorities by identifying six priority recreational uses (hunting, fishing, wildlife observation, photography, environmental education and interpretation), strengthening the compatibility determination process, and requiring comprehensive conservation plans every 15

years to guide the management of each refuge. Further, the law directed managers to “plan and direct the continued growth of the System in a manner that is best designed to accomplish the mission of the System, to contribute to the conservation of the ecosystems of the United States, to complement efforts of States and other Federal agencies to conserve fish and wildlife and their habitats, and to increase support for the System and participation from conservation partners and the public”.

Another legislative milestone occurred in 1998 when the National Wildlife Refuge Volunteer and Community Partnership Enhancement Act was enacted, encouraging partnerships with organizations to promote the understanding and conservation of fish, wildlife, plants, and cultural resources on refuges, and directing the Service to develop refuge education programs to further the mission of the NWRs. This law is unique among federal land agencies and reinforces the Refuge System’s reliance on private partners and citizens to carry out the important work of conserving America’s wildlife.



Also in 1998, the first-ever Systemwide conference of the Refuge System was held in Keystone, CO. Attended by nearly every refuge manager in the country, other FWS employees, and scores of conservation organizations; the result was publication of "Fulfilling the Promise - The National Wildlife Refuge System Visions for Wildlife, Habitat, People, and Leadership". Follow-on work groups further defined and developed implementation elements to improve the Refuge System and these products were applied throughout the System as they were developed.



The proceedings of “Fulfilling the Promise: The National Wildlife Refuge System”, (<https://digitalmedia.fws.gov/digital/api/collection/document/id/1/download>) published in 1999,

contained vision elements and 42 recommendations for improvement of the Refuge System. Implementing these recommendations became the focus in following years.

One product of the Fulfilling the Promise effort was giving voice to the below Guiding Principles. These principles continue to influence Refuge System stewardship.

National Wildlife Refuge System Guiding Principles

We seek to reflect Leopold's land ethic in our stewardship and to instill it in others.

Wild lands and the perpetuation of diverse and abundant wildlife are essential to the quality of our American life.

We are public servants. We owe our employers, the American people, hard work, integrity, fairness, and a voice in the protection of their trust resources.

Management, ranging from preservation to active manipulation of habitats and populations, is necessary to achieve Refuge System and FWS missions.

Wildlife-dependent uses involving hunting, fishing, wildlife observation, photography, interpretation, and education, when compatible, are legitimate and appropriate uses of the Refuge System.

Partnerships with those who want to help us meet our mission are welcome and indeed essential.

Employees are our most valuable resource. They are respected and deserve an empowering, mentoring, and caring work environment.

We are a science-based organization. We subscribe to the highest standards of scientific integrity and reflect this commitment in the design, delivery, and evaluation of all our work.

We respect the rights, beliefs, and opinions of our neighbors.

Following the September 11, 2001 terrorist attacks on the U.S., the Department of Interior reviewed all law enforcement programs under its purview. The review of the Refuge System law enforcement program resulted in the 2003 report "Interim and Long-Term Deployment of Law Enforcement Resources of the National Wildlife Refuge System". The report and a subsequent Director's Order called for immediate implementation of several reforms dealing with headquarters and regional structure, zone system implementation, phasing out of collateral duty officers, and centralized recruitment.

During this era, the Refuge System's wildland fire management program grew and matured as a result of a substantial increase in funding at the Departmental level. Growing concerns about the ability of the federal government to respond to such events as hurricanes and other major storms, wildfires, terrorist attacks, etc. led to increased attention being given to emergency

management operations. The Refuge System was given the lead role for Emergency Management within the FWS. Responsibilities include managing or coordinating emergency responses on lands within FWS jurisdiction and assisting other federal and state agencies on adjacent lands as requested. The FWS emergency management role has been most evident in hurricane response where the Refuge Systems boats and equipment are beneficial for rescue and recovery efforts and law enforcement staff can be provided to assist in maintaining order.

The Refuge System Centennial was celebrated in 2003 and numerous special events were held throughout the nation. Public awareness of the Refuge System grew considerably as a result.



Among projects to commemorate the Refuge System Centennial was the Centennial Boardwalk at Pelican Island, the first NWR. An observation deck was installed at the closest point that visitors could view Pelican Island. The boardwalk leading up to it consisted of planks engraved with names and establishment years of NWRs then in the System, sequentially placed according to the date they were added to the Refuge System. New planks continue to be added to the boardwalk as new refuges are added to the System.

During this 23-year-long era, 139 new refuges were added to the System. By its centennial in 2003, the NWRS had grown into the world's largest and most diverse system of lands and waters dedicated to the conservation of fish, wildlife, and plants. It also offers first-class wildlife-dependent recreation. With passage of landmark legislation and continued strong public support, at its centennial in 2003 the Refuge System had grown to include 579 units (542 refuges, 37 wetland management districts (waterfowl production areas in 203 counties), and 50 coordination areas) in 50 states and four territories. It protected 95.5 million acres of lands and waters including 16.7 million acres in the lower 48 states, and nearly 77 million acres in Alaska. Annual visitation during the era grew from 23 to 40 million.

Table 6. Timeline for ERA #6: The System continues to mature (1981-2003)

Overview: The U.S. population grew from 225 (26% rural) to 290 (20% rural) million during this era. This growing population was exerting more and more pressure on wildlife habitats and even already established refuges were increasingly feeling the pressure of activities outside refuge boundaries. This era saw continued growth in the System (139 new refuges) and a broadened approach to stewardship (considering the full suite of fish, wildlife and plants as opposed to focusing mostly on waterfowl). The fire management program was bolstered. National Wildlife Refuge Week was established in 1995. A major management challenge arose in 1989 regarding the allowing of incompatible uses on refuges and a major effort ensued to take corrective actions. Volunteers and "Friends" organizations grew in importance during this era. The System received a much-needed boost from the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) which provided a legislative mission and guidelines for management and growth of the System. The 1998 Fulfilling the Promise effort did much to help operationalize the Improvement Act. At its centennial in 2003, the System contained 95.5 million acres in 542 refuges (76.8 million acres in Alaska, 13.7 million acres in the rest of the states, and 2 million acres in U.S. Territories) plus 3 million acres in the wetlands acquisition program (easements or WPAs in 203 counties). Visitation continued to grow, increasing from 23 to 40 million annually.

1981	<p>Refuge firefighting fatalities: Refuge employees Scott Maness & Beau Sauselein suffered fatal injuries while fighting wildfires on Merritt Island NWR in Florida. This, along with the firefighting death of Richard Bolt in 1979 (see entry at 1979), brought increased attention to fire management within the Refuge System; Representative Sidney Yates, Chair of the Interior Appropriations Subcommittee, championed increased funding in subsequent years to establish a more systematic approach to wildfire management within the Refuge System. Learn more at page 3 of the following publication https://babel.hathitrust.org/cgi/pt?id=umn.31951d006660091&view=1up&seq=1&skin=2021</p>
1981	<p>Refuge Manual updated: A third iteration of the Refuge Manual is produced (first iteration in 1942, second in 1957). It provided a central source of policy, operating guidelines, and technical references for managing the Refuge System. It has been mostly replaced by the FWS Manual. Learn more about the 1981 manual at https://ecos.fws.gov/ServCat/DownloadFile/168681.</p>
1982	<p>Gillett named 15th Refuge System Chief: James G. (Jim) Gillett was born in 1935 in MN and holds a B.S. in wildlife management from the University of Minnesota. He joined the FWS in 1960 and served as refuge manager at several posts in the Midwest including the Mark Twain NWR along the Mississippi River. In 1971 he was assigned to the Washington, DC, headquarters, where he helped guide the refuge system's Wilderness program and several other wildlife management activities. He served as Chief of the Division of Wildlife Management (1980-82) which oversaw the FWS animal damage control program. As Chief of the Division of Refuge Management (1982-1987), Gillett followed in the footsteps of his father, Francis C. Gillett, who was Chief of Refuge Management from 1964 to 1966. FWS Directors during Jim Gillett's tenure were Robert Jantzen (1982-1985) and Frank Dunkle (1986-1987).</p>
1982	<p>First cooperating association: Ding Darling Wildlife Society in Florida is established as the first cooperating association in the FWS. Its Congressionally authorized purpose - to support education, interpretation and research activities of the FWS. The Ding Darling Wildlife Society first met in 1982 and later incorporated as a "Friends" organization. It has grown from an initial 7 to presently over 1,500 members and is recognized for its achievements through the years, among them the construction of a \$3.3 million education center in 1999 that is staffed by the Society. For more information on their activities see https://dingdarlingsociety.org/</p>
1982	<p>First refuge Friends group: While Ding Darling Wildlife Society in Florida was being established, another group of concerned citizens, this time in Minnesota organized to formally establish a non-profit Friends Organization. The Friends of Minnesota Valley received preliminary approval from the Internal Revenue Service in 1982 as a 501(c)(3) tax exempt non-profit corporation. This technically made them the first "Friends Group" in the Refuge System. The 501(c)(3) designation legally established them as an independent entity with the purpose of supporting the goals and programs of Minnesota Valley NWR. Learn more about them at https://www.friendsmnvalley.org/. In the years that followed, many interested</p>

	<p>citizens followed the Ding Darling Wildlife Society and Friends of Minnesota Valley examples and formed Friends organizations. Today there are nearly 200 refuge friends organizations actively contributing to refuge programs in a variety of ways. Formalizing these organizations as legal entities under section 501(c)(3) of IRS codes has proven advantageous to both the Friends organizations and to the FWS. The National Wildlife Refuge Association, Coalition of Refuge Friends and Advocates and the FWS work cooperatively to help Friends organizations achieve mutual goals. For more about present day Friends efforts see https://www.refugeassociation.org/friends, https://coalitionofrefugefriends.com/about/, and https://www.fws.gov/story/friends.</p>
1982	<p>First estimate of volunteer numbers: About 4,950 people volunteered for the FWS, donating an estimated 128,000 hours of time. The large majority of volunteers were helping with various tasks on wildlife refuges. For information on current volunteer opportunities, see https://www.fws.gov/volunteer-opportunity</p>
1984	<p>Wetlands Loan Act extended again: 23 years after the initial "loan", Congress acknowledges that the full loan has not been appropriated and that land acquisition goals for the Refuge System have not yet been met. In response they extended the \$200 million loan.</p>
1984	<p>"Wild Lands for Wildlife" published: "Wild Lands for Wildlife; America's National Refuges" by Noel Grove with photographs by Bates Littlehales was published by the National Geographic Society. Richly illustrated and with a forward by FWS Director Lynn Greenwalt, this is an early "coffee-table" book that tells the story of the Refuge System. The authors describe their visits to some of the more iconic refuges and discuss the "'problems, promise, and pleasures' in one of this nation's least-known treasures--our wildlife refuge system"</p>
1986	<p>Emergency Wetlands Resources Act enacted: This law promoted wetlands conservation including assisting in fulfilling international obligations in migratory bird treaties and conventions. The Act authorized the purchase of wetlands from Land and Water Conservation Fund monies, removing a prior prohibition. It also extended the Wetlands Loan Act authorization through 1988, and forgave previous advances under the Act. It also required the Secretary to report to Congress on wetlands loss, along with an analysis of the role of Federal programs and policies in inducing such losses. It also authorized entrance fees at National Wildlife Refuges, with fee receipts to be allocated 70% to the Migratory Bird Conservation Fund and 30% for operations and maintenance at refuges. Further, it raised the price of Duck Stamps from \$7.50 to \$15.00; and established the Bayou Sauvage NWR, LA.</p>
1986	<p>Western Hemisphere Shorebird Reserves initiated: During the mid-1980s, scientists from the Americas were documenting serious declines in shorebirds. Recognizing that these birds were in trouble prompted the scientists to develop an international strategy About WHSRN – WHSRN to protect shorebirds and their habitats. The strategy was launched in 1986 as the Western Hemisphere Shorebird Reserve network with the designation of the first site, Delaware Bay in the U.S. Of the now 49 units in the U.S., 38 occur on national wildlife refuges.</p>
1986	<p>New EIS on refuge system management initiated: FWS officially initiates the process for developing a new plan for management of the NWRS and begins a programmatic EIS. This was to be an update to the 1976 EIS on operation of the NWRS.</p>
1987	<p>M/V Tiglax begins to ply Alaska waters: Construction was completed on the 120-foot-long M/V Tiglax. As the Refuge System's only ocean-going research vessel, it plays a critical role in meeting Alaska Maritime NWR's research and management needs by supporting managers and scientists from the FWS, universities, the U.S. Geological Survey, the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture and elsewhere. The extensive islands and maritime areas of Alaska Maritime NWR if superimposed on the lower 48 states would stretch from Georgia to California. Learn more at https://www.fws.gov/story/sailing-oceans-alaska</p>
1987	<p>Private lands program initiated: Visionary Refuge System employees who saw the benefit of working beyond refuge boundaries initiated what is now the "Partners for Fish and Wildlife" program. The Partners for Fish and Wildlife Program provides technical and financial assistance to landowners interested in restoring and enhancing wildlife habitat on their land. Projects are voluntary and are custom-designed to meet landowners' needs. Since the program's start, over 50,000 landowners have worked with Partners staff to complete 60,000 habitat restoration projects on 6 million acres. Learn more at https://www.fws.gov/program/partners-fish-and-wildlife</p>

1987	Finley wildlife conservation photography: "William L. Finley: Pioneer Wildlife Photographer" by Worth Mathewson is published. William L. Finley was a passionate conservationist who had a long career in public service for the Oregon Fish and Game Commission. He wrote extensively on wildlife and nature, and took over 200,000 feet of motion pictures, many of them early classics. He is probably best remembered for black and white photographs of birds which he and his friend and colleague Herman Bohlman took between 1900 and 1908. This book reproduces over 200 photographs of outstanding interest from all phases of Finley's career. Learn more at William L. Finley (1876-1953)
1987	Second cooperating association established: San Francisco Bay Wildlife Society in California established as second cooperating association in FWS. Its Congressionally authorized purpose - to support education, interpretation and research activities of the FWS. Learn about their current programs and activities at San Francisco Bay Wildlife Society A not-for-profit organization
1988	Karges named 16th Refuge System Chief: Robert (Bob) Karges was Chief of the Refuge System from 1988-1991. He was born in Fargo, North Dakota in 1937 and holds a BS from Colorado State University in Zoology and post graduate in Forest Recreation. His FWS career started in 1960 as a Wildlife Aid at the Denver Wildlife Research Center. He held refuge positions at the following NWRs beginning in 1961: Monte Vista, Bear River, Washita, Buffalo Lake, Resident Manager Santa Ana and Refuge Manager of Havasu and Wichita Mountains. In 1966 he served on a select FWS committee to address the role of outdoor recreation for wildlife refuges and hatcheries. He was particularly interested in serving on refuges with significant public use and their challenges. He was the Regional Wildlife Biologist for refuges in Albuquerque in the mid-1970s. He is credited with much of the planning and development for the migratory bird land acquisition along the Texas Gulf Coast. The effort resulted in the FWS acquiring more than 100,000 acres of waterfowl habitat. During his tenure as Refuge System Chief, he focused on developing several new initiatives including the Refuge Management Information System, developing a plan for the future (Refuges 2003) and dealing with incompatible uses on refuges. Following his time as Refuge System Chief, he served as Deputy Assistant Regional Director for Refuges and Wildlife in Denver until his retirement in 1993. FWS Directors during his tenure as Refuge System Chief were Frank Dunkle and John Turner.
1988	Draft programmatic EIS released: The Draft EIS "Management of National Wildlife Refuges" was distributed for public review. The process began in 1986 with mailing of 15,000 leaflets inviting participation in public scoping meetings to be held in 10 cities across the country. Nearly 3,000 comments were received with three issues of hunting, natural diversity and contaminants receiving highest interest. The Draft EIS; released in December, 1988; prompted over 33,000 responses. Concerns were raised about the Draft EIS and it was withdrawn by the FWS. A renewed effort to develop a programmatic EIS, designated Refuges 2003 was initiated in 1990. The renewed effort resulted in publication of the draft Refuges 2003 EIS in 1993 (see entry at 1993)
1989	Exxon Valdez oil spill: The Exxon Valdez oil spill occurred in Prince William Sound, Alaska, when the <i>Exxon Valdez</i> oil tanker ran aground and spilled nearly 11 million gallons of crude oil over the next few days. Considered to be one of the worst human-caused environmental disasters, it impacted 1,300 miles of shoreline and was the worst oil spill in the U.S. at that time.
1989	Challenges with incompatible uses: A damning 1989 GAO report was issued (NATIONAL WILDLIFE REFUGES: Continuing Problems With Incompatible Uses Call for Bold Action) RCED-89-196 National Wildlife Refuges: Continuing Problems With Incompatible Uses Call for Bold Action Congressional hearings followed https://play.google.com/books/reader?id=VNjqnhjB8yUC&pg=GBS.PP4&hl=en . In 1990, FWS did its own comprehensive examination of compatibility issues throughout the Refuge System and the FWS report entitled "Compatibility Task Group, U.S. Fish and Wildlife Service, Secondary Uses Occurring on National Wildlife Refuges" confirmed GAO's findings. Lawsuits were filed by several national conservation organizations and the FWS undertook a major nationwide effort to reduce or eliminate incompatible uses.
1990	"Wildlife's Best Friend" published: "National Wildlife Refuges: Wildlife's Best Friend" by Kent Olson is published. It provides a brief overview of the Refuge System along with FWS artist Kent Olson's drawings. Learn more at https://babel.hathitrust.org/cgi/pt?id=umn.31951d02368835z&view=1up&seq=3
1990	Volunteer numbers: The 1990 report of the FWS Director to the Secretary of the Interior indicated 13,775 people donated 1 million hours of labor to the Refuge System. Volunteer activities included

	helping welcome visitors, administrative tasks, helping with fish and wildlife management tasks, and maintenance of vehicles and facilities.
1990	“Greening of Rocky Mountain Arsenal” published: "When Nature Heals: The Greening of Rocky Mountain Arsenal" by Chris Madson with photographs by Wendy Shattil and drawings by Bob Rozinski is published. It tells the story of the cleanup and recovery of a chemical weapons manufacturing facility and its conversion from one of the most toxic waste sites in the country into a National Wildlife Refuge in the suburbs of Denver, CO. Learn more at https://www.fws.gov/refuge/rocky-mountain-arsenal/about-us
1990	“Midnight Wilderness” published: “Midnight Wilderness: Journeys in Alaska's Arctic National Wildlife Refuge” by Debbie Miller published. Midnight Wilderness is a passionate and vivid account of one of Alaska's greatest natural treasures, the Arctic NWR. The author draws on her years of exploring this unique, magical, and expansive territory, weaving chilling adventure, personal anecdote, wildlife observation, and Native American life into a beautiful and compelling memoir of place.
1990	Refuge System stats: As of September 30, 1990, the Refuge System had 464 refuges (88.3 million acres) and waterfowl production areas in 161 counties (1.9 million acres). Recreation visits during FY 1990 were about 26 million. The FY 1990 operations and maintenance budget was \$122.5 million; the workforce included an estimated 2,249 full time equivalents.
1991	Shallenberger named 17th Refuge System Chief: Dr. Robert J. (Rob) Shallenberger was born in 1945 in Massachusetts. He holds a BS from Whitman College in Washington and an MS and PhD from UCLA. He started his FWS career in 1980 as Refuge Manager, Hawaiian and Pacific Islands NWR Complex. He then completed the Departmental Manager Development Program before serving as a wildlife biologist in the Division of Migratory Birds and in the Division of Refuges in Washington, DC. He then became Deputy Assistant Director, Refuges and Wildlife in Portland, OR, and Deputy Assistant Director, Refuges and Wildlife in Albuquerque, NM before returning to Washington DC as Chief, Division of Refuges. Following his tenure as Chief of the Refuge System, he was Refuge Manager, Midway Atoll NWR, HI. Major activities during Shallenberger’s tenure as Refuge System Chief included improving connections between the Washington Office and field units, increasing the visibility of the Refuge System within the FWS, continuing work to eliminate incompatible uses on refuges, and working with various iterations of proposed organic legislation to guide management of the Refuge System. A draft of Refuges 2003, a plan to guide future operations of the Refuge System was released in 1993 that helped shape content in the Refuge System Improvement Act of 1997. A vision for the Refuge System was released as National Policy Issuance 96-10 in 1996; elements from this document helped shape discussions at a first ever national conference on the Refuge System (Fulfilling the Promise) that would be held in 1998. Shallenberger took perhaps greatest pride in his efforts to establish the Cooperative Alliance for Refuge Enhancement which was formed in 1995 as a national coalition of major private conservation organizations interested in preserving the Refuge System for all citizens. FWS Directors during Shallenberger’s tenure as Refuge Chief were John Turner (1991-1993) and Mollie Beattie (1993-1996).
1991	“Refuge” published: "Refuge – An Unnatural History of Family and Place" by Terry Tempest Williams published. It gives the author’s account of dealing with cancer and appreciation of natural wonders of Bear River Migratory Bird Refuge and Great Salt Lake environs in Utah..
1992	Challenges with incompatible uses continue: The Department of the Interior and the FWS are sued by the National Audubon Society, Wilderness Society, Defenders of Wildlife and several Audubon chapters for authorizing or allowing activities on national wildlife refuges that harm fish, wildlife and habitat. The lawsuit is settled shortly thereafter through a settlement that commits the Department and Service to resolve or terminate specific refuge uses that are not compatible with refuge purposes.
1992	Putting Wildlife First published: In 1990 the Defenders of Wildlife assembled an independent Commission on New Directions for the National Wildlife Refuge System. Consisting of 18 respected members of the fish and wildlife conservation community, the Commission produced its report in 1992 entitled “Putting Wildlife First - Recommendations for Reforming Our Troubled Refuge System”. It highlighted long-standing management issues for the Refuge System and made recommendations for organizational and legislative changes. The report is available by request to NWRS.History.Future@gmail.com .

1993	Great Midwest flood: The Great Flood of 1993, one of the most destructive in U.S. history involving the Missouri and Mississippi river valleys, brought considerable attention to the need to refrain from restricting floodplains. It also provided impetus for establishing wildlife refuges in flood prone or storm prone areas.
1993	Refuge guidebook published: "Guide to the National Wildlife Refuges" by Laura and William Riley published. It provides a brief overview of each national wildlife refuge in existence as of 1993.
1993	Refuge Reporter initiated: Jim and Mildred Clark begin to publish the "Refuge Reporter", an independent journal to increase recognition and support for the Refuge System. The quarterly publication highlighted national news and travels of the Clarks as they traveled to refuges across the country. The journal was published for 10 years and included a variety of happenings within the Refuge System.
1993	Draft Refuges 2003 released: The draft EIS/Plan for future management of our National Wildlife Refuge System "Refuges 2003 - A Plan for the Future" was issued by the FWS and public comments were sought. Originally initiated in 1986, this document was the culmination of a several year intensive effort to explore alternative management options for the Refuge System. The document was never finalized as it was overtaken by events that ultimately lead to passage of the National Wildlife Refuge System Improvement Act of 1997. See the draft plan at https://www.google.com/books/edition/Refuges_2003_a_plan_for_the_future_of_th/UZ3gKd1aYROC?hl=en&gbpv=0
1993	"Arctic National Wildlife Refuge" published: "Arctic National Wildlife Refuge" by Penny Rennick discusses the Arctic NWR which has been the focal point of a long-standing, intense and highly publicized struggle between oil developers and conservationists. Pointing to the Prudhoe Bay oil fields as a success story, developers argue for oil exploration and drilling along the arctic coast into the refuge. Environmental factions argue for the preservation of this remaining section of coastal plain, and the granting of a permanent Wilderness designation. This book explores this highly controversial arctic refuge, presenting a non-political overview of the lands, people and history of the area. Included is a historical background for the debate over the Arctic NWR, the history of its exploration, and an introduction to the villages of Kaktovik and Arctic Village and their inhabitants. Special features include a chapter about Margaret (Mardy) Murie, who was instrumental in the establishment of the Arctic National Wildlife Range, and lifelong arctic inhabitant Bella Francis's memories of life on the Porcupine River.
1994	NWRA initiates annual awards program: The Refuge Association began an annual awards program to recognize outstanding contributions to the Refuge System. Starting in 1994 with awards for the Refuge Manager of the Year and Volunteer of the Year, the awards have expanded to also include the Friends Group of the Year, Refuge Employee of the Year, and Advocate of the Year. A full list of award winners is at Past Winners — The National Wildlife Refuge Association .
1994	First training session for Friends organizations: The FWS and "Ding" Darling Wildlife Society host the first training sessions for friends organizations/cooperating associations in Tampa, Florida. The following year, President Bill Clinton issued an Executive Order on the "Management and General Public Use of the NWRS." In a follow-up workshop sponsored by the FWS, "From Executive Order to Collective Action", participants listed Friends organizations as the top priority for strengthening the System.
1994	The National Wildlife Refuges: Theory, Practice and Prospect: A lengthy feature article by Richard J. Fink is published in The Harvard Environmental Law Review (Vol 18, No. 1, pp. 1-135)(available from JSTOR). It discussed legislative history and management challenges of the Refuge System and provided recommended elements of new legislation to guide future management of the System.
1994	Former Chief Reffalt assembles NWRS history: Former Chief of the Division of Refuges William C. (Bill) Reffalt assembles two documents: Historical Chronology – the National Wildlife Refuge System" https://commons.wikimedia.org/wiki/File:Historical_Chronology_of_the_National_Wildlife_Refuge_System.pdf and "A Bibliography of Selected References: History and Development of the National Wildlife Refuge System" https://commons.wikimedia.org/wiki/File:The_National_Wildlife_Refuge_System_(Bibliography).pdf as references for the Refuge Management Academy. The first document gives an 18-page chronology and the second lists over 85 reports or publications with brief annotations for each.

1994	<p>“Seasons of the Wild” published: "Seasons of the Wild - A Journey Through Our National Wildlife Refuges" by John and Karen Hollingsworth is published. It was the result of 7 years of photographing the beauty and extraordinary diversity of habitats and species on refuges. Quality images and associated narrative give glimpses of refuges throughout the 4 seasons in way that captures the magic of Refuge System resources.</p>
1995	<p>National Wildlife Refuge Week established: FWS Director Mollie Beattie designates the second week of October as National Wildlife Refuge Week https://commons.wikimedia.org/wiki/File:National_Wildlife_Refuge_Week_Proclamation.jpg. It has been observed every year since that time. In 1996, National Wildlife Refuge Week was also proclaimed by President Bill Clinton PROCLAMATION 6932—OCT. 7, 1996 111 STAT. 2775 National Wildlife Refuge Week, 1996 including the following statement "I invite all Americans to learn about, appreciate, and celebrate this magnificent collection of lands that we as a people have set aside for wildlife and for the enjoyment of future generations. I also ask all to join me in a renewed commitment to responsible stewardship of our country's irreplaceable natural resources."</p>
1995	<p>Cooperative Alliance for Refuge Enhancement founded: The Cooperative Alliance for Refuge Enhancement (CARE) was formed as a national coalition of 15 major private conservation organizations interested in preserving the Refuge System for all citizens. Although these organizations had varying purposes and perspectives, they recognized that a long history of underfunding was the major challenge for the Refuge System and they shared one common goal: to ensure robust funding to maintain a strong National Wildlife Refuge System. By 2018, the CARE coalition grew to 23 wildlife, sporting, scientific, and conservation organizations that span the political spectrum, representing 16 million Americans who value outdoor recreation and wildlife conservation. A history of this unique partnership was published in 2020, marking the 25th anniversary and is available by request to NWRS.History.Future@gmail.com.</p>
1996	<p>E.O. 12996 issued by President Clinton: Executive Order 12996 “Management and General Public Use of the National Wildlife Refuge System” was issued. It recognized wildlife dependent uses of hunting, fishing, wildlife observation, photography, environmental education, and interpretation as the priority public uses of the Refuge System. The Executive Order recognized both the importance of hunters and anglers to conservation and the growing importance of others who enjoy watching wildlife in wild places, while also making clear that all uses on refuges must first be compatible with the Refuge System’s primary mission: wildlife conservation. Concepts in the EO would be carried forward and incorporated into the Refuge System Improvement Act enacted a year and a half later https://www.govinfo.gov/content/pkg/FR-1996-03-28/pdf/96-7774.pdf</p>
1996	<p>“Promises for a New Century” published: FWS publishes “The National Wildlife Refuge System - Promises for a New Century” Untitled As the beginning of the second century of the Refuge System approached, this document laid out a vision that makes promises for the future, identifies challenges to the Refuge System, and commits to actions that will meet the challenges in order to fulfill the promises. This document was formalized through National Policy Issuance 96-10 NPI 96-10, The National Wildlife Refuge System - Promises for a New Century and provided the framework for the Fulfilling the Promise conference in 1998. The 1996 Refuge System "Promises" paraphrased:</p> <p>Wildlife Promises: 1) Secure the abundance and diversity of our wildlife heritage and be the preeminent land management system conserving and recovering endangered species; and 2) Be leaders in using the best science and technology to manage fish and wildlife.</p> <p>Habitat Promises: 1) Habitats support America's diverse wildlife heritage while including consideration of landscapes beyond refuge boundaries and focusing on environmental health and biological integrity; 2) Be national and international leaders in the art and science of habitat management and Wilderness preservation; and 3) Be demonstration areas for private land wildlife conservation and be models for sound land ethics and use.</p> <p>People Promises: 1) Visitor uses will be wildlife-dependent and compatible in the truest sense of "wildlife first"; 2) Be national treasures for wildlife and its enjoyment - places where visitors and local communities take pride in their stewardship; and 3) Be safe and accessible places where visitors feel welcome and easily know how to enjoy each refuge.</p>

1996	<p>“Friends Initiative” launched: The Refuge System joined the National Wildlife Refuge Association, National Fish and Wildlife Foundation and the National Audubon Society in a partnership called the Friends Initiative to jump start the creation of more refuge support organizations. The National Audubon Society began its Audubon Refuge Keepers program to stimulate citizen action on refuges through local Audubon chapters.</p>
1997	<p>Struggles with organizational changes in FWS: Following a trend in the federal government overall and in the DOI in particular, the FWS in 1995 made organizational changes to implement an “Ecosystem Approach to Fish and Wildlife Management”. The overall goal was to improve natural resource management. The FWS put a new organizational structure in place that divided the nation into 53 geographical areas each with a Geographic Assistant Regional Director charged to lead FWS efforts within that geographic area. Program Assistant Regional Directors remained in place but assumed a staff role with no control of budgets and personnel. The goal of the “Ecosystem Management Approach” was worthy, but the new organizational structure proved to be challenging and at times dysfunctional. Some championed the approach as better focusing on priority needs but many employees were raising concerns about problems of conflicting guidance, inconsistent approaches, poor decision-making, loss of traditional program identity, and questionable application of funds. Refuge System employees in particular had concerns with the organizational changes; one evidence being a 1997 letter to the FWS Director (signed by 125 refuge managers and 3 regional refuge supervisors) that recommended eliminating the new organizational structure and elevating the management of the Refuge System to the Deputy Director level in Washington. The FWS in 1997 contracted an independent assessment of the “Ecosystem Management Approach”; it concluded that the approach was a success but made recommendations for improvement. The FWS adopted many of the assessment’s recommendations in early 1998</p> <p>https://commons.wikimedia.org/wiki/File:Fish_and_Wildlife_Service_Ecosystem_Approach_Assessment.pdf and moved forward in an effort to improve. Dissatisfaction with the ecosystem approach organization within the Refuge System was quite widespread and caused some to think that these challenges were a repeat of earlier struggles experienced throughout much of the history of the Refuge System. A number of individuals, mostly retired Refuge Managers, worked together to establish a non-profit organization (The Blue Goose Alliance) to advocate that the Refuge System become a separate agency within DOI. The premise was that separate agency status is the only way that the Refuge System would have its rightful rank and stature as one of the big 4 land management entities of the federal government (the other 3 being the Forest Service, the National Park Service and the Bureau of Land Management). Chapter 18 of Ed Crozier’s book “Dream Hunter” gives his description of the effort to encourage separate agency status</p> <p>https://openprairie.sdstate.edu/alumni_pubs/5/?fbclid=IwAR3AcvtILRGrZnpCUYaW30_NkjWmut_7FiY8VyoQCMIEKNcQ83-IXmLARmo. Over the next few years challenges of the geographic organization continued and the geographic positions were eliminated. In 2001, the status of the Refuge System within the FWS was elevated somewhat when a new position was created as Assistant Director for the Refuge System (this is the first time that an Assistant Director solely dedicated to the Refuge System was a member of the Directorate [functions as a board of directors for the FWS]).</p>
1997	<p>Coleman named 18th Refuge System Chief: Dr. Richard “Rick” Coleman was the 18th Chief of the Refuge System. Coleman’s formal education included BS and MS degrees in Wildlife Biology from Michigan State University and a PhD in Forestry from Pennsylvania State University. Coleman started his federal career with the National Park Service as an interpreter then a biologist at Everglades National Park and Biscayne National Monument. His Refuge System experience started as Assistant Manager and then biologist at the Hawaii/Pacific Islands NWR Complex. He then served as a biologist in the Refuge Division in Washington DC before becoming Manager of the Don Edwards San Francisco Bay NWR in CA. His last position before becoming Chief of the Division of Refuges was Supervisor of national wildlife refuges in Idaho, Oregon, and Washington. During his tenure as Refuge Chief, he focused on enabling strong working relationships with Friends Groups and on preparations for the Fulfilling the Promise vision conference and follow-on publication. The FWS Director during his tenure was Jamie Rappaport Clark. Following his tenure as Chief of Refuges, he served as Chief of External Affairs for the Portland Region, Chief of Refuges for the Denver Region, and as FWS Science Advisor.</p>

1997	<p>Refuge System Improvement Act enacted: The National Wildlife Refuge System Administration Act of 1966 is amended by the National Wildlife Refuge System Improvement Act of 1997, (P.L. 105-57). This legislation, considered by many to be long overdue, came together through a variety of contributing factors. Among them: 1) challenges of incompatible uses; 2) failure to function as a system; 3) long-standing management issues such as those documented in Secretary Udall's 1968 Advisory Board Report, the 1979 Herbst Report, the 1992 "Putting Wildlife First" Report by Defenders of Wildlife and Richard Fink's 1994 analysis in the Harvard Environmental Review; 4) Congressional hearings on management of the System; 5) proposed legislation (especially that by Senator Bob Graham of Florida); 6) issuance of Executive Order 12996; 7) release of the draft Refuges 2003 EIS; and 8) support from Interior Secretary Bruce Babbitt.</p> <p>Key elements of the Improvement Act: 1) it provides a mission (paraphrased) to administer a national network of lands and waters for the conservation, management, and restoration of fish, wildlife and plant resources and habitat for the benefit of current and future generations; 2) it spells out wildlife conservation as the fundamental mission of the Refuge System; 3) it directs that the biological integrity, diversity, and environmental health of refuges be maintained; 4) it calls for the continued growth and development of the Refuge System; 5) it defines compatible wildlife-dependent recreation as appropriate general public use of refuges; and establishes hunting, fishing, wildlife observation and photography, and environmental education and interpretation as priority uses; 6) it establishes a formal process for determining compatible uses; and 7) it requires comprehensive conservation planning to guide management. Learn more at https://www.congress.gov/bill/105th-congress/house-bill/1420?q=%7B%22search%22%3A%5B%22national+wildlife+refuge%22%5D%7D&s=6&r=5</p>
1997	<p>Comprehensive Conservation Plans: The 1997 Improvement Act called for completion of Comprehensive Conservation Plans to be developed every 15 years. Public input is an important part of this process. Information on the planning process as well as digital files of completed plans are at https://www.fws.gov/library/collections/comprehensive-conservation-plans</p>
1997	<p>National Conservation Training Center opens: The National Conservation Training Center opened its doors in Shepherdstown, West Virginia, providing a comprehensive training center for the FWS. In addition to training programs, a repository of information related to FWS history and heritage is maintained. Learn more at https://www.fws.gov/program/national-conservation-training-center</p>
1997	<p>"Taking Flight" published: "Taking Flight: An Introduction to Building Refuge Friends Organizations" was published by the National Wildlife Refuge Association. (Beverly Heinze-Lacey & Margaret Mehaffey, Editors).</p>
1997	<p>Friends program bolstered: There were 114 Friends organizations in the Refuge System. The Refuge Friends Group Mentoring Program began with 11 refuges participating during the first year. The FWS and National Park Service jointly sponsored the first workshop for refuge managers and park superintendents - Developing and Working with Friends Groups (held at the National Conservation Training Center). The Service began funding the National Wildlife Refuge Friends Group Grant Program, administered by the National Fish and Wildlife Foundation.</p>
1997	<p>Kuralt Trail designated: FWS Director Jamie Clark posthumously awards Charles Kuralt with the Distinguished Citizen Award and establishes the Kuralt Trail (actually a series of trails on 11 National Wildlife Refuges and one National Fish Hatchery in Kuralt's native state of North Carolina) https://commons.wikimedia.org/wiki/File:Charles_Kuralt_Trail.pdf. Among his accomplishments was the popular CBS "Sunday Morning" show which ended with several minutes of video on magnificent features of nature. Many of these segments were filmed on National Wildlife Refuges.</p>
1998	<p>First nationwide NWRS conference held: The first-ever Systemwide conference of the Refuge System was held in Keystone, CO. Attended by every refuge manager in the country, other FWS employees, and scores of conservation organizations the result was publication of "Fulfilling the Promise - The National Wildlife Refuge System Visions for Wildlife, Habitat, People, and Leadership". Follow-on work groups further defined and developed implementation elements to improve the Refuge System. Results of the conference were published at https://ecos.fws.gov/ServCat/DownloadFile/51005</p>
1998	<p>Refuge Roads added to Federal Transportation program: The 1998 Transportation Equity Act for the 21st Century (TEA-21) recognized the Fish and Wildlife Service and its "refuge roads" as a new partner in the Federal Lands transportation program. This program is authorized and funded</p>

	within the U.S. Transportation Department and provides support for roads, trails, and associated transportation components available to the public. Typically, legislation reauthorizing this program is re-enacted about every 5 years.
1998	NWRS volunteer act enacted: The National Wildlife Refuge Volunteer and Community Partnerships Act authorizes partnerships with organizations to promote the understanding and conservation of fish, wildlife, plants and cultural resources on refuges and directs the Service to develop educational programs. Learn more at https://www.congress.gov/bill/105th-congress/house-bill/1856?q=%7B%22search%22%3A%5B%22volunteer+and+community+partnerships+act%22%5D%7D&s=8&r=605
1999	Kurth named 19th Refuge System Chief: Jim Kurth was the 19th Chief of the Refuge System. He was born in Iowa and grew up in Ohio. He earned a degree in wildlife management from the University of Wisconsin-Stevens Point. Before being selected as Chief of the Division of Refuges, Kurth managed the Arctic NWR, AK. He began his Refuge System career in 1979 and held posts at Mississippi Sandhill Crane NWR in MS, Arthur R. Marshall Loxahatchee NWR in FL, Bogue Chitto NWR in LA, Seney NWR in MI, and Ninigret NWR in RI. Management priorities during his tenure focused on promoting leadership development within the Refuge System ranks, implementing initiatives being identified in the Fulfilling the Promise visioning process and implementing provisions of the recently enacted Refuge Improvement Act. The FWS Director during this time was Jamie Rappaport Clark. Kurth continued in Refuge System leadership positions beyond this 2-year stint as Chief of the Division of Refuges.
1999	“From behind the Blue Goose Sign” published: “From behind the Blue Goose Sign: Forty years on nine western state and federal wildlife refuges” by Edward J. O’neil is published. It contains the author’s memoirs of working at various locations in Utah, and at Muleshoe (TX), Salton Sea (CA), Sacramento (CA), and Tule Lake (CA and OR) NWRs.
2000	E.O. on Marine Protected Areas issued: Executive Order 13158 is issued to strengthen and protect the significant natural and cultural resources of Marine Protected Areas. It established a nationwide network of protected areas coordinated by the National Oceanic and Atmospheric Administration. The Refuge System has 106 units under this designation. Presidential Documents .
2000	“Duck Stamp Story” published: “The Duck Stamp Story: Art, Conservation, History” by Eric Dolin and Bob Dumaine is published. It provides an excellent history of waterfowl declines and conservation and the role of Duck Stamps in preserving our waterfowl heritage. A must read for those interested in the Refuge System. Additional information on Duck Stamps is also available at https://www.fws.gov/program/federal-duck-stamp and Friends of the Migratory Bird/Duck Stamp Working to Support the Federal Duck Stamp . A 2014 movie of the Duck Stamp Art Competition, the only annual art competition sponsored by the federal government, is at https://www.youtube.com/watch?v=AfaYy9wf8EA
2000	Refuge System stats: As of September 30, 2000, the Refuge System had 521 refuges (90.6 million acres) and waterfowl production areas in 200 counties (2.6 million acres). Recreation visits during FY 2000 were 36.5 million. The FY 2000 operations and maintenance budget was \$261 million; the workforce included an estimated 2,812 full time equivalents.
2000	Improvement Act article published: “The National Wildlife System Improvement Act of 1997: Defining the National Wildlife Refuge System for The Twenty-First Century” by Cam Tredennick is published in the Fordham Environmental Law Journal. It provides a good overview of the history of the Refuge System and the strengths embodied in the Improvement Act of 1997. The article can be accessed at https://ir.lawnet.fordham.edu/elr/vol12/iss1/2/ .
2000	Refuge System Centennial Act enacted: The Refuge System Centennial Act was passed as part of PL 106-408. The purpose of the legislation was to: (1) to establish a commission to promote awareness by the public; (2) to develop a long-term plan to meet the priority needs; (3) to require an annual report on the needs of the System; and (4) to improve public use programs and facilities. The law and the associated committee reports are available here https://www.congress.gov/bill/106th-congress/house-bill/3671/text While the Centennial drew considerable attention to the Refuge System, the long-term plan to meet priority needs of the Refuge System was drafted but never finalized.

2000	<p>Murie Symposium: A symposium was held at the Murie Ranch in Moose, Wyoming to commemorate the conservation work of Olaus and Mardy Murie. Proceedings of the symposium entitled “The Muries: Voices for Wilderness and Wildlife: Sustaining the Legacy” are available at https://commons.wikimedia.org/wiki/File:Murie_Symposium_Proceedings.pdf</p>
2001	<p>Ashe named 20th Refuge System Chief: Dan Ashe was the 20th Chief of the Refuge System and the first Refuge Chief to be a member of the FWS Directorate. He was born in 1956. He has a BS in biological science from Florida State University, and a Marine Affairs degree from the University of Washington. Before becoming Refuge System Chief, his prior positions included being a member of the staff of the Committee on Merchant Marine and Fisheries (1982–95), the FWS Assistant Director for External Affairs (1995-1998) and the FWS Assistant Director for Refuges and Wildlife (1998-2001). As Assistant Director for Refuges and Wildlife, Ashe had oversight for the Refuge System during 1998-2001; however, consistent with the term Chief of Refuges used here as the administrator with the sole and undivided responsibility for Refuge System administration, Ashe was Chief of Refuges from 2001 to 2003. The organizational realignment in 2001 elevated the Chief of Refuges to the Directorate level (essentially the functional board of directors for the agency) for the first time in FWS history. From 1998 to 2003, Ashe was a champion for the Refuge System and played key roles in implementing Fulfilling the Promise vision components, negotiating provisions of the Refuge System Improvement Act of 1997, and raising the visibility of the Refuge System as it approached its centennial in 2003. The FWS Directors during this time were Jamie Rappaport Clark and Steve Williams. Following his tenure as Chief of Refuges, Ashe served as the FWS Science Advisor and was FWS Director (2011-2017). In 2017, Ashe became President and CEO of the Association of Zoos and Aquariums.</p>
2001	<p>Fire program bolstered: Congress provided substantial new funding totaling \$979 million in FY 2001 for wildland fire management across DOI. These funds were in the BLM budget for use across the Department. Along with this money came Congressional direction for aggressive action to reduce risk of wildfire in the wildland urban interface, as well as demands for increased consistency, accountability, and stakeholder engagement in implementing the Department’s Wildland Fire Management Program. To achieve these objectives the Interior Secretary created the Office of Wildland Fire Coordination. Responsibility for managing DOI’s wildland fire account was transferred from the BLM to OWFC in 2008. The current wildland fire management programs are described at We Support Wildland Fire Management for DOI and at https://www.fws.gov/program/fire-management for the FWS</p>
2001	<p>September 11 terrorist attacks: On 9/11/2001, 19 militants associated with the Islamic extremist group al Qaeda hijacked 4 airplanes and carried out suicide attacks against targets in the U.S. Two of the planes were flown into the twin towers of the World Trade Center in New York, a third hit the Pentagon just outside Washington, D.C., and the fourth (Flight 93) crashed in a field in Shanksville, Pennsylvania. Almost 3,000 people were killed during the 9/11 terrorist attacks, which triggered major U.S. initiatives to combat terrorism. Refuge manager Richard Guadagno was aboard flight 93 and has been hailed as a hero as he is believed to be among the passengers who attempted to overcome the hijackers and thereby did not allow the plane to reach its intended target. Learn more at Remembering Rich Guadagno 1962-2001 and Fish & Wildlife News: October/November/December 2001</p>
2001	<p>Blue Goose Alliance founded: The nonprofit Blue Goose Alliance was established to recommend elevating the stature and strengthening the integrity of the Refuge System by elevating the Refuge System as a its own agency within the Interior Department. They point out that: 1) The Refuge System, the nation’s 3rd largest land managing entity, is administratively buried in the FWS; with its many diverse responsibilities, the FWS can offer leadership for Refuges only on a part-time basis. 2) The Refuge System, larger than the National Park Service, cannot compete in the same arena with other resource agencies for its fair share of funds to meet its responsibilities. and 3) Several major studies over the past 30 years have recognized organizational deficiencies as a major problem for the Refuge System. Internal reorganization efforts have been ineffective and separate agency status is advocated as the ultimate solution.</p>
2001	<p>“Last Wilderness – Arctic NWR” published: “The Last Wilderness: Arctic National Wildlife Refuge” by Kennan Ward published. Documents the remote wilderness, wild plants, scenic rivers and rarely seen wildlife, starting in 1987 with updates through summer 2001. The book concerns the most controversial and debated lands in North America. Perhaps more important than wildlife numbers is the fact that the refuge is one of the last places on earth where human impact is nearly non-existent. It is a</p>

	place where nature's interactions are still intact, where wilderness endures. Kennan Ward's photographs provide potent testimony that the Arctic Refuge is truly exceptional.
2002	First national Friends conference: The first national conference specifically for members of Friends groups was hosted by the Refuge System and the National Wildlife Refuge Association. The event was a marked success and annual conferences were held in a number of subsequent years. In 2008, nearly 300 refuge Friends joined 150 FWS staff for the 5th National Friends Conference, the largest ever. For information on current Friends activities see Friends
2002	“Taking Flight” updated: The National Wildlife Refuge Association produces an updated edition of "Taking Flight: An Introduction to Building Refuge Friends Organizations" (Beverly Heinz-Lacey, lead author), a handbook for starting and operating a Refuge Friend's Organization. It was foundational to many Friend's groups and has many principles that are still applicable today. https://static1.squarespace.com/static/5c2a3500f793923866cf19b8/t/614cc83cde14ff1cf61bd131/1632421952751/Taking%20Flight%202002.pdf
2003	Hartwig named 21st Refuge System Chief: Bill Hartwig was the 21st Chief of the Refuge System. Born in California in 1946, he holds a BS in Outdoor Recreation from West Virginia University and an MS in Administration from George Washington University. Hartwig began his Federal service in the US Army as Artillery Captain/Ranger Advisor in the Republic of Vietnam. He began his Department of the Interior career in the Bureau of Outdoor Recreation as a Federal Lands specialist. After a five-year stint in the Office of the Assistant Secretary Fish, Wildlife and Parks as the Staff Director to the Federal Land and Water Conservation Fund Lands Planning Group he began his FWS career as Chief of Realty in Washington, D.C. He served 5 years there before becoming Deputy Assistant Director for Refuges and Wildlife in 1991. He acted as Assistant Director for Refuges and Wildlife from January 1994 until becoming Regional Director for the Twin Cities Region in April 1995. He served in that role until being named Chief of the Refuge System in 2003. Priorities during his time as Refuge Chief related to celebration of the Refuge System Centennial, continued implementation of Fulfilling the Promise initiatives, raising visibility of the Refuge System, and holding a Conservation in Action Summit in 2004 to highlight key conservation and recreation responsibilities. The FWS Director during Hartwig's tenure as Chief was Steve Williams.
2003	Refuge law enforcement report completed: The report "Interim and Long-Term Deployment of Law Enforcement Resources of the National Wildlife Refuge System" is completed. It resulted from increased attention to law enforcement following the 9/11/2001 terrorist attacks. Subsequent to that event, there was a DOI Secretary review of the Refuge System law enforcement program. Also, the Refuge System contracted with the International Association of Chiefs of Police to analyze the system's law enforcement program. The report and a subsequent Director's Order called for immediate implementation of several reforms dealing with headquarters and regional structure, zone system implementation, collateral duty officer reforms, and centralized recruitment. For information on the current refuge law enforcement program see https://www.fws.gov/program/refuge-law-enforcement
2003	Refuge System stats: As of September 30, 2002, the Refuge System contained 577 units (540 refuges, 37 wetland management districts (waterfowl production areas in 203 counties that encompass a total of 2.9 million acres). In addition, it included 50 coordination areas (managed under agreement by states). The NWRS protected a total of 95.3 million acres of lands and waters including 16.7 million acres in the lower 48 states, and nearly 77 million acres in Alaska. Annual visitation during FY 2003 was 40 million. The annual operations and maintenance budget was \$368 million and staffing included 2,964 full-time equivalents. Over 38,000 people volunteered on refuges, donating over 1.4 million hours of time.
2003	“Alaska National Wildlife Refuges” published: Alaska Geographic publishes “Alaska's National Wildlife Refuges” by Bruce Woods that describes the establishment and natural resources of national wildlife refuges in our 49th state.
2003	Special edition of FWS News: FWS publishes a Special Edition of the Fish and Wildlife News “National Wildlife Refuge System Centennial”. It celebrates the System's first 100 years and looks to the future while describing the passion that employees and volunteers have for conserving nature through the Refuge System. Learn more at " Fish & Wildlife News: Spring 2003 (Special Edition) "
2003	NWRS Centennial: The Refuge System observes its centennial. Many events were held and the Refuge System received considerable public attention. The long-term plan called for in the Refuge

	<p>Centennial Act to address the National Wildlife Refuge System's major operations, maintenance and construction needs nationwide was drafted by the FWS but was not issued by the Department. For snippets on the centennial see</p> <p>https://commons.wikimedia.org/wiki/File:America%27s_NWRS_a_Century_of_Conservation.pdf, https://commons.wikimedia.org/wiki/File:Centennial_Perspectives_from_Alaska_Maritime_NWR.pdf, https://commons.wikimedia.org/wiki/File:America%27s_National_Wildlife_Refuge_System_Celebrating_a_Century_of_Conservation.pdf, and the special edition of Wild Earth Magazine https://www.environmentandsociety.org/mml/wild-earth-13-no-4</p>
2003	<p>NWRS conservation through law published: "The National Wildlife Refuges: Coordinating A Conservation System Through Law" 2nd Edition by Robert L Fischman is published. It examines the laws and policies governing management of the national wildlife refuges, offering a description and analysis of the management approach outlined in the 1997 National Wildlife Refuge System Improvement Act.</p>
2003	<p>Smithsonian Book of NWRs published: "Smithsonian Book of the National Wildlife Refuges" by Eric Jay Dolin is published. It describes in considerable detail the origins of the Refuge System through its approaching 100th anniversary in 2003. The author unveils a story filled with heroic, sometimes quirky, Americans who fought to preserve the nation's natural heritage. Richly illustrated with photos from John and Karen Hollingsworth, this book is a must read for those interested in the history and management of the Refuge System.</p>
2003	<p>"Lands of Promise" published: "America's Wildlife Refuges: Lands of Promise" by Jeanne Clark and Tom Leeson is published. It honors the centennial anniversary and incredible success stories of our nation's wildlife refuges. Larger than our National Park System, the Refuge System is the largest system of lands in the world dedicated to placing "wildlife first." Represented in every state and visited annually by more than 34 million people, there are 538 refuges covering nearly 95 million acres that provide protected habitat for over 2,100 species of animals, including 260 of our most imperiled species.</p>
2003	<p>Seasons of Arctic NWR published: "Arctic National Wildlife Refuge: Seasons of Life and Land" by Subhankar Banerjee is published. It provides a comprehensive photographic documentation of the biodiversity and indigenous cultures of the Arctic NWR (120 full-color photographs).</p>

Era #7: STRENGTHENING THE MARINE DIMENSION (2004-2022)

This era marks the roughly 2 decades since the centennial of the National Wildlife Refuge System. During this time, the U.S. population grew from 290 (20% rural) to 333 (17% rural) million. The pressures of the growing human population continued to stress the country's natural resources. Worldwide population pressures brought concerns about stressors such as sea level rise, and climate instability. Our world's oceans, once thought to be too immense to be adversely impacted by human activity, were being found to be under stress in a variety of ways. The increasingly overwhelming proportion of our population living in urban areas has raised concerns about people being too separated from nature and has also increased demand for refuge visitation.

2004 was a busy year for the Refuge System. The Conservation in Action Summit was held to engage partners in identifying priorities for the second century of the System. The Refuge Update, a bi-monthly newsletter on happenings within the Refuge System was launched. Results of a symposium on managing the biological integrity, diversity, environmental health (a key component of the Refuge System Improvement Act) of the Refuge System was published.

On a government-wide basis, 2004 saw initiation of new efforts to improve management of constructed real property when Presidential Executive Order 13327 was issued. It ushered in a concerted effort within the Department of the Interior and the Refuge System to identify constructed assets, determine their condition, and focus funds on assets most important to mission delivery. Within the Refuge System, these structures underpin every management function including wildlife and habitat management, fire management, law enforcement, and public access and associated wildlife-dependent recreation. Perhaps most critical within the Refuge System is an extensive inventory of water management structures such as levees, dikes, water level control structures, and pumping stations that enable management of over a million acres of wetland impoundments each year. Refuge employees are world leaders in wetland management for wildlife (see the following publication for principles involved https://archive.org/details/doi-report_i-4966148).



Water control structures enable refuge employees to create suitable wetland habitats for a multitude of wildlife; they are essential tools for many refuges. The above photos of a structure at Great Dismal Swamp NWR, VA shows the structure before installation (left) and refuge staff adjusting the level of the completed structure using aluminum “boards” (right).

The table that follows summarizes metrics of constructed assets within the Refuge System as of September 30, 2019. Maintaining these structures in good working condition is essential to the success of the Refuge System.

Refuge System Constructed Facility Assets

Asset Grouping	Asset Count		Replacement Cost		Deferred Maintenance	
	Quantity	% of Total	\$ Millions	% of Total	\$ Millions	% of Total
Buildings	5,204	14 %	\$4,424	11 %	\$267	26 %
Water Management Structures	8,407	23 %	\$15,720	41 %	\$344	33 %
Roads, Bridges, and Trails	15,257	41 %	\$14,792	38 %	\$242	23 %
Other Structures	8,414	23 %	\$3,687	10 %	\$186	17 %
TOTAL	37,282	100 %	\$38,623	100 %	\$1,039	100 %

"Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder" by Richard Louv was published in 2005. This seminal book links the absence of nature in the lives of today's wired generation to some of the most disturbing childhood trends: the rise in obesity, attention disorders, and depression. This book brought together a body of research indicating that direct exposure to nature is essential for healthy childhood development and for the physical and emotional health of children and adults. Others had similar observations and considerable interest was shown in the ability of the Refuge System to counter these trends by providing opportunities especially for youth to improve the quality of their lives by increasing their exposure to nature. Wildlife refuge public use programs provide one obvious means for reducing our nation's "nature deficit disorder" and improving the quality of life for our citizens.

An independent analysis of the effectiveness of the Refuge System in meeting its mission https://commons.wikimedia.org/wiki/File:Independent_Evaluation_on_Effectiveness_of_the_National_Wildlife_Refuge_System_Summary_Overview.pdf https://commons.wikimedia.org/wiki/File:Independent_Evaluation_on_Effectiveness_of_the_National_Wildlife_Refuge_System.pdf was concluded in 2008. Project managers analyzed the effectiveness of accomplishing the 12 goals in the 2007 Strategic Plan for the Refuge System. They concluded that the Refuge System was highly effective in meeting 1 goal, effective in meeting 4 goals, partially effective in meeting 4 goals, ineffective in meeting 2 goals, and that effectiveness for 1 goal could not be determined. Biggest challenges in meeting goals were inadequate budgets and staffing and heavy burdens of administrative reporting requirements.

The American Recovery and Reinvestment Act of 2009 was a government-wide economic stimulus program enacted by the 111th U.S. Congress and signed into law by President Obama. Developed in response to the Great Recession of 2008, its primary objective was to save existing jobs and

create new ones as soon as possible. It provided the Refuge System an influx of about \$210 million which provided for much needed repair or improvements to refuge facilities.

Perhaps most noteworthy in the first decade of the Refuge System's second century is the interest in conserving our nation's increasingly threatened marine resources. Many refuges are located on or near coastal areas, so the Refuge System has always had some involvement in the stewardship of marine resources. Executive Order 13158 issued in 2000 to strengthen and protect the significant natural and cultural resources of Marine Protected Areas established a nationwide network of protected areas coordinated by the National Oceanic and Atmospheric Administration. The Refuge System today has 106 units under this designation. This stewardship role for marine resources expanded dramatically when four Pacific Marine National Monuments were added to the Refuge System. The first was Papahānaumokuākea Marine National Monument, established in 2006 by President George W. Bush, who was influenced to establish the Monument after viewing this 2 part film series, "Voyage to Kure" <https://www.youtube.com/watch?v=liT7kePNKSg> and https://www.youtube.com/watch?v=W9hlif_mMh4 by Jean-Michel Cousteau. It is the single largest conservation area under the U.S. flag, and is one of the largest marine conservation areas in the world. This Marine National Monument was expressly created to protect an exceptional array of extensive coral reefs, small islands and shallow water environments sheltering over 7,000 marine species and cultural sites significant to Native Hawaiians. It received further recognition in 2010 when it was designated as a World Heritage Site by the United Nations.



*Rose
Atoll*

Three additional Marine National Monuments were established in the Pacific by President George W. Bush in 2009:

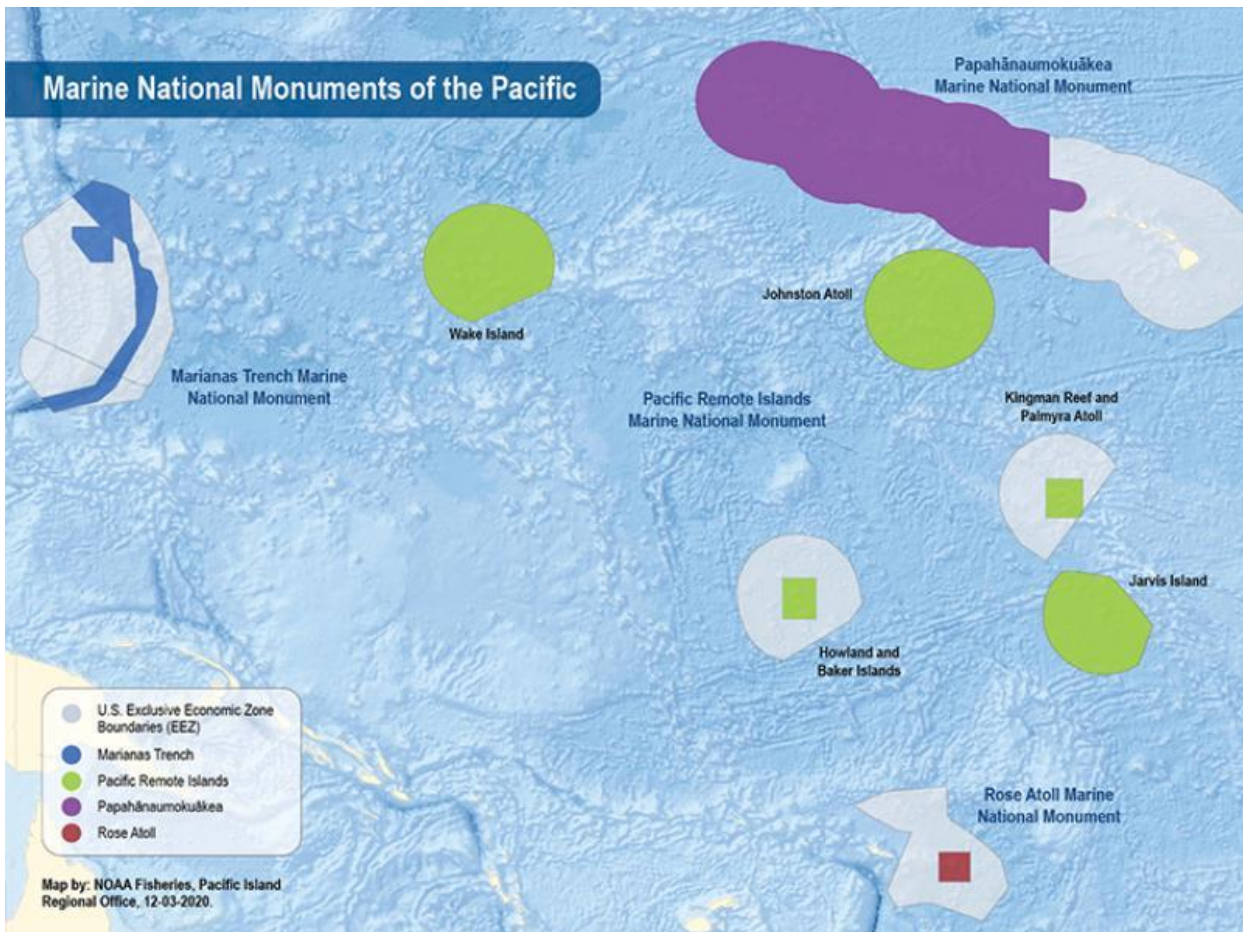
- The Pacific Remote Islands Marine National Monument is southwest of Hawaii and includes Wake, Baker, Howland and Jarvis Islands; Johnston Atoll; Kingman Reef; and Palmyra Atoll wildlife refuge.
- Rose Atoll Marine National Monument is east of American Samoa and is the southernmost point of the U.S. It sustains many endemic species, including corals, fish, shellfish, marine mammals, seabirds, water birds, land birds, insects, and vegetation not found elsewhere.
- The Northern Mariana Islands National Monument, which includes the Mariana Trench, the deepest canyon on Earth. Among its diverse and remarkable underwater features are one of only two known boiling pools of liquid sulfur and huge, active mud volcanoes.

President Obama issued Presidential Proclamation 9173 in 2014 and Proclamation 9478 in 2016 that greatly expanded the Pacific Marine National Monuments. With these expansions, the Pacific Marine National Monuments now contain approximately 737.6 million acres. In addition, the Refuge System is the designated manager for another 19.1 million acres of Pacific Marine National Monument areas under authorities other than the Refuge System Administration Act.



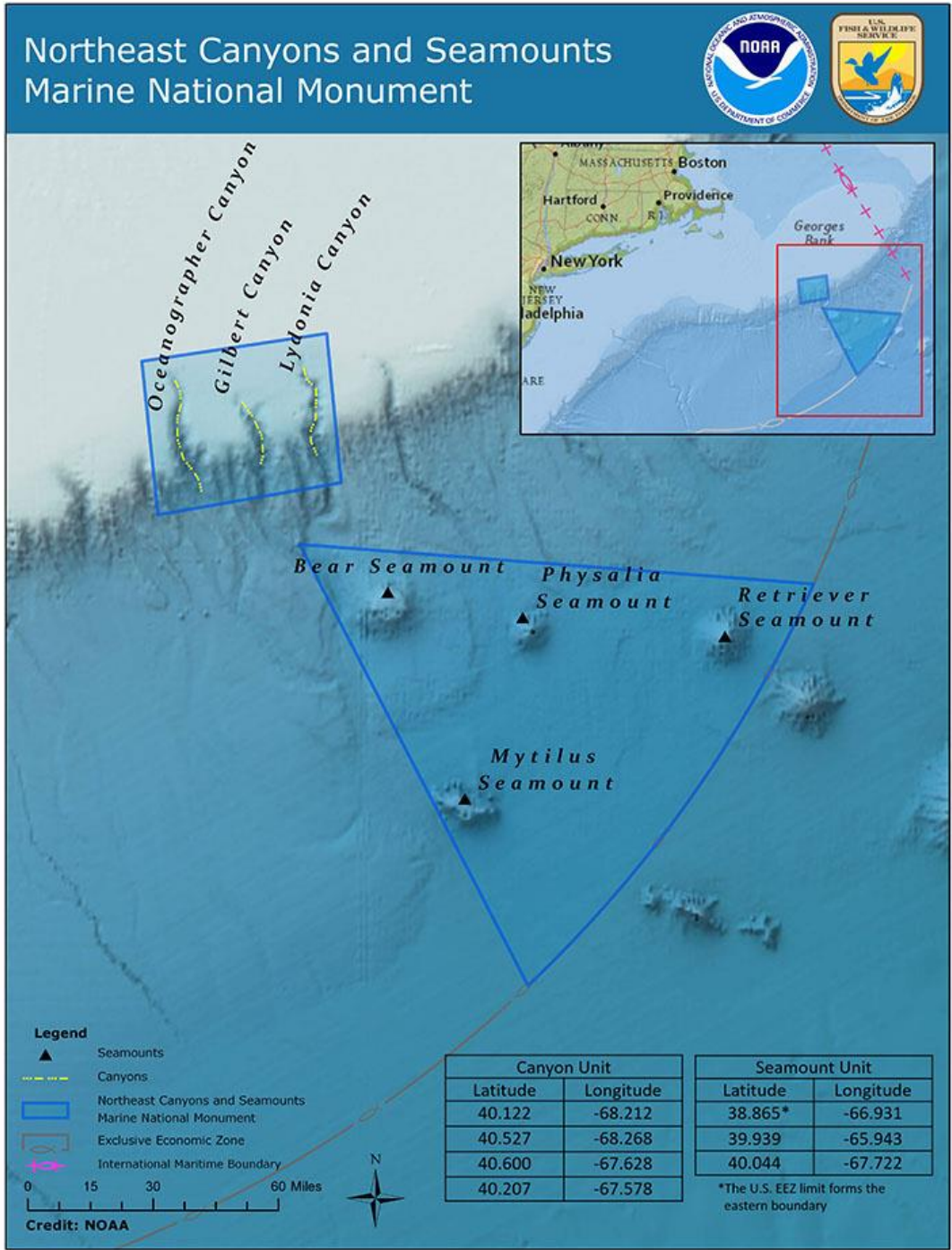
Nesting albatross at Midway Atoll, part of Papahānaumokuākea Marine National Monument.

The below map displays the immense size and distribution of the Marine National Monuments of the Pacific. The collective area of these monuments is roughly equivalent to 40% of the area of the 48 contiguous states.



President Obama established the Northeast Canyons and Seamounts Marine National Monument in 2016 by Presidential Proclamation 9496. Located about 130 miles off the coast of Cape Cod, Massachusetts (see map below); it is approximately the size of Connecticut (3.1 million acres) and is the only marine national monument in the Atlantic Ocean. The monument is renowned for its rich

and unique biodiversity, including deep-sea coral communities and concentrations of marine wildlife. Its geographic features create oceanographic conditions that concentrate ocean-dwelling animals including whales, dolphins, and turtles, as well as fishes that migrate long distances, such as tunas, billfish, swordfish, and sharks. A large number of seabirds also rely on this area for foraging.



Additional information on the 5 Marine National Monuments in the Refuge System is available at <https://www.fws.gov/story/hope-spots-ocean> and <https://www.youtube.com/watch?v=KyWwQV9y29k>.

Marine National Monuments in the Refuge System	Acres
NE Canyons and Seamounts MNM (Atlantic)	3,144,320
Marianas Trench MNM (Pacific) Includes: Mariana Arc of Fire NWR [46,780 acres] Mariana Trench NWR [50,532,102 acres] Other than NWRSAAs ¹ [10,498,787 acres]	61,077,668
Rose Atoll MNM (Pacific) Includes: Rose Atoll NWR [1,613 acres] Other than NWRSAAs ¹ [8,607,432 acres]	8,609,045
Pacific Remote Islands MNM (Pacific) Includes: Baker Island NWR [413,416 acres] Howland Island NWR [422,361 acres] Jarvis Island NWR [434,697 acres] Johnston Atoll NWR [567,289 acres] Kingman Reef NWR [487,016 acres] Palmyra Atoll NWR [533,110 acres] Wake Atoll NWR [497,750 acres] Other NWRs managed [310,586,212 acres]	313,941,851
Papahānaumokuākea MNM (Pacific) Includes: Hawaiian Islands NWR [254,418 acres] Midway Atoll NWR [580,740 acres] Other NWRs managed [372,013,439 acres]	372,848,597
TOTAL AREA	759,621,481

¹ These areas are managed under authorities other than the National Wildlife Refuge System Administration Act (NWRSAAs). Thus they are not formally a part of the Refuge System but in practice are managed by the Refuge System so are displayed here.

In 2011, the FWS published “Conserving the Future: Wildlife Refuges and The Next Generation”. It describes the results of a strategic engagement and visioning process to best meet challenges to implementing the Refuge System Mission. A total of 24 recommendations for action were identified and follow-up actions initiated. Recommendations focus on 3 components:

1. **Manage Wildlife and Wild Lands** - Embrace a scientific, landscape-level approach to conserving, managing and restoring refuge lands and waters, and work to facilitate conservation benefits within as well as beyond refuge boundaries
2. **Promote a Connected Conservation Constituency** - Make wildlife conservation more relevant to American citizens and foster their engagement in and support of the Refuge System. As with land protection and management actions, we will be most effective by working with our traditional partners as well as embracing new ones. Recommendations include expanding community partnerships; encouraging volunteerism; embracing urban America (over 100 refuges are within 25 miles of an urban population of over 250,000); telling the conservation story in new ways with the help of technology; and enhancing opportunities to connect people and nature
3. **Lead Conservation into the Future** - Encourage the entire FWS to be self-critical and continually strive to maximize conservation delivery and demonstrate excellence in the stewardship of public funds; strive for a diverse, inclusive, competent and caring workforce that commits to conservation, embraces the responsibility of public service, and succeeds in realizing this in effective, efficient and innovative ways

Continued appreciation of the Refuge System is demonstrated by the fact that visitation increased to 65 million visits by FY 2021. Also in 2019, the John D. Dingell, Jr. Conservation Management and Recreation Act was signed into law. Among other provisions, it permanently reauthorized the Land and Water Conservation Fund (LWCF) which authorizes funding to acquire new refuge lands. In 2020, the Great American Outdoors Act was enacted. It includes 2 provisions of major import to the Refuge System: 1) It provides \$95 million per year over 5 years to repair facilities such as visitor centers, boardwalks and trails, and water management structures; and 2) It provides full, dedicated funding of the LWCF at \$900 million each year in perpetuity (The Refuge System is expected to roughly double its land acquisition budget with the enactment of this law.)

During this roughly 2-decade era, 25 units were added to the Refuge System but the growth in area was tremendous. Over 759 million acres in marine habitats were added, 756 million acres in the Pacific and 3 million in the Atlantic. Over 2 million acres were added in the lower 48 states. By September 30, 2022, the Refuge System included 611 units (568 refuges, 5 Marine National Monuments, and 38 wetland management districts [211 waterfowl production area counties]). It protects 856 million acres of lands and waters, including 759 million acres of marine areas (includes 19 million acres managed by the Refuge System under authorities other than the Refuge System Administration Act), 77 million acres in Alaska, and 19 million acres in the lower 48 states (14.4 million acres on refuges and 4.3 million acres in wetland management districts). Public visitation continued to climb, expanding from about 40 million visits in FY 2003 to 65 million by FY 2021.

"What a country chooses to save is what a country chooses to say about itself."
- Mollie Beattie (FWS Director 1993-1996)

Today's Refuge System (September 30, 2022 data) has been assembled through a variety of different administrative and funding mechanisms. Setting aside the sections of Marine National Monuments outside refuge boundaries (685.7 million of the 759 million total acres in Marine National Monuments), leaves 151 million acres of the more traditional Refuges and Wetland Management Districts. These 151 million acres were acquired as follows:

- 93% (140 million acres) was withdrawn from the public domain or transferred from another federal entity (within this amount, 1.2 million acres of former military bases have become part of the Refuge System)
- 4% (6 million acres) was acquired using funds from the popular "Duck Stamp" program
- 1.14% (1.7 million acres) was acquired with funds from the Land and Water Conservation Fund
- 0.46% (694 thousand acres) was acquired using other funds
- 1.13% (1.7 million acres) was acquired through donations (although relatively modest in terms of acreage [0.27% of refuge acres and 9.3% of wetland management district acres] it is worth noting that 58% of refuges and 70% of the counties in wetland management districts had land donated to them)



A school of red Hawaiian squirrelfish, or 'ala'ihī, at Papahānaumokuākea Marine National Monument.

“Those who contemplate the beauty of the earth find reserves of strength that will endure as long as life lasts. There is symbolic as well as actual beauty in the migration of the birds, the ebb and flow of the tides, the folded bud ready for the spring. There is something infinitely healing in the repeated refrains of nature - the assurance that dawn comes after night, and spring after the winter. The lasting pleasures of contact with the natural world are not reserved for scientists but are available to anyone who will place himself under the influence of earth, sea, and sky and their amazing life.”

- Rachel Carson in “The Sense of Wonder” 1956

Table 7. Timeline for ERA #7: Strengthening the marine dimension (2004-2022)

Overview: During this era, the U.S. population grew from 290 (20% rural) to 333 (17% rural) million. The pressures of the growing human population continued to stress the country’s natural resources. Worldwide population pressures brought concerns about stressors such as sea level rise, and climate instability. Our world’s oceans, once thought to be too immense to be adversely impacted by human activity, were being found to be under stress in a variety of ways. The increasingly overwhelming proportion of our population living in urban areas raised concerns about people being too separated from nature and also increased demand for refuge visitation. The concern that the world’s oceans are under great stress led to efforts to expand protection of marine habitats. Over 759 million acres of marine habitats in the form of Marine National Monuments were added to the Refuge System during this era. The growing contributions of volunteers and "Friends" organizations received increased attention during this era. The 2011 "Conserving the Future: Wildlife Refuges and the Next Generation" helped focus on actions needed to best meet the Refuge System mission. During this era, 28 new refuges were established; 1.1 million acres were added to refuges and 1.3 million acres were added to the wetlands acquisition program. Most notably, 759 million acres of marine habitats were added in 5 Marine National Monuments. This brings the present (9/30/2022) Refuge System to 856 million acres.

2004	<p>Conservation In Action Summit: More than 250 people met at NCTC for the Conservation in Action Summit to help develop a shared sense of priorities to guide the Refuge System as it entered its second century. Discussions focused on 5 topical areas: 1) leadership, 2) science, 3) strategic growth, 4) wildlife-dependent recreation, and 5) wildlife and habitat. Over the Summit's three and a half days, more than 250 people engaged in conversations about setting priorities for the System. Participants hailed from 38 states, representing a wide spectrum of backgrounds. Twenty-three refuge Friends groups attended, along with numerous state agencies and dozens of nonprofit conservation organizations. Fish and Wildlife Service attendees included biologists, refuge managers, interpretive specialists, heavy-equipment operators, and regional directors. Learn more at https://commons.wikimedia.org/wiki/File:National_Wildlife_Refuge_System_Conservation_In_Action_Summit_-_Summary.pdf</p>
2004	<p>Refuge Update print version initiated: "Refuge Update", a bi-monthly printed newsletter about activities underway in the Refuge System is launched by the Refuge System National Headquarters. Articles look at the people and programs that make the Refuge System a valued conservation program. The publication continued through mid-2016 at which time it was discontinued. A digital collection of all editions is at https://commons.wikimedia.org/wiki/File:00_Refuge_Update_Article_Index.pdf. Informal email refuge updates were issued from the national headquarters for a number of years before this "print" version was put in place.</p>
2004	<p>Increased focus on constructed real property: Executive Order 13327 Federal Real Property Asset Management is issued The President. It focused on improved management of constructed facility assets (buildings, roads, bridges, water management structures, etc.) across the federal government. The Interior Department placed major emphasis on implementing this E.O. over the next decade. Greatly increased attention was given to management of constructed real property in the Refuge System and facility maintenance was a priority for Refuge System budget requests.</p>
2004	<p>Biological integrity, diversity and environmental health symposium: The Natural Resources Journal devoted its fall 2004 issue to the symposium on managing biological integrity, diversity and environmental health in the National Wildlife Refuge System available at Natural Resources Journal Archive Home Page Vol 44 Iss 4. The symposium explored a key provision in the 1997 Refuge Improvement Act which directs that the biological integrity, diversity and environmental health of refuges be maintained. This directive is unique and proper for the Refuge System but it is a tall order given the perturbations that refuge system lands and waters are subject to. The debate and study on how best to implement this worthy goal is an ongoing factor that challenges refuge managers and their partners.</p>

2005	“Last Child in the Woods” published: "Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder" by Richard Louv published. The author links the absence of nature in the lives of today's wired generation to some of the most disturbing childhood trends: the rise in obesity, attention disorders, and depression. This book brings together a body of research indicating that direct exposure to nature is essential for healthy childhood development and for the physical and emotional health of children and adults. Learn more at Books The book has a wide following and national wildlife refuges provide an obvious antidote to “Nature-Deficit Disorder”.
2005	“Passion and Politics in Arctic NWR” published: “Where Mountains Are Nameless: Passion and Politics in the Arctic National Wildlife Refuge” by Jonathan Waterman is published. It traces the struggle between conservationists and oil developers in the Arctic National Wildlife Refuge, discussing the historical and scientific elements that have contributed to the conflict, conservation efforts of Olaus and Mardy Murie, and the author's own journeys within the region's natural environment.
2006	Haskett named 22nd Refuge System Chief: Geoff Haskett was the 22nd Chief of the Refuge System. He was born in San Mateo, California in 1954. His University training includes an MS in Public Administration from Portland State University He started his FWS career in 1979 with the Realty office in the Portland Region. He then joined the Bureau of Land Management's realty program in Burns, OR followed by a stint as Deputy for the Alaska lands program for the National Park Service. He then rejoined the FWS as Chief, Branch of Operations, and subsequently as Chief of the Division of Realty in the Washington Office. He then served as Regional Chief of Refuges for the Southeast Region in Atlanta and the Deputy Regional Director for the Southwest Region in Albuquerque before being named Chief of the Refuge System. Management priorities during his tenure included continued progress on implementing the Refuge System Improvement Act with emphasis on improved science, and applying increased attention to marine and coastal resources protected by the Refuge System. The FWS Director during his tenure was Dale Hall. Following his tenure as Chief of Refuges, he was Regional Director for Alaska until his retirement in 2016. He is currently President of the National Wildlife Refuge Association.
2006	“Endangered Species at 30” published: The book "The Endangered Species Act at Thirty, Volume 1: Renewing the Conservation Promise" is published with a chapter devoted to the positive role that the National Wildlife Refuge System plays in conserving and recovering endangered species " The National Wildlife Refuge System " by Robert P. Davison, Alessandra Falcucci et al.
2006	“Last Great Wilderness” published: “Last Great Wilderness: The Campaign to Establish the Arctic National Wildlife Refuge” by Roger Kaye is published. It describes the history and philosophy of visionaries who strived to conserve this unique wilderness area for the benefit of future generations. Kaye also published an earlier article in 1999 “The Arctic National Wildlife Refuge: An Exploration of the Meanings Embodied in the Last Great Wilderness” that can be viewed here https://www.environmentandsociety.org/sites/default/files/key_docs/rcc_00097009_4_1.pdf beginning at page 92.
2006	“New Directions for the Refuge System” is published: The article "New Directions in Conservation for the National Wildlife Refuge System" is published in Bioscience New Directions in Conservation for the National Wildlife Refuge System . It discusses management challenges and opportunities for the Refuge System as it implements the Refuge System Improvement Act of 1997.
2006	Converting Defense lands to conservation purposes: A total of about 1.2 million acres of the Refuge System came from lands formerly managed by the Department of Defense. These lands ranging from relatively undisturbed to heavily impacted by toxic chemicals and other environmental degradations have come to the Refuge System with associated management challenges but have demonstrated the Refuge Systems value as a restorer of nature and its associated public enjoyment. A PhD Dissertation by David G. Havlick examines the history and implications of conversion of military lands to wildlife conservation uses. Learn more at Bombs Away: New Geographies of Military-to-Wildlife Conversions in the United States
2006	First Marine National Monument established: President George W. Bush issued Presidential Proclamation 8031 (The President) establishing Papahānaumokuākea Marine National Monument. It is the single largest conservation area under the U.S. flag, and is one of the largest marine conservation areas in the world. This Marine National Monument was expressly created to protect an exceptional array

	of extensive coral reefs, small islands and shallow water environments sheltering over 7,000 marine species and cultural sites significant to Native Hawaiians
2006	“Refuge Managers Memoir” published: “Dream Hunter – A National Wildlife Refuge Manager’s Memoir” by Edward S. Crozier is published https://openprairie.sdstate.edu/alumni_pubs/5/?fbclid=IwAR3AcvtlLRGrZnpCUYaW30_NkjWmut_7FiY8VyoQCMIEKNcQ83-IXmLARmo . It gives a series of recollections from the author's nearly 50 years of working with the Refuge System. They include adventures and experiences as a professional manager of several national wildlife refuges - stories about growing up in a small town on the Minnesota prairie, working as Forest Service fire-tower lookout, a Park Service firefighter, a wilderness guide and as a wildlife manager (emphasis on Upper Mississippi NFWR and Minnesota Valley NWR).
2007	Refuge System strategic plan completed: The "Final Strategic Plan for the National Wildlife Refuge System FY 2006-2010" was completed. It identified priorities for the Refuge System under 12 goals, along with associated performance measures. Most of the priorities had their origin in the 1998 Fulfilling the Promise effort and the 2004 Conservation in Action Summit. Learn more at https://commons.wikimedia.org/wiki/File:Strategic_Plan_for_the_National_Wildlife_Refuge_System.pdf
2007	House oversight hearing on Refuge Improvement Act: The House Natural Resources Committee held an oversight hearing “Implementation of the National Wildlife Refuge Improvement Act: Has the Promise Been Fulfilled?” Testimony was provided by a number of presenters https://www.govinfo.gov/content/pkg/CHRG-110hhrg38316/pdf/CHRG-110hhrg38316.pdf who generally concurred that the Improvement Act has been an effective and appropriate guide to manage the NWRS. FWS Director Dale Hall’s testimony (starts on page 37) gives a good history of the Refuge System.
2008	“Bear Wrangler” published: "Bear Wrangler: Memoirs of a Pioneer Biologist" by Will Troyer is published. The book gives Troyer's memoirs of his 30-year career with the FWS in Alaska (1951-1981) including manager of Kodiak NWR and Kenai NWR. Troyer’s engaging prose affirms his passionate connection to the natural world, as he describes experiences such as being in the midst of a herd of 40,000 caribou. Bear Wrangler is an absorbing tale of one man’s experience as an authentic pioneer in the last vestiges of American wilderness. Troyer is also the author of "Into Brown Bear Country" and "From Dawn to Dusk: Memoirs of an Amish-Mennonite Farm Boy", and has written in numerous magazines, including Natural History, Alaska Magazine, and Outdoor Life.
2008	Malheur Centennial publication: "Malheur's Legacy: Celebrating a Century of Conservation 1908-2008" by Carla Burnside is published by the FWS. See the book at https://www.google.com/books/edition/Malheur_s_legacy/gJh8LDL67k8C?hl=en&gbpv=1
2008	Refuge System video: The FWS produced a 12-minute video entitled "National Wildlife Refuge System: A Place for Wildlife" that highlights wildlife and history of the Refuge System National Wildlife Refuge System: A Place for Wildlife
2008	“Keeping Every Cog and Wheel” published: “Keeping Every Cog and Wheel: Reforming and Improving the National Wildlife Refuge System” is jointly published by the Aldo Leopold Foundation, American Bird Conservancy, Defenders of Wildlife, National Audubon Society, National Wildlife Federation, National Wildlife Refuge Association, Trust for Public Land, and The Wilderness Society. The report, the product of more than a year’s research, discussion and deliberation, offers an objective assessment of the state of the Refuge System and makes recommendations to reform, strengthen and guide the refuge system well into its second century. Many of the recommendations remain valid today. Learn more at https://defenders.org/sites/default/files/publications/keeping_every_cog_and_wheel.pdf
2008	Friends: There were more than 200 nonprofit Refuge Friends organizations with more than 50,000 members nationwide working on behalf of the Refuge System. Most are connected to a single refuge. Friends of Alaska National Wildlife Refuges support all 16 refuges in Alaska. Friends of Midway Atoll National Wildlife Refuge has at least one member from every state in the country. Friends organizations are independent entities but they partner with others in order to be more effective. In addition to partnering with their local refuge, Friends organizations have resources available to them from the Refuge System national headquarters https://www.fws.gov/refuges/friends/ , from the National Wildlife

	<p>Refuge Association https://www.refugeassociation.org/friends, and the more recently formed Coalition of Refuge Friends and Advocates https://coalitionofrefugefriends.com/</p>
2008	<p>Independent Assessment of Refuge System Effectiveness: A detailed independent analysis of the effectiveness of the Refuge System in meeting its mission https://commons.wikimedia.org/wiki/File:Independent_Evaluation_on_Effectiveness_of_the_National Wildlife Refuge System_Summary_Overview.pdf https://commons.wikimedia.org/wiki/File:Independent_Evaluation_on_Effectiveness_of_the_National Wildlife Refuge System.pdf was concluded in 2008. Project managers analyzed the effectiveness of accomplishing the 12 strategic goals from the 2007 Strategic Plan and concluded that the Refuge System was highly effective in meeting 1 goal, effective in meeting 4 goals, partially effective in meeting 4 goals, ineffective in meeting 2 goals, and that effectiveness for 1 goal could not be determined. The 221-page final report provided the rationale for these findings. The report indicated that the biggest challenges in meeting goals were inadequate budgets and staffing and heavy burdens of administrative reporting requirements.</p>
2009	<p>Siekaniec named 23rd Refuge System Chief: Gregory (Greg) Siekaniec was born in Sioux City, IA in 1956, and moved with his family to Moorhead MN at an early age. He is a 1985 graduate of the University of Montana in wildlife biology. A 24-year veteran of the Refuge System before being appointed as Refuge System Chief, he started his FWS career as a clerk typist in 1986 at J. Clark Salyer NWR, ND before beginning his management career at Charles M. Russell NWR in MT. He continued with management stints in ND and WY before heading to Izembek NWR in AK. He then served 8 years as manager of Alaska Maritime NWR which encompasses more than 2,500 islands and nearly five million acres. Among achievements at Alaska Maritime, he is credited with developing many partnerships with national conservation organizations to restore island biodiversity. He then was Chief of the Refuge System from 2009-2011. During this time, he led efforts to establish a plan for the Refuge System to meet the challenges of the 21st century (Conserving the Future). He also oversaw implementation of the American Recovery and Reinvestment Act that provided \$210 million for infrastructure repairs, improvements and construction in the Refuge System. The FWS Director during his tenure as Refuge System Chief was Dale Hall. Following his time as Chief of Refuges, he became FWS Deputy Director (2011-2012) before joining Ducks Unlimited Canada as their Chief Executive Officer (2012-2016). He returned to the FWS as Regional Director for Alaska in 2016 until his retirement in 2021. See more about his career with emphasis on his time in Alaska at https://alaskausfws.medium.com/my-life-wildlife-greg-siekaniec-2b67e4788bac.</p>
2009	<p>Recovery Act enacted: The American Recovery and Reinvestment Act of 2009 was a stimulus package enacted by the 111th U.S. Congress and signed into law by President Obama. Developed in response to the Great Recession of 2008, the primary objective of this law was to save existing jobs and create new ones as soon as possible (the term “shovel-ready projects was widely used). It provided a total of \$290 million for the FWS. The FWS designated \$210 million of that amount to the Refuge System for repair or improvements to refuge facilities.</p>
2009	<p>Pacific Remote Island Marine National Monument established: President George W. Bush issued Presidential Proclamation 8336 establishing the Pacific Remote Islands Marine National Monument southwest of Hawaii. The monument incorporates approximately 55.6 million acres within its boundaries, which extend 50 nautical miles from the mean low water lines of Howland, Baker, and Jarvis Islands; Johnston, Wake, and Palmyra Atolls; and Kingman Reef. Learn more at https://www.federalregister.gov/documents/2009/01/12/E9-500/establishment-of-the-pacific-remote-islands-marine-national-monument</p>
2009	<p>Rose Atoll Marine National Monument established: President George W. Bush issued Presidential Proclamation 8337 which established Rose Atoll Marine National Monument. The monument surrounds previously existing Rose Atoll NWR and incorporates approximately 8.6 million acres within its boundaries, which extend 50 nautical miles from the mean low water line of Rose Atoll. It is the southernmost point of the U.S. and sustains many endemic corals, fish, shellfish, marine mammals, seabirds, water birds, land birds, insects, and vegetation not found elsewhere. Learn more at Establishment of the Rose Atoll Marine National Monument</p>

2009	<p>Mariana Trench Marine National Monument established: President George W Bush issued Presidential Proclamation 8335 establishing the Mariana Trench Marine National Monument. The monument incorporates approximately 60.9 million acres within three units in the Mariana Archipelago. The Mariana Trench Unit is almost 1,100 miles long and 44 miles wide and includes only the submerged lands. The Volcanic Unit consists of small circles (2.3 miles in diameter) around 21 undersea mud volcanoes and thermal vents along the Mariana Arc, again only the submerged lands. The Islands Unit includes only the waters and submerged lands of the three northernmost Mariana Islands, Farallon de Pajaros or Uracas, Maug, and Asuncion, below the mean low water line. Learn more at 2009 Compilation— Presidential Documents</p>
2010	<p>Refuge System stats: As of September 30, 2010, the Refuge System had 552 refuges (145.2 million acres) and waterfowl production areas in 206 counties (3.5 million acres). Recreation visits during FY 2010 were 365 million. The FY 2010 operations and maintenance budget was \$503.3 million; the workforce included an estimated 3,048 full time equivalents. 41,600 individuals contributed over 1.5 million hours of volunteer time to the Refuge System.</p>
2010	<p>Deepwater Horizon oil spill: The Deepwater Horizon oil spill, considered to be the largest marine oil spill in the history of the petroleum industry, occurred in the Gulf of Mexico about 40 miles off the coast of Louisiana. A deep water well leaked oil from April to September and over 200 million gallons of crude oil leaked. A massive cleanup effort was undertaken and coastal areas were impacted from Louisiana to Florida. For one look at lessons learned 10 years after the incident see the following report from NOAA https://www.fisheries.noaa.gov/feature-story/restoring-gulf-10-years-after-deepwater-horizon-oil-spill</p>
2010	<p>Arctic NWR 50th anniversary: The National Conservation Training Center and the Arctic National Wildlife Refuge convened the Arctic National Wildlife Refuge 50th Anniversary Symposium in Shepherdstown, WV. The Arctic NWR is one of the Refuge System’s greatest stories. The symposium shared that history by gathering many of the living principal players and wilderness aficionados who see Arctic Refuge as a crown jewel of the American wilderness system. The 150 or so participants were a “who’s who” of the conservation and wilderness fields. The 132-page proceedings are available at https://commons.wikimedia.org/wiki/File:Arctic_National_Wildlife_Refuge_50th_Anniversary.pdf. The anniversary was also noted by President Barak Obama in a Presidential Proclamation https://www.govinfo.gov/content/pkg/FR-2010-12-09/pdf/2010-31127.pdf</p>
2010	<p>Papahānaumokuākea designated a World Heritage Site: Papahānaumokuākea Marine National Monument is designated a World Heritage Site Papahānaumokuākea by the United Nations Educational, Scientific and Cultural Organization, which seeks to encourage the identification, protection and preservation of cultural and natural heritage sites around the world that are of outstanding value to humanity. This is embodied in an international treaty called the Convention Concerning the Protection of the World Cultural and Natural Heritage (1972). There are 1,121 designated World Heritage sites and 24 in the U.S. Papahānaumokuākea is the single World Heritage site in the Refuge System. It is the largest contiguous fully protected conservation area under the U.S. flag, and one of the largest marine conservation areas in the world. Learn more at (PDF) Sailing through Time: A Historical Examination of the Explorations and Expeditions of the Papahānaumokuākea Marine National Monument.</p>
2010	<p>“Arctic Sanctuary” published: “Arctic Sanctuary: Images of the Arctic National Wildlife Refuge” by Laurie Hoyle and Jeff Jones is published. Guided by photographer Jeff Jones’s well-developed vision, Arctic Sanctuary leads the reader on a remarkable journey that few of us will ever take in real life: a trek deep into Alaska’s Arctic NWR. By turns celebratory and contemplative, emotionally evocative and beautifully fierce, this collection of lyrical essays and stunning panoramic photographs pays homage to a vast and remote land that remains untamed by technology and undisturbed by human development. A rare window into a world that is whole, ecologically intact, and still driven by ancient evolutionary energies, Arctic Sanctuary invites us to examine our own ideas of the wilderness ethic in the modern world.</p>
2010	<p>Systematic science strengthened: The Refuge System establishes the Natural Resource Program Center (NRPC) in Ft. Collins, CO to help support the scientific management of the Refuge System. The NRPC increases the Refuge System’s ability to conserve wildlife and habitat by: 1) working to improve air and water quality in and around refuges, 2) addressing wildlife health and disease issues,</p>

	<p>3) setting rigorous standards for conducting surveys on refuges, 4) thoughtfully designing and implementing data management tools, and 4) supporting conservation through the lens of social science. Learn more at https://www.fws.gov/program/natural-resource-center</p>
2011	<p>Kurth named 24th Refuge System Chief: James W. (Jim) Kurth had the distinction of being Chief twice. He was the 19th Chief from 1999-2001 as Chief of the Division of Refuges (see information for that tenure at 1999) and the 24th Chief as Assistant Director for the Refuge System from 2011-2015. In the intervening decade he served as Deputy Chief to 4 different Refuge System Chiefs each of which held the position of Assistant Director for the Refuge System. Priority activities during this tenure as Refuge System Chief focused on developing and implementing actions identified in the 2010 Conserving the Future vision. FWS Directors during this tenure were Sam Hamilton and Dan Ashe. Following his second stint as Chief of Refuges, Kurth was named FWS Deputy Director where he served until his retirement in 2019. Cumulatively, he served 20 years in national leadership positions and contributed much to the advancement of the Refuge System.</p>
2011	<p>Conserving the Future vision published: The FWS publishes “Conserving the Future: Wildlife Refuges and The Next Generation” https://books.google.com/books?id=p06NCjhUAXEC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false It describes results of a strategic engagement process to envision how best to implement the Refuge System Mission. The National Wildlife Refuge Association played a prominent role in this visioning process, encouraging development of bold ideas to carry the Refuge System into the future. A total of 24 recommendations for action are described. Implementation teams were put in place to develop specific follow-up actions. An overview of the effort is provided in the fall 2011 issue of "Fish and Wildlife News" https://commons.wikimedia.org/wiki/File:Fish_and_Wildlife_News,_U.S._Fish_and_Wildlife_Service_special_edition.pdf . Among these actions is expanding contact with urban communities as over 100 refuges are within 25 miles of an urban area with a population over 250,000.</p>
2011	<p>“Bayou-Diversity” published: “Bayou-Diversity: Nature and People in the Louisiana Bayou Country” by former Refuge Manager Kelby Ouchley is published. Through essays about Louisiana’s natural history, Bayou Diversity details an amazing array of plants and animals in the Bayou State. Bald cypress, orchids, feral hogs, eels, black bears, bald eagles and cottonmouth snakes live in the bayous of the region. Collectively, these vignettes portray vibrant and complex habitats along with human interaction with the bayou. Our role in its survival, Ouchley argues, will determine the future of these intricate ecosystems. The sequel "Biodiversity 2" was published in 2018. In 2022 he published “Bayou D’Arbonne Swamp: A Naturalist’s Memoir of Place” that reflects on nature in and near D’Arbonne National Wildlife Refuge. He also maintains a blog at https://www.facebook.com/search/top?q=bayou-diversity</p>
2012	<p>"Bob Hines: National Wildlife Artist" published: This book by John D. Juriga describes Hines’s remarkable talent and career in this biography. Hines, a gifted self-taught artist, found his calling during the Great Depression, turning to art as a way to share the richness in nature’s beauty. His career brought him from designing the 1946 Federal Duck Stamp to joining the Fish and Wildlife Service (1948) where he managed the Duck Stamp competition for over 30 years, earning him the nickname of "Mr. Duck Stamp Contest." His collaboration with Rachel Carson and other luminaries placed him on the cusp of the environmental movement in the U.S. Among his many popular artworks "Ducks at a Distance" (1963) and "Fifty Birds of Town and City" (1975) (see entries at 1963 and 1975)</p>
2012	<p>Iconoclast In Ink Ding Darling published: “Iconoclast in Ink: The Political Cartoons of Jay N. “Ding” Darling” by Richard S. West is published. The editorial cartoons of Jay N. “Ding” Darling illustrated what he believed were the important topics of society and politics whether or not they were considered newsworthy by others. The 150 political cartoons selected for Iconoclast in Ink chronicle the personalities and events of the first half of the twentieth century. Pulitzer Prize–winner Darling was an ardent proponent of conservation, known for speaking, writing, and drawing cartoons about the issue. Darling was Director of the Biological Survey (precursor of FWS), worked with J. Clark Salyer to establish many national wildlife refuges, and designed the first Duck Stamp. He also founded the National Wildlife Federation.</p>

2013	<p>Refuge videos on Wilderness and Endangered Species: The FWS produces 2 videos “50 Years of Wilderness in the National Wildlife Refuge System” 50 Years of Wilderness in the National Wildlife Refuge System and “40 Years of Endangered Species in the National Wildlife Refuge System” 40 Years of Endangered Species in the National Wildlife Refuge System.</p>
2013	<p>FWS urban wildlife program formalized: The 2011 “Conserving the Future” visioning process for the Refuge System identified increased attention to urban refuges as a priority need since over 100 national wildlife refuges are located within 25 miles of an urban area with a population of at least 250,000 people. A “Conserving the Future” implementation team developed standards of excellence for urban refuges and charted a course for working with community partners in urban areas. In 2013, the FWS issued Director’s Order 208 – “Urban Wildlife Refuge Designation and Partnerships” and subsequent policy (110 FW 1), with the goal of prioritizing conservation and recreational access in urban areas where more than 80 percent of Americans live. The program includes all FWS organizational entities and works to improve the lives of our nation’s citizens by expanding access to green space, education and outdoor recreation for Americans living in and around cities. Program members work to clear social and historical barriers and foster new connections that advance conservation and strengthen communities. See additional information in the 1972 entry in this document on the early development of urban wildlife refuges.</p>
2014	<p>Marine National Monuments in the Pacific expanded: The Pacific Remote Islands and Papahānaumokuākea Marine National Monuments were expanded by President Obama in September 2014 by Proclamation 9173 Presidential Documents and in August 2016 by Proclamation 9478 Presidential Documents, respectively. This brought the total area of Marine National Monuments in the Pacific to nearly 760 million acres, which by comparison is about 40% of the area of the lower 48 states. Additional information on the Marine National Monuments in the Refuge System is available at Living Monuments and https://www.fws.gov/story/hope-spots-ocean.</p>
2014	<p>“Lessons from Detroit River International Wildlife Refuge published: “Bringing Conservation to Cities: Lessons from Building the Detroit River International Wildlife Refuge” by Detroit River IWR manager John Hartig is published. It describes what it takes to foster a conservation ethic in a major urban area—complete with critical lessons learned—and to simultaneously inspire and develop the next generation of urban conservationists. The book explores the new urban conservation frontier, with its numerous challenges and opportunities, and fosters more urban conservation initiatives throughout the world. A review of the book is available at History, the Detroit River and Building an International Wildlife Refuge Right – The Nature of Cities.</p>
2014	<p>“My Heart Goes Where the Blue Goose Goes” published: In this book, former Refuge Manager Joe White shares experiences from his career. Many enlightened citizens see our public lands as national treasures worthy of our love and respect. The public lands closest to the author's heart is the Refuge System which is dedicated to the well-being of those furry, feathered, and scaly creatures with which we share planet earth. It was the author's great pleasure to serve on 7 national wildlife refuges over the course of a 35-year career, a career that produced events and adventures the average citizen would find difficult to believe. This book is the sequel to “The Blue Goose and Me” and continues the events and adventures on his last three refuges, Delta NWR at the mouth of the Mississippi River, Gulf Islands NWR 40 miles off the coast of Louisiana and Mississippi, and St. Marks NWR in the Big Bend of Florida.</p>
2014	<p>“Forty Seasons in the Arctic NWR” published: “Sunlight North: The Wisdom of the Arctic Wilderness: Forty Seasons in the Arctic National Wildlife Refuge” by Clarence A. Crawford is published. The author writes about his experiences in the Refuge, recalling the many ways it has shaped his life during the past forty years. The bulk of these chapters narrate some aspect of travel in the Arctic. Other chapters deal with contemporary attitudes that may adversely affect the Refuge and other wilderness areas. Several chapters deal with the mythical and philosophical underpinnings of why people quest, in wilderness and elsewhere. An updated edition published in 2019 describes 45 seasons.</p>
2015	<p>Martinez named 25th Refuge System Chief: Cynthia Martinez, the current Chief of the Refuge System, is a fifth generation New Mexican. She is the first woman and the first Hispanic to lead the Refuge System. Martinez holds a bachelor's degree in biology from New Mexico State University and a master's degree in fisheries and wildlife management from the University of Arizona. She began her FWS</p>

	<p>career in 1993 with Ecological Services Field Offices in Arizona and New Mexico. She then shifted to the Refuge System as project leader at Desert National Wildlife Refuge Complex. In 2010 she was selected as Chief of the Division of Visitor Services in the National Headquarters. In 2011, Martinez took the challenge to lead development of a conference and subsequent guiding documents that charted a renewed vision built on the foundation of “<i>Fulfilling the Promise</i>” for the growth and management of the Refuge System. She has championed this updated vision entitled “<i>Conserving the Future: Wildlife Refuges and the Next Generation</i>” during her tenure as Chief by implementing many of its components. This includes transforming and modernizing Refuge Law Enforcement and an internal rebranding effort to ensure that all Americans recognize that wildlife refuges are necessary for both humans and wildlife to thrive. Also, through the creation and expansion of the Urban Wildlife Conservation Program, she has helped take wildlife conservation to the places where most Americans live – cities and suburbs. The Urban program engages people and communities traditionally excluded from wildlife conservation to provide opportunities to experience nature and strengthen local conservation outcomes. During her tenure, the Refuge System expanded exponentially in size in 2016 when President Barack Obama signed a Proclamation expanding Marine National Monuments in the Pacific, including Papahānaumokuākea Marine National Monument - the largest contiguous fully protected conservation area under the U.S. flag and one of the largest marine conservation areas in the world. The Refuge System now encompasses over 855 million acres of lands and waters. FWS Directors during her tenure have included Dan Ashe, Aurelia Skipworth, and Martha Williams.</p>
2015	<p>"Global change and conservation triage on NWRs" published: This article in the journal <i>Ecology and Society</i> [20(4):14] describes how National Wildlife Refuges play an important role in helping social-ecological systems adapt to global change processes such as climate change, sea level rise, and changing land use. Learn more at Global change and conservation triage on National Wildlife Refuges</p>
2015	<p>"National Wildlife Refuges: A Half Century of Kent Olson Cartoons" published: Kent Olson, a long-time FWS employee working mostly in the Twin Cities Regional Office produced a variety of beloved drawings. This book displays some of the best https://books.google.com/books?id=oK60GHxYVkgC&printsec=frontcover&dq=inauthor:%22Kent+Olson%22&hl=en&newbks=1&newbks_redir=0&sa=X&ved=2ahUKewjp_ITAI6LoAhVnl3IEHR8ACTYQ6AEwA_HoECAAQAg#v=onepage&q&f=false Olson was a field biologist from 1958 to 1990 working for the Refuge System. Many of Olson's original artworks are housed at the FWS Museum/Archives at the National Conservation Training Center in Shepherdstown, WV. Two other works by Olson at https://babel.hathitrust.org/cgi/pt?id=umn.31951p01007378n&view=1up&seq=9 and https://babel.hathitrust.org/cgi/pt?id=uc1.31210024952903&view=1up&seq=2&skin=2021</p>
2015	<p>"Wilderness Warrior" published: “Wilderness Warrior: Theodore Roosevelt and the Crusade for America” by Douglas Brinkley and Dennis Holland is published. It describes the legacy of Theodore Roosevelt and the conservation of America’s public lands.</p>
2016	<p>Beginners Guide to the NWRs: The FWS produced a 2 minute 30 second video entitled "A Beginner's Guide to the National Wildlife Refuge System" that provides a brief introduction to the Refuge System. See video at A Beginner's Guide to the National Wildlife Refuge System and narrative at https://www.fws.gov/refuges/features/A-Beginners-Guide-to-the-National-Wildlife-Refuge-System.html</p>
2016	<p>Atlantic Ocean Marine National Monument established: President Barack Obama established the Northeast Canyons and Seamounts Marine National Monument by Presidential Proclamation 9496 Presidential Proclamation -- Northeast Canyons and Seamounts Marine National Monument. Located about 130 miles off the coast of Cape Cod, Massachusetts; it is approximately the size of Connecticut (3.1 million acres) and is the only marine national monument in the Atlantic Ocean. The monument is renowned for its rich and unique biodiversity, including deep-sea coral communities and concentrations of marine wildlife. Its geographic features create oceanographic conditions that concentrate ocean-dwelling animals including whales, dolphins, and turtles, as well as fishes that migrate long distances. A large number of seabirds also rely on this area for foraging.</p>
2016	<p>Malheur NWR Headquarters occupation: January 2 thru February 11, 2016, an armed group of far-right extremists seized and occupied the headquarters of the Malheur NWR in Oregon. Organizers were seeking an opportunity to advance their mistaken view that the federal government lacks authority</p>

	to own and manage public lands. Militants believed they could do this by protesting. (see the related item at 2018 “Sagebrush Collaboration”)
2017	“Banking on Nature” update published: The latest "Banking on Nature" report, indicated that FY 2017 spending by recreational visits to wildlife refuges generated \$3.2 billion of economic output in local economies. As this spending flowed through the economy, it supported over 41,000 jobs and generated about \$1.1 billion in employment income. Recreational spending at wildlife refuges generated about \$229 million in tax revenue at the local, county, and State levels. Learn more at BANKING ON NATURE 2017
2017	“Fish and wildlife management on federal lands: debunking state supremacy” published: This article (available through JSTOR) in the Journal of Environmental Law provides a detailed legal analysis and history of state and federal authority to manage wildlife on federal lands. The authors conclude: 1) that federal land management agencies have an obligation; not just the discretion to manage and conserve wildlife on federal lands and 2) that the state’s role is subservient to the federal role. The Refuge System recognizes the complementary roles of the state and federal government in managing wildlife. They strive to work cooperatively with state fish and wildlife agencies as these partnerships are most often mutually beneficial to both parties. Exceptions do occur at times, however when there are disagreements over policy or practices. In these cases, the Refuge System works in good faith to resolve differences but exerts its federal authority when needed.
2017	Meet the National Wildlife Refuge System published: This general overview of the Refuge System was developed by the Fish and Wildlife Service as part of the Conserving the Future implementation. It was first published in 2015 as “Meet the National Wildlife Refuge System, Special Places for Wildlife and People” https://digitalmedia.fws.gov/digital/collection/document/id/2108 and then amended and published in 2017 as “Meet the National Wildlife Refuge System, for Wildlife and People” https://commons.wikimedia.org/wiki/File:Meet_the_National_Wildlife_Refuge_System.pdf .
2018	“Sagebrush Collaboration” published: “Sagebrush Collaboration: How Harney County Defeated the Takeover of the Malheur Wildlife Refuge” by Peter Walker published. Every American is co-owner of the most magnificent estate in the world—federal forests, grazing lands, monuments, national parks, wildlife refuges, and other public places. The writer Wallace Stegner famously referred to public lands as “America’s best idea,” but there have always been some who oppose the idea for ideological reasons, or because they have a vested economic interest. In the current decade, federal public lands have been under physical threat as never before, with armed standoffs and takeovers that the US government has proved stunningly challenging to prosecute in federal courts. One such incident was the takeover of the Malheur NWR in Oregon in 2016. Armed militants seized the headquarters of the refuge for forty-one days and occupied the community for three months. Militants threatened and harassed local residents, pledging to “give back” the land to unnamed “rightful owners” in their effort to enact a fringe interpretation of the U.S. Constitution. Drawing on more than two years of intensive fieldwork, Sagebrush Collaboration shows that the militants failed in their objectives because the sensible and hardworking citizens of Harney County had invested decades in collaboratively solving the very problems that the militia used to justify their anti-federal-government uprising.
2018	“Sanibel and Captiva Islands: The Conservation Story” published: This book by Betty Anholt and Charles LeBuff describes the natural history of the area and the conservation mindedness of various individuals and organizations in the conservation of these two coastal barrier islands in southwest Florida. It asks the question of what led to conservation efforts here when other similar areas underwent total development.
2018	Volunteer legislation amended: The Keep America’s Refuges Operational Act (P.L. 115-168) amends the Fish and Wildlife Act of 1956 to reauthorize through FY 2022: a) the volunteer services, community partnership and education programs of the Refuge System; and b) provisions related to acceptance of gifts, devices, or bequests of real and personal property. https://www.congress.gov/bill/115th-congress/house-bill/3979?q=%7B%22search%22%3A%5B%22keep+refuges+operational%22%5D%7D&s=7&r=3 For information on the current volunteer program see https://www.fws.gov/volunteers/

2019	<p>John Dingell, Jr. Conservation Management and Recreation Act enacted: Among other provisions, this law permanently reauthorizes the Land and Water Conservation Fund which provides funding to acquire new refuge lands. It was named in honor of Congressman John Dingell of Michigan who was the longest serving member of the House (59 years) and was active in many key legislative measures for conservation. He also served on the Migratory Bird Conservation Commission for 45 years (1969-2014) overseeing land purchases for the Refuge System. He also authored the 2001 legislation establishing Detroit River International Wildlife Refuge and was a champion of the Refuge. Learn more at https://www.thenatureofcities.com/2019/05/02/tribute-u-s-congressman-john-dingell-conservation-hero/</p>
2019	<p>"Wheeler National Wildlife Refuge (Images of America)" published: This book by Thomas V. Ress tells the story of Wheeler NWR in Alabama and how the character of the land within the refuge boundaries changed. From eroded, barren fields in 1938 when the refuge was established arose thick stands of hardwoods and pines, lush wetlands, and shady sloughs. Today, the refuge is a haven of natural beauty surrounded by the trappings of modern society, attracting thousands of visitors who come to view the large numbers of ducks, geese, cranes, and other wildlife that inhabit the refuge.</p>
2019	<p>"The Audubon Warden" published: This book by Charles Lebuff tells how in the early 1930s hard-working people were sometimes forced to live off the land. Some, like maladjusted Pug Wilson, were extremely dangerous. Wilson threatens Jake Barnes, a successful tarpon fishing guide who changes his career path when he accepts a position as an Audubon warden. As a sworn lawman he is charged to protect birds and other wildlife. Despite serious threats on his life, Jake is determined to carry on his important work. In "The Audubon Warden" Jake Barnes deals with interactions with callous outlaws during the time of the Great Depression. This is a fictional novel but envisions what life may have been like for an Audubon Warden.</p>
2020	<p>Coalition of Refuge Friends and Advocates formally established: This group was active informally since 2013 but in 2020 became a formally established 501(c)3 nonprofit organization through approval of official articles of incorporation and by-laws. The organization fosters a network of nonprofit "Friends" organizations supporting the National Wildlife Refuge System and the National Fish Hatchery System. Working in partnership with the National Wildlife Refuge Association, they work to ensure all Friends have the knowledge, tools, skills, and support to be effective nonprofits working to conserve wildlife, their habitat, and associated cultural and historical resources. Learn more at https://coalitionofrefugefriends.com/</p>
2020	<p>Great American Outdoors Act enacted: This law gave a big boost to the Refuge System maintenance and land acquisition programs. The law provides \$1.9 billion each year for the next five (FY 21-25) to reduce the maintenance backlog of our nation's public lands. The Refuge System will receive 5% of this funding each year, or \$95 million, to repair facilities such as visitor centers, boardwalks and trails, and water management structures. The law also provides full, dedicated funding of the Land and Water Conservation Fund (LWCF). Originally enacted in 1965, LWCF has been the main driver of the acquisition of public lands in this country. Although Congress intended LWCF to be funded at \$900 million per year, that level was only reached twice in its history. The Great American Outdoors Act authorizes LWCF at \$900 million each year in perpetuity. The Refuge System is expected to roughly double its land acquisition budget with the enactment of this law.</p>
2020	<p>"Finding Refuge" published: "Finding Refuge: Imperiled Species and the National Wildlife Refuge System" is jointly published by the Defenders of Wildlife and the National Wildlife Refuge Association. It highlights the role of the Refuge System in conserving and restoring threatened and endangered species. A review of available documents indicated that 513 endangered and threatened species—nearly one-third of the total listed under the ESA—are found on, or are dependent upon, at least 444 refuges. Learn more at Finding Refuge: Imperiled Species and the National Wildlife Refuge System</p>
2020	<p>History of the Cooperative Alliance for Refuge Enhancement published: The Cooperative Alliance for Refuge Enhancement (CARE) was formed as a national coalition of 15 major private conservation organizations in 1995. The number of organizations has since grown to 23. The organizations are bound together by a common understanding that a long history of underfunding was the</p>

	major challenge for the Refuge System. They share one common goal: to ensure robust funding to maintain a strong National Wildlife Refuge System. The history of this unique partnership was published in 2020, marking the group's 25th anniversary and is available at https://static1.squarespace.com/static/5c2a3500f793923866cf19b8/t/633331cf048619320902ce366/1664294144790/A+History+of+CARE.pdf . Also, CARE launched a new Web Site in 2023 at About CARE — Cooperative Alliance for Refuge Enhancement (fundwildliferefuges.com)
2020	Federal land ownership overview published: The Congressional Research Service publishes “Federal Land Ownership: Overview and Data” Federal Land Ownership: Overview and Data . It gives a brief overview of the history and status of federal land holdings along with data by state as of September 30, 2018.
2020	Refuge System stats: As of September 30, 2020, the Refuge System had 568 refuges (146.6 million acres), 5 Marine National Monuments (685.7 million acres outside refuge boundaries) and 38 wetland management districts with waterfowl production areas in 211 counties (4.2 million acres). Another 19.1 million acres of Marine National Monuments are managed by the Refuge System but not under the Refuge Administration Act. Collectively, the Refuge System now manages over 856 million acres of lands and waters (about 760 million acres in Marine National Monuments). Recreation visits during FY 2020 were 61.4 million. The FY 2020 operations and maintenance budget was \$502.2 million; the workforce included an estimated 2,525 full time equivalents. 41,600 individuals contributed over 1.5 million hours of volunteer time to the Refuge System during FY 2020.
2021	“Refuge America's Wildest Places” published: This coffee table book by award winning photographer Ian Shive features iconic photos from the Refuge System ranging from rugged reaches of Alaska, to the vibrant coral reefs of the Pacific Island refuges. It includes a foreword by former Refuge System Chief Jim Kurth and essays from conservation organizations such as the National Wildlife Refuge Association, Earth Island Institute, and the Arctic Refuge Defense Campaign, giving context to photos of some of the Refuge Systems natural wonders. Over 300 images from more than 40 refuges are included. For a video on the author’s experiences photographing refuges see https://www.youtube.com/watch?v=tVKlrUYReIE&t=73s
2021	“Memories of a Wildlife Biologist in Alaska” published: “Thirty of Forty in the 49th: Memories of a Wildlife Biologist in Alaska” by Robin West is published. It contains memoirs of 30 years with the FWS in Alaska, sharing personal stories and touching on key environmental issues of the time: designation of wilderness, subsistence use of fish and wildlife, and the spiritual connection people have with pristine far-away places. From the seat of a canoe on a 2019 post-retirement solo trip down the Yukon River, the author shares both highlights of the current trip and memories from the previous four decades. He concludes that Alaska and the world are changing, but thanks to the foresight and hard work of many, much of the wild treasures of Alaska are protected - being much the same now as in decades past, and with the hope that they will always remain so.
2021	FWS 150-year history video completed: The FWS National Conservation Training Center releases the video “A History of the U.S. Fish and Wildlife Service”. https://www.facebook.com/USFWSHISTORY/videos/928507914637939 . It describes the 150-year history of the FWS and includes many references to the Refuge System. A companion Conservation History Journal edition was published in 2022 https://www.fws.gov/sites/default/files/documents/2022-CH-Journal-150th-REM-V6.pdf
2021	National Bison Range transferred out of Refuge System: On June 23, 2021, the Department of the Interior announced that all lands comprising the National Bison Range (approximately 18,800 acres), are being transferred from the FWS to the Bureau of Indian Affairs to be held in trust for the Confederated Salish and Kootenai Tribes of the Flathead Reservation in Montana. The lands, which have been part of the National Wildlife Refuge System since 1908 are completely within the boundaries of the Flathead Reservation. The Consolidated Appropriations Act, 2021 (Public Law 116-260), directed the transfer by repealing the statute that created the National Bison Range and directing transition of the Range’s management from the FWS to the Tribes within 2 years.
2021	Former Refuge Manager publishes 7th book: Gary Kramer who had a 26-year career with the Refuge System publishes his seventh book – “Waterfowl of the World”. An award-winning

	<p>photographer and author, he has numerous publications and photos to his credit. His other six books: "Game Birds - A Celebration of North American Upland Birds" (2016), "Wingshooting the World" (2010), "Flyways - A Celebration of Waterfowl and Wetlands" (2006), "California Wildlife Impressions" (2006), "A Ducks Unlimited Guide to Hunting Diving & Sea Ducks" (2003), and "The Complete Guide to Hunting Wild Boar in California" (2003). For additional information on his works, see https://www.garykramer.net/bio</p>
2022	<p>"Rogue River Revived" Published: "Rogue River Revived: How People Are Bringing Their River Back to Life" (John H. Hartig and Jim Graham, Editors) describes the history and restoration of an important watershed in urban Detroit. The Rouge River has a mostly urbanized watershed of about 500 square miles populated by nearly 1.4 million people. The river has played an outsized role in the history of southeast Michigan, most famously housing Ford Motor Company's massive Rouge Factory. In recent decades, the story of the Rouge River has also been one of grassroots environmental activism. After pollution from the Ford complex and neighboring factories literally caused the river to catch fire in 1969, community groups launched a Herculean effort to restore and protect the watershed. Today the Rouge stands as one of the most successful examples of urban river revival in the country. Senior editor John Hartig is the former manager of Detroit River International Wildlife Refuge (the only international refuge in the Refuge System). The refuge has been and continues to be an active partner in restoring environmental values to the area and providing for their associated public enjoyment.</p>



Loggerhead turtle hatchling at Pea Island NWR, North Carolina

WHERE ARE WE TODAY AND WHAT HAVE WE LEARNED?

Today's Refuge System is a conservation success story worthy of celebration.

- At nearly 856 million acres, it is the world's largest assemblage of lands and waters devoted to the conservation of fish, wildlife, and plants
- With protected lands in every state plus in U.S. Territories, the diversity of habitats within the System is tremendous
- Sensitive habitats for colonial nesting birds, identified early in the history of the Refuge System, are protected especially in coastal areas
- Larger refuges in the contiguous 48 states conserve iconic big game mammals
- Conservation of North America's waterfowl is a prominent feature of the system through establishment and management of refuges that meet nesting, migration, and overwintering needs and through protection of 4 million acres of nesting and migration habitats in the wetlands acquisition program
- Through the combined efforts of state and federal governments (the Refuge System playing a key role) as well as private entities, waterfowl populations in the U.S. increased by 56% between 1969 and 2019. This demonstrates that a concerted effort of habitat protection and management can successfully recover wildlife.
- 16 refuges protect large areas of Alaska (77 million acres) that provide wild, remote, internationally significant wildlife habitats
- With over 20 million acres of federally designated Wilderness (mostly in Alaska), the Refuge System protects nearly 20% of the nation's Wilderness
- Five Marine National Monuments protect 760 million acres of diverse marine habitats
- Other "Special Designations" point out the uniqueness of refuge lands. They include Marine Protected Areas, National Historic Landmarks, National Monuments, National Natural Landmarks, National Recreation Trails, Ramsar Wetlands of International Importance, Research Natural Areas, Western Hemisphere Shorebird Reserves, Wild and Scenic Rivers, and World Heritage Sites
- Conservation and recovery of endangered species is increasingly important; over 380 species of threatened and endangered species occur on refuges and protected lands within the Refuge System offer tremendous potential for species recovery
- 65 million visits in fiscal year 2021 indicates a large number of people enjoy the System (see graph on next page); in addition, over 35,000 individuals volunteer on refuges each year and about 200 Friends organizations work in support of goals shared with refuges
- The System's employees and dedicated volunteers have developed extensive expertise in management of conservation lands and in welcoming and orienting visitors
- The Refuge System Improvement Act of 1997 and associated implementation actions provide a firm foundation for enlightened management of conservation lands
- The graph on the next page displays Refuge System visitation for FY 2021 with a total of 65 million visits. The number of participants is displayed in millions (addition of individual elements totals more than 65 million as visitors often participated in multiple activities)



Hunting

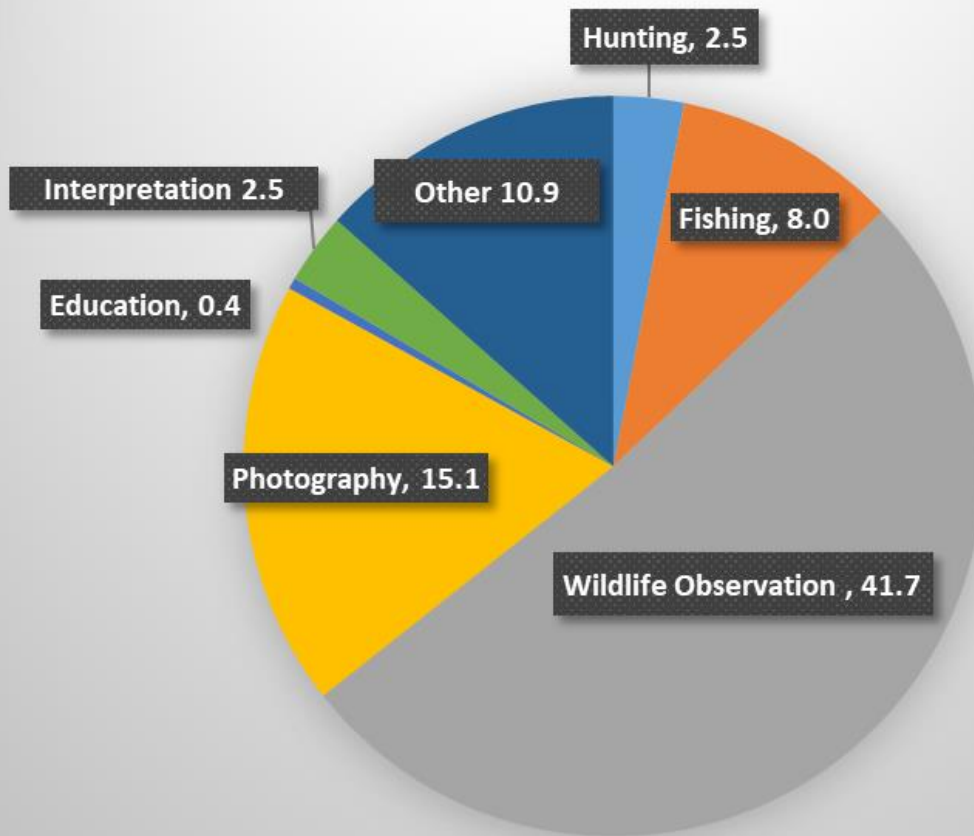


Wildlife Observation



Fishing

FY 21 Visits (millions)



Photography



Education



Interpretation

Despite Refuge System successes, many challenges still remain. Among them:

- continued worldwide human population growth, loss of biodiversity, and climate change stressors are occurring at a rate that does not bode well for fish, wildlife and plants; major commitments are needed to counter these stressors
- many threats to refuge resources originate outside refuge boundaries (contaminants by air or water, adequate water quantities, etc.)
- some uses of refuge lands in many cases are not within the control of the Refuge System (mineral and oil and gas extraction, for example)
- habitats for the full suite of America's fish and wildlife are not represented within the System (some species are well protected but habitats for many species are poorly represented within the System)
- despite major efforts to eliminate incompatible uses of refuges, there are always those wanting to use refuges for private gain to the exclusion of public benefits
- historic abuses of lands that occurred prior to their being established as refuges continue to present restoration challenges
- while most users of refuges are good stewards, there are a small minority that abuse resources and staffing is often not sufficient to deter illegal activities
- many refuges are located in environmentally sensitive areas such as coastal zones where they are susceptible to storm damages and other perturbations associated with sea level rise, salt water intrusion, or increasing storm damages due to climate change
- funding and staffing have historically been meager and continue to be insufficient to carry out objectives; the Refuge System is obscure - buried within the multi-program FWS and it is not well known among the general public (Sometimes referred to as hidden lands, the System tends to get overlooked in public policy and funding considerations)



California quail at Tule Lake NWR, CA

Looking back on the history of the Refuge System provides some key lessons learned about how best to move forward in pursuing the System's mission of conserving the nation's fish, wildlife, and plants for the enjoyment of present and future generations of Americans:

1. Conservation is a cooperative effort – a combination of at times leading, always engaging and at times following partners is essential. The System's history is filled with cooperative efforts with private citizens; local, state, and federal agencies; tribes, and non-government conservation organizations. Hands-on help is often provided by a dedicated corps of volunteers and "Friends".
2. Permanently protecting lands and waters through ownership or permanent easement is not the only method needed to conserve fish, wildlife and plants but it is the most secure and reliable method for conservation and gives the greatest ability to deal with future challenges.
3. Conservation is a matter of values, the human spirit, and our connection to nature. Numerous individuals have recognized this through time. Among them are Thoreau in his "in wildness is the preservation of the world", Hornaday and his campaign to bring back the bison, Teddy Roosevelt and his passion to protect nesting birds and big game, Leopold and his "land ethic", Ding Darling and Franklin Roosevelt's drive to "save the ducks", J. Clark Salyer's energy and dedication to systematically establish and manage conservation lands, to Zahniser and the Muries in their dedication to Wilderness, and more recently former Director Lynn Greenwalt's continued encouragement to refuge advocates to "save the dirt". Without their passion and leadership, the Refuge System would not be what it is today.
4. Refuges must be managed in a landscape context; not in isolation. Factors to be incorporated include life requisites of wildlife that cross international boundaries in their travels, understanding of conservation efforts by others and their impact, air quality and water quality impacts from surrounding areas, making connections with other protected areas, considering climate perturbations, etc.
5. Protecting lands through ownership is a strong beginning but habitat restoration and management is frequently needed to provide for the needs of fish, wildlife and plants. The Refuge System is the leader among land management entities when it comes to managing habitats for wildlife. A variety of methods including water level manipulation, prescribed fire, vegetation control, invasive species control, and reintroduction of threatened or endangered species are mainstays of refuge management.
6. Welcoming and orienting visitors is a critical need in today's world. With America's population growing more and more urban and with more and more people living lives estranged from nature, the demand for visitation to refuges continues to grow and correspondingly, there is a growing need to provide staffing or volunteer presence to accommodate visitors. Also, despite the fact that the overwhelming majority of visitors to refuges come with no ill intent, there are always some who would violate rules and abuse wildlife or visitors to wildlife lands; therefore, law enforcement presence is needed as part of the equation.
7. The Refuge System is not yet complete. Since establishment of the first national wildlife refuge in 1903, the U.S. population has grown from 80 million (58% rural) to over 330 million (18% rural); the world population grew from 1.6 to 8 billion. The Refuge System

has been a tremendous success story in conserving fish, wildlife and plants but in the face of growing U.S. and world human populations there remains much to be done. The impacts of mounting pressures of a growing human population with its demand for limited resources and the associated production of waste byproducts on our nation's fish, wildlife and plants is illustrated by the following:

- a. A 2019 analysis published in the journal Science "The Decline of the North American Avifauna" <https://www.3billionbirds.org/findings> [Nearly 3 Billion Birds Gone | Birds, Cornell Lab of Ornithology](#) : [Birds, Cornell Lab of Ornithology](#) indicates that wild bird populations in the continental U.S. and Canada have declined by almost 30% since 1970. More than 90% of the total loss (more than 2.5 billion birds) comes from just 12 avian families, including sparrows, blackbirds, and finches. The study authors say their work doesn't just show a massive loss of birdlife, but a pervasive loss that reaches into every biome in the U.S. and Canada. These bird losses are a strong signal that our human-altered landscapes are losing their ability to support birdlife. Forests alone have lost 1 billion birds. Grassland birds collectively have declined by more than 50%, or more than 700 million birds. Habitat loss is likely a driving factor in these declines, particularly agricultural intensification and development. Not all the news out of this analysis is dire. Some groups of birds are doing well, and for good reason—governments and societies have invested in saving them. Raptors, waterfowl, and turkeys show what's possible when commitments are made to bird conservation.
- b. As of June 2022, 732 species of animals and 941 species of plants were officially listed by the FWS as threatened or endangered in the U.S. Protection and management of lands within the Refuge System has proven to be one of the most effective methods available to recover endangered species.
- c. The National Wildlife Federation published a 2018 report describing America's present day wildlife crisis and suggesting corrective measures needed if we are to sustain what remains of our wildlife legacy https://www.nwf.org/-/media/Documents/PDFs/NWF-Reports/2018/Reversing-Americas-Wildlife-Crisis_2018.ash
- d. The daunting impacts of human population growth and climate change are resulting in a dramatic need for more protection of nature. There is presently a coalescing among the scientific and conservation community about establishing a bold goal of protecting 30 percent of the landscape by the year 2030. This goal was established by the International Union for the Conservation of Nature in 2016 and is also receiving increased attention in the U.S. as evidenced by the House Resolution introduced in 2020 by now Secretary of Interior Debra Haaland [Text - H.Res.835 - 116th Congress \(2019-2020\): Expressing the sense of the House of Representatives that the Federal Government should establish a national goal of conserving at least 30 percent of the land and ocean of the United States by 2030.](#) and by Executive Order 14008 "Tackling the Climate Crisis at Home and Abroad" issued by President Biden in January 2021 [Tackling the Climate Crisis at Home and Abroad](#), see Section 216) which directs the Secretary of Interior to in consultation with others recommend methods to achieve the goal of conserving at least 30 percent of our lands and waters by 2030 (currently an estimated 12 percent of U.S. lands are in the "protected"

category). A preliminary report providing principles for this initiative was released in May 2021 [Report: Conserving and Restoring America the Beautiful 2021](#).

These and other analyses confirm that additional protected lands are needed if we are to pass on our nation's natural legacy to future generations.

8. The Refuge System is at its finest when it acts as a system. From its rather obscure early beginnings and at various stages throughout its history, it has at times been described using such terms as lacking consistent direction, lacking a clear mission, a confederacy of refuges, or a balkanized bunch. The implication of these sorts of statements being that the Refuge System was fragmented and less than effective. The Refuge System has been most effective in pursuing its mission (which was clarified and articulated in the 1997 Improvement Act) when it coalesces on common objectives and takes a consistent approach to implementing policy. Guarding against fragmentation and continuing to think and act as a System in pursuing the Refuge Systems noble mission will do much to help the Refuge System meet the challenges of the future.



Sandhill cranes at Bosque del Apache NWR, NM

Table 8 at the end of this document shows the status of current units of the Refuge System (September 30, 2022). It lists individual refuges and wetland management districts by state (refuges with lands in multiple states are under the state with the largest acreage), the acres of lands or waters protected, the establishment date, the relative order in which units entered the System, and the presence of selected special designations.

THE FUTURE: CONTINUED STEWARDSHIP AND GROWTH NEEDED TO SECURE A NATURAL LEGACY FOR FUTURE GENERATIONS

The American character has been molded by its connections with its lands and waters. Its spirit is fortified by close connections to the wild creatures of prairie, forest, mountain, desert, coast, marsh, ocean, reef, and river. The Refuge System, working in association with many partners, plays a key role in preserving this “wild legacy.” Two critical components of enabling the Refuge System to further this “wild legacy” are: 1) assuring that existing lands and waters in the System are maintained in a healthy condition; and 2) strategically growing the System so that all ecosystems within the U.S. receive conservation protection. Both of these goals are undergirded in law as described below.

TAKE CARE OF EXISTING REFUGE SYSTEM UNITS

The National Wildlife Refuge System Improvement Act of 1997 provides the Refuge System with the mission “to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.” The Act further directs managers to “ensure that the biological integrity, diversity, and environmental health of the System are maintained”.

The Refuge System has a strong history of excellence in land and water conservation and in providing quality wildlife-oriented recreation opportunities; however, major challenges still remain. All refuge lands and waters face resource threats from either within or outside their boundaries. Protecting areas through land acquisition or protective designations provides tremendous conservation benefits; however, active intervention/management is needed to assure that healthy, productive environments are in place. Refuge System lands and waters are diverse in character and location so there is no one size fits all formula but experience has shown that three types of intervention/management are needed.

Successful Refuge System managers/caretakers must actively engage in 3 interacting roles as guardians, gardeners, and hosts. A brief overview of these 3 roles is below:

- 1) The “Guardian” role includes traditional law enforcement roles of preventing trespass, poaching, illegal take of timber, illegal grazing, crimes against visitors and employees, and crimes against government property, etc. but also functions such as:
 - conservation education and community engagement;
 - responding to natural disasters such as wildfires and floods;
 - ensuring that the unique values of Wilderness, other Special Designation Areas, and cultural resources are protected;
 - monitoring and responding to outside threats such as air and water quality,
 - documenting, posting, and defending ownership boundaries; and
 - monitoring terms of easements or other agreements.
- 2) The “Gardener” role includes:
 - assessing the status and trends of fish, wildlife, plants and their habitats (both those presently in place and those historically present) and using this information

along with an understanding of natural features of the area, threats to resources, and opportunities for conservation to determine appropriate response strategies;

- coordinating refuge conservation efforts with those of other natural resource entities at the federal, state, tribal, and non-government level;
- improving habitats by actions such as restoring or managing wetlands (this often includes a major associated effort of constructing and maintaining water control structures), conducting prescribed burns, controlling invasive species, conducting controlled grazing, planting food crops, and other vegetation control;
- improving populations by actions such as control of invasive species or predators, disease monitoring and control, reintroducing species to areas historically used, and regulating take through hunting, fishing and trapping;
- providing facilities, vehicles, and equipment where needed and maintaining them in reliable working condition.

The Refuge System has a strong record and continues to excel at restoring degraded fish and wildlife habitats and recovering rare or endangered species.

3) The “Host” role involves welcoming and orienting human visitors to System lands and waters so that they can enjoy quality experiences and are invited to join in conserving nature. Quality wildlife dependent recreation and education experiences enhance the quality of life for our nation’s citizens and furthers the mission of the Refuge System in many ways, including:

- elevating the suite of priority wildlife-dependent uses that focus on the visitor’s relationship with wildlife (priority uses described in the Refuge System Improvement Act of 1997)
- making fish, wildlife and plants relevant, meaningful, and accessible to the American public
- instilling a sense of ownership, understanding, wonder, and appreciation for fish, wildlife, and plants
- engaging the public in, and increasing community support for, the conservation mission of the System
- affording our citizens with meaningful opportunities to assist in achieving the Refuge System mission by volunteering, working with Friends groups, or cooperatively completing projects on refuges.

“We must tell our stories with the heart of a poet and the facts of a scientist as we engage Americans in the stewardship of our land.”
- Former NWRS Chief Greg Siekaniec, 2011 Conserving the Future Conference

CONTINUE TO STRATEGICALLY GROW THE SYSTEM

The National Wildlife Refuge System Improvement Act of 1997 provides the Refuge System with the mission “to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.” The Act further directs the Secretary of the Interior to “ensure that the biological integrity, diversity, and environmental health of the System are maintained”; and “plan and direct the continued growth of the System in a manner that is best designed to accomplish the mission of the System, to contribute to the conservation of the ecosystems of the United States, to complement efforts of States and other Federal agencies to conserve fish and wildlife and their habitats, and to increase support for the System and participation from conservation partners and the public.”

“If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering”.
- Aldo Leopold in Round River: From the Journals of Aldo Leopold

Today, many ecosystems of the U.S. are not under conservation protection and the Refuge System is still unfinished. Much remains to be done if the System is to safeguard representative areas for all ecosystems of the country. Today the nation faces daunting challenges of human population growth and climate change that are placing increasing stress on the natural world. Endangered species and imperiled habitats abound. The nation is at a pivotal point where failure to act will mean that future generations will inherit an impoverished natural legacy.

There is a continuing need to respond to the below questions:

1. What remains to be done to assure that existing Refuge System lands and waters are healthy?
2. What does a complete National Wildlife Refuge System look like?
3. What gaps remain for the System and how best can we fill them?
4. How do we best accommodate increasing numbers of visitors and provide quality recreation experiences without harming natural values?

Providing a healthy and complete National Wildlife Refuge System, as envisioned by past generations of conservationists, would stand as a treasured testament to the nation’s ability to pass on a lasting natural legacy to future generations.

“Everybody needs beauty as well as bread, places to play in and pray in, where nature may heal and give strength to body and soul.” -- John Muir

ENGAGE WITH PARTNERS

The Refuge System is well poised to work with partners from all sectors (federal and state agencies, tribes, non-government organizations, business, and individuals) to reduce the specter of handing an impoverished natural legacy to future generations. The Refuge System’s history of expertise in restoration ecology, adeptness at working with a wide variety of partners,

adaptability in land acquisition and management strategies, and the ability to provide opportunities for Americans to get onto the land and enjoy nature firsthand bode well for the future.

Local communities and citizens have long played an important role in the history and stewardship of the Refuge System. Due to the number of units, the expansive acreage of the Refuge System, and a budget that is only about a quarter as large as the much smaller National Park Service, the NWRS relies on collaboration with diverse groups and citizens to conserve America's wildlife. Whether it is our long-time partnership with private landowners to conserve wildlife habitat; daily collaboration with thousands of volunteers to teach children about nature; working with neighbors to respond to emergency needs from floods and hurricanes; or newer collaborations with urban communities, the Refuge System has long seen its successes grow from strong relationships with local communities.

Volunteers — by far our largest collaborators -- contribute nearly 20 percent of the work hours performed on refuges. Volunteers of all ages, backgrounds, and interests facilitate recreation activities, habitat restoration, maintenance, administrative activities, and many other critical tasks. In FY 2019, over 38,000 volunteers contributed over 1.3 million hours of service to the Refuge System.

Refuges also have the advantage of our close partners: Friends organizations. Refuges work alongside approximately 200 nonprofit Refuge Friends organizations that assist more than 300 refuges. These independent non-profit organizations are critical to building effective community relationships, leveraging resources, and serving as conservation ambassadors in their communities.

When a full-fledged Friends organization doesn't completely fit a community's needs, refuges innovate with other community partners to work together on a mutually beneficial project (for example, hosting an annual birding festival). These groups could include local chambers of commerce, state wildlife agencies, youth groups, faith-based groups, and even private businesses. One of the Refuge System's most visible current community partnerships is through the growing Urban Wildlife Conservation Program, which works to connect America's urban communities with the concept and goals of wildlife conservation and stewardship.



Volunteer at Cape Romain NWR in South Carolina helps relocate sea turtle nests to increase survival of hatchlings.

SO HOW CAN I HELP?

The history of the National Wildlife Refuge System is replete with examples of private citizens, organizations, and government employees who cared deeply about our natural world and who had the foresight to see that establishing or providing for the proper caretaking of national wildlife refuges is an ideal way of securing a natural legacy for future generations. Congressman Ralph Regula (Chair, House Appropriations Subcommittee for Interior and Related Agencies 1995-2000) encouraged everyone who enjoys nature to be an ambassador for the National Wildlife Refuge System. An ambassador shares the vision and engages others in taking action to implement the vision.

In a related vein, the 23 member organizations of the Cooperative Alliance for Refuge Enhancement have set aside some policy differences and agreed that the vital link to making the Refuge System what it is intended to be is to provide adequate funding <https://static1.squarespace.com/static/5c2a3500f793923866cf19b8/t/63331cf048619320902ce366/1664294144790/A+History+of+CARE.pdf>. Thus they are serving as ambassadors advocating for funding the Refuge System to enable effective delivery of its noble conservation mission.

So if you care about nature and the natural heritage we will leave to future generations, we invite you to join us as we strive to make the National Wildlife Refuge System the best that it can be. Let's build on the work of others who have gone before and strive for a bright future ahead. Opportunities await no matter your background, interests, or geographic location. They include the following:

1. **Learn about your local refuge as well as the Refuge System as a whole** – The starting point of being able to help your local refuge or the Refuge System in its entirety is to learn about the challenges being faced and opportunities that are available. Key factors to develop an understanding of include threats to natural resources on refuge lands and waters, benefits of management approaches, trade-offs between public use and natural resource benefits, adequacy of funding and staffing, and opportunities to develop new or improve existing efforts. It is much more helpful for you to be a student of the Refuge System as a whole and not just your local refuge. Success of your local refuge is intimately tied to the success of the entire Refuge System.

“It is not the critic who counts; not the man who points out how the strong man stumbled or where the doer of deeds could have done better. The credit belongs to the man who is actually in the arena, whose face is marred by dust and sweat and blood; who strives valiantly; who errs and comes short again and again; because there is no effort without error and shortcomings; but who knows the great enthusiasm, the great devotion; who spends himself in a worthy cause; who at best knows in the end the triumph of high achievement, and who at the worst, if he fails, at least fails while daring greatly, so that this place shall never be with those cold and timid souls who never know either victory or defeat.”

-- Theodore Roosevelt

2. **Volunteer** – Volunteering at your local refuge can offer many rewards such as giving back to your community, engaging with visitors, learning new skills, joining a community of people with common interests, a sense of well-being by contributing to a worthy cause, etc. Contact your local refuge to discuss opportunities to match your skills and interests with the needs of the refuge. There are opportunities for all types of skills to be

applied, from habitat management and biological programs to hosting visitors to maintaining facilities to administrative work. There are also opportunities to be a “citizen scientist” through nationwide programs that the Refuge System partners with such as the National Phenology Network <https://fws.usanpn.org/phenology-refuges> and Cornell University’s e-bird program <https://ebird.org/explore#explore-refuges-panel>.

3. **Buy a “Duck Stamp”** – Funds from the sale of the Migratory Bird Hunting and Conservation Stamps are used to purchase lands for addition to the Refuge System. Stamps may be purchased anywhere hunting licenses are sold, at some Post Offices, and on-line (see [Migratory Bird Program | Conserving America's Birds](#)).
4. **Join a Friends organization** – These non-profit organizations have the primary purpose of supporting a refuge or group of refuges. Joining a Friends organization can have various levels of participation but in general is a longer term and more involved way of supporting a refuge than being a volunteer. If your local refuge does not have a Friends organization consider talking with others interested in the refuge and start a new Friends organization. The National Wildlife Refuge Association has long been an advocate of growing and strengthening Friends organizations and is available to help. A more recently established non-profit organization, the Coalition of Refuge Friends and Advocates focuses solely on FWS Friends organizations and partners with the National Wildlife Refuge Association in equipping and supporting Friends groups <https://coalitionofrefugefriends.com/>.
5. **Be part of a community partnership effort** – Your local refuge may hold one-time or recurring special events working in conjunction with local community groups or individuals. Examples include birding festivals, habitat restoration projects, hunting or fishing events, art or photography contests, etc. Your assistance in preparing for and completing these events is helpful to the success of the overall effort.

“Never doubt that a small thoughtful group of concerned citizens can change the world.”

-- Margaret Mead

6. **Be an active advocate** – An advocate is someone who speaks or writes in support of an individual refuge or the entire Refuge System. Whenever you advocate for your local refuge, please do so within the context of the Refuge System as a whole since a major strength of the Refuge System is that it provides secure habitats across our nation needed to preserve our nation’s natural legacy. Advocacy can take various forms including speaking to your friends and neighbors, providing input to refuge planning processes such as the development of Comprehensive Conservation Plans, speaking with government and non-government organizations, speaking at conferences or colloquia, speaking on behalf of the refuge or your Friends organization as a volunteer or at special events. Writing skills can be applied to editing or writing articles for Friends’ newsletters, writing articles for newspapers or magazines, preparing information items or correspondence for your Friends organization including in some cases Congressional testimony, and writing in-depth articles or books. Here is an article describing work of a dedicated advocate who worked on behalf of Don Edwards San Francisco Bay NWR <https://www.fws.gov/story/2021-09/south-bay-icon>.

Conservation photography can be an especially effective form of advocacy. The North American Nature Photography Association has published a helpful handbook on how to apply your photography skills to further nature conservation https://nanpa.informz.net/NANPA/pages/Handbook_ConservationPhotography. Speaking, writing, and photography whether applied individually or collectively can do much to touch hearts and minds. When used with a “sense of wonder”, a “sense of

place”, and a “take me there - make me care” approach, they are effective tools to encourage others to grow in appreciation and support of the exemplary work the Refuge System does to conserve nature and provide for its public enjoyment.. Artwork can also be applied as an advocacy element; one person’s experience as an artist in residence is described here [ALASKA NATIONAL WILDLIFE REFUGE PROJECT | LINDSAY CARRON](#)

One potential project to consider if you enjoy writing and have a favorite refuge you would like to support is to emulate what was done at Malheur NWR and assemble a document celebrating the legacy of the refuge.

https://www.google.com/books/edition/Malheur_s_legacy/gJh8LDL67k8C?hl=en&gbpv=1

Many refuges are approaching their centennial and a document of this type produced for the refuge of your choice would be an excellent tribute to the refuge as well as a good advocacy tool.

7. **Support the National Wildlife Refuge Association** – The National Wildlife Refuge Association is the leading independent voice defending the National Wildlife Refuge System. Work is enabled by donations and with the help of volunteers (learn more at [The National Wildlife Refuge Association](#)). The Refuge Association focuses solely on defending the integrity of the Refuge System. Often the first organization to learn of issues or threats to the Refuge System, we act as advocates and often rally other national conservation organizations to the cause.

Table 8. Refuge System units as of September 30, 2022

Below is select information about each individual refuge or wetland management district. Maps of each unit are at [Find a Wildlife Refuge!](#). Other sources of information about individual refuges or wetland management districts can be found on FWS websites for each unit, in Wikipedia (here is a jumping off point https://en.wikipedia.org/wiki/List_of_National_Wildlife_Refuges_of_the_United_States#) and at websites of Friends organizations that support refuge system units. Also there are a wide variety of videos for many units posted on Youtube.

Refuge or WMD Name	Established	Refuge Establishment Order	Primary State	9/30/22 Acres in Primary State	9/30/22 Acres in other States	Other State	Total Acres as of 9/30/22	Administration	SDAs
Bon Secour NWR	2/23/1979	372	Alabama	7,627			7,627	Jimmy Carter	MPA
Cahaba River NWR	9/25/2002	540	Alabama	4,854			4,854	George W. Bush	
Choctaw NWR	1/27/1964	262	Alabama	4,218			4,218	Lyndon B. Johnson	RNA
Eufaula NWR	9/1/1964	271	Alabama	7,953	3,231	GA	11,184	Lyndon B. Johnson	
Fern Cave NWR	10/28/1981	403	Alabama	199			199	Ronald Reagan	
Key Cave NWR	1/3/1997	506	Alabama	1,060			1,060	Bill Clinton	
Mountain Longleaf NWR	5/29/2003	542	Alabama	9,016			9,016	George W. Bush	
Sauta Cave NWR	9/16/1978	368	Alabama	264			264	Jimmy Carter	
Watercress Darter NWR	10/1/1980	386	Alabama	25			25	Jimmy Carter	
Wheeler NWR	7/7/1938	124	Alabama	34,431			34,431	Franklin D. Roosevelt	NNL, RNA
Alaska Maritime NWR	12/2/1980	389	Alaska	3,421,816			3,421,816	Jimmy Carter	MPA, NNL, NRT, RNA, WWSR, W
Alaska Peninsula NWR	12/2/1980	390	Alaska	3,574,938			3,574,938	Jimmy Carter	NM, NNL, NRT
Arctic NWR	12/6/1960	244	Alaska	19,287,376			19,287,616	Dwight D. Eisenhower	MPA, RNA, WSR, W
Becharof NWR	12/2/1980	391	Alaska	1,200,420			1,200,420	Jimmy Carter	W
Innoko NWR	12/2/1980	392	Alaska	3,850,960			3,850,960	Jimmy Carter	W
Izembek NWR	12/6/1960	245	Alaska	310,995			310,995	Dwight D. Eisenhower	NNL R, W
Kanutli NWR	12/2/1980	393	Alaska	1,430,320			1,430,320	Jimmy Carter	
Kenai NWR	12/16/1941	189	Alaska	1,913,347			1,913,347	Franklin D. Roosevelt	NRT, RNA, W
Kodiak NWR	8/19/1941	186	Alaska	1,881,361			1,881,361	Franklin D. Roosevelt	RNA
Koyukuk NWR	12/2/1980	394	Alaska	3,550,160			3,550,160	Jimmy Carter	W
Nowitna NWR	12/2/1980	395	Alaska	1,560,240			1,560,240	Jimmy Carter	WSR

Selawik NWR	12/2/1980	396	Alaska	2,151,840			2,151,840	Jimmy Carter	WSR, W
Tetlin NWR	12/2/1980	397	Alaska	700,287			700,287	Jimmy Carter	
Togiak NWR	12/2/1980	398	Alaska	4,104,286			4,104,286	Jimmy Carter	W
Yukon Delta NWR	12/2/1980	399	Alaska	19,226,962			19,226,962	Jimmy Carter	MPA, NNL, WHSR, WSR, W
Yukon Flats NWR	12/2/1980	400	Alaska	8,636,951			8,636,951	Jimmy Carter	NRT, WSR
Bill Williams River NWR	6/17/1993	484	Arizona	6,055			6,055	Bill Clinton	
Buenos Aires NWR	2/27/1985	422	Arizona	117,353			117,353	Ronald Reagan	NRT
Cabeza Prieta NWR	1/25/1939	134	Arizona	860,041			860,041	Franklin D. Roosevelt	RNA, W
Cibola NWR	8/21/1964	269	Arizona	13,199	5,245	CA	18,444	Lyndon B. Johnson	
Havasu NWR	1/22/1941	172	Arizona	30,280	7,235	CA	37,515	Franklin D. Roosevelt	NRT, RNA, W
Imperial NWR	2/14/1941	184	Arizona	17,810	8,198	CA	26,008	Franklin D. Roosevelt	W
Kofa NWR	1/25/1939	133	Arizona	666,641			666,641	Franklin D. Roosevelt	NRT, RNA, W
Leslie Canyon NWR	6/17/1993	485	Arizona	23,236			23,236	Bill Clinton	
San Bernardino NWR	4/1/1982	404	Arizona	2,369			2,369	Ronald Reagan	
Bald Knob NWR	9/22/1993	488	Arkansas	15,102			15,102	Bill Clinton	
Big Lake NWR	8/2/1915	33	Arkansas	11,065			11,065	Woodrow Wilson	NNL, RNA, W
Cache River NWR	6/16/1986	430	Arkansas	73,561			73,561	Ronald Reagan	
Dale Bumpers White River NWR	9/5/1935	82	Arkansas	160,445			160,445	Franklin D. Roosevelt	
Felsenthal NWR	5/19/1975	354	Arkansas	76,107			76,107	Gerald Ford	
Holla Bend NWR	8/30/1957	230	Arkansas	6,299			6,299	Dwight D. Eisenhower	RNA
Logan Cave NWR	3/14/1989	441	Arkansas	124			124	George H.W. Bush (Sr.)	
Overflow NWR	11/25/1980	388	Arkansas	13,426			13,426	Jimmy Carter	
Pond Creek NWR	8/12/1994	495	Arkansas	28,584			28,584	Bill Clinton	
Wapanocca NWR	2/1/1961	248	Arkansas	5,629			5,629	John F. Kennedy	
NE Canyons & Seamounts	9/15/2016		Atlantic Ocean	3,144,320			3,144,320	Barack Obama	
Antioch Dunes NWR	3/4/1980	380	California	67			67	Jimmy Carter	
Bitter Creek NWR	7/1/1985	423	California	14,164			14,164	Ronald Reagan	
Blue Ridge NWR	12/30/1982	406	California	917			917	Ronald Reagan	
Butte Sink WMA	3/4/1980	381	California	10,969			10,969	Jimmy Carter	
Castle Rock NWR	11/20/1980	387	California	14			14	Jimmy Carter	
Clear Lake NWR	4/11/1911	25	California	24,124			24,124	William Howard Taft	
Coachella Valley NWR	8/28/1985	426	California	3,578			3,578	Ronald Reagan	NNL, RNA

Colusa NWR	3/15/1944	200	California	4,040			4,040	Franklin D. Roosevelt	
Delevan NWR	9/12/1962	253	California	5,797			5,797	John F. Kennedy	
Don Edwards SF Bay NWR	10/8/1974	349	California	29,528			29,528	Gerald Ford	MPA, NRT, R, WHSR
Ellicott Slough NWR	11/21/1975	357	California	200			200	Gerald Ford	
Farallon NWR	2/27/1909	22	California	211			211	Theodore Roosevelt	MPA, W
Grasslands WMA	7/27/1979	377	California	94,997			94,997	Jimmy Carter	R, WHSR
Guadalupe-Nipomo Dunes NWR	8/1/2000	527	California	2,553			2,553	Bill Clinton	
Hopper Mountain NWR	12/18/1974	350	California	2,471			2,471	Gerald Ford	
Humboldt Bay NWR	4/4/1973	326	California	3,740			3,740	Richard Nixon	WHSR, NNL
Kern NWR	11/18/1960	242	California	11,249			11,249	Dwight D. Eisenhower	RNA
Lower Klamath NWR	8/8/1908	12	California	44,295	6,618	OR	50,913	Theodore Roosevelt	
Marin Islands NWR	4/16/1992	473	California	131			131	George H.W. Bush (Sr.)	MPA
Merced NWR	7/30/1951	219	California	3,804			3,804	Harry S. Truman	
Modoc NWR	11/5/1960	241	California	7,576			7,576	Dwight D. Eisenhower	
Pixley NWR	11/6/1958	234	California	7,404			7,404	Dwight D. Eisenhower	
Sacramento NWR	2/27/1937	104	California	10,856			10,856	Franklin D. Roosevelt	
Sacramento River NWR	9/21/1989	447	California	11,768			11,768	George H.W. Bush (Sr.)	
Salinas River NWR	6/27/1973	330	California	367			367	Richard Nixon	
San Diego NWR	4/10/1996	501	California	12,448			12,448	Bill Clinton	
San Diego Bay NWR	8/12/1988	438	California	2,615			2,615	Ronald Reagan	MPA
San Joaquin River NWR	12/2/1987	436	California	11,794			11,794	Ronald Reagan	
San Luis NWR	2/2/1967	288	California	18,296			18,296	Lyndon B. Johnson	
San Pablo Bay NWR	2/6/1974	338	California	20,309			20,309	Richard Nixon	MPA
Seal Beach NWR	7/5/1974	345	California	1,024			1,024	Richard Nixon	
Sonny Bono Salton Sea NWR	11/25/1930	53	California	37,899			37,899	Herbert Hoover	WHSR
Steve Thompson North Central Valley WMA	10/23/1991	466	California	17,846			17,846	George H.W. Bush (Sr.)	
Stone Lakes NWR	10/12/1994	498	California	6,684			6,684	Bill Clinton	
Sutter NWR	3/30/1945	206	California	2,590			2,590	Franklin D. Roosevelt	
Tijuana Slough NWR	12/24/1980	401	California	1,079			1,079	Jimmy Carter	
Tulare Basin Wildlife Management Area	3/22/2010	552	California	4,439			4,439	Barack Obama	
Tule Lake NWR	10/4/1928	46	California	39,983			39,983	Calvin Coolidge	NM
Willow Creek-Lurline WMA	8/7/1985	425	California	5,978			5,978	Ronald Reagan	
Buck Island NWR	1/8/1969	299	Caribbean Islands	46			46	Lyndon B. Johnson	

Cabo Rojo NWR	5/20/1974	340	Caribbean Islands	1,857			1,857	Richard Nixon	NNL
Culebra NWR	2/27/1909	23	Caribbean Islands	1,561			1,561	Theodore Roosevelt	
Desecheo NWR	12/22/1976	363	Caribbean Islands	360			360	Gerald Ford	
Green Cay NWR	12/19/1977	365	Caribbean Islands	14			14	Jimmy Carter	NNL
Laguna Cartagena NWR	8/8/1989	445	Caribbean Islands	1,036			1,036	George H.W. Bush (Sr.)	
Navassa Island NWR	4/22/1999	514	Caribbean Islands	364,950			364,950	Bill Clinton	
Sandy Point NWR	8/30/1984	417	Caribbean Islands	530			530	Ronald Reagan	NNL
Vieques NWR	5/1/2001	535	Caribbean Islands	17,771			17,771	George W. Bush	
Alamosa NWR	7/25/1963	257	Colorado	12,026			12,026	John F. Kennedy	NRT
Arapaho NWR	9/26/1967	289	Colorado	25,521			25,521	Lyndon B. Johnson	
Baca NWR	4/10/2003	541	Colorado	85,954			85,954	George W. Bush	
Browns Park NWR	7/13/1965	277	Colorado	12,150			12,150	Lyndon B. Johnson	
Monte Vista NWR	9/3/1952	220	Colorado	16,280			16,280	Harry S. Truman	NRT, RNA
Rocky Flats NWR	7/12/2007	548	Colorado	5,237			5,237	George W. Bush	
Rocky Mtn. Arsenal NWR	10/9/1992	479	Colorado	15,988			15,988	Bill Clinton	NRT
San Luis Valley Conservation Area	9/14/2018	567	Colorado	162			162	Donald Trump	
Sangre de Cristo Conservation Area	9/14/2012	558	Colorado	184,219			184,219	Barack Obama	
Two Ponds NWR	5/26/1992	475	Colorado	72			72	George H.W. Bush (Sr.)	NRT
Stewart B. McKinney NWR	2/25/1985	421	Connecticut	1,010			1,010	Ronald Reagan	MPA
Bombay Hook NWR	6/22/1937	108	Delaware	16,331			16,331	Franklin D. Roosevelt	MPA, RNA, WHSR
Prime Hook NWR	8/8/1963	259	Delaware	10,163			10,163	John F. Kennedy	MPA, WSR
Archie Carr NWR	6/25/1991	464	Florida	255			255	George H.W. Bush (Sr.)	
Arthur R. Marshall Loxahatchee NWR	6/8/1951	218	Florida	145,218			145,218	Harry S. Truman	RNA
Caloosahatchee NWR	7/1/1920	35	Florida	40			40	Woodrow Wilson	
Cedar Keys NWR	7/16/1929	48	Florida	891			891	Herbert Hoover	MPA, W
Chassahowitzka NWR	12/22/1941	190	Florida	30,843			30,843	Franklin D. Roosevelt	MPA, W
Crocodile Lake NWR	5/22/1979	375	Florida	6,708			6,708	Jimmy Carter	MPA
Crystal River NWR	8/17/1983	409	Florida	140			140	Ronald Reagan	MPA
Egmont Key NWR	7/10/1974	347	Florida	328			328	Richard Nixon	
Everglades Headwaters NWR & Conservation Area	1/18/2012	556	Florida	12,174			12,174	Barack Obama	
Florida Panther NWR	6/1/1989	442	Florida	26,610			26,610	George H.W. Bush (Sr.)	
Great White Heron NWR	10/27/1938	131	Florida	117,723			117,723	Franklin D. Roosevelt	MPA, W

Island Bay NWR	10/23/1908	17	Florida	20			20	Theodore Roosevelt	MPA, W
J. N. Ding Darling NWR	12/1/1945	208	Florida	6,525			6,525	Harry S. Truman	MPA, RNA, W
Key West NWR	8/8/1908	11	Florida	208,322			208,322	Theodore Roosevelt	MPA, W
Lake Wales Ridge NWR	4/22/1994	493	Florida	1,873			1,873	Bill Clinton	
Lake Woodruff NWR	11/18/1963	261	Florida	21,159			21,159	John F. Kennedy	RNA, W
Lower Suwannee NWR	5/5/1979	374	Florida	52,472			52,472	Jimmy Carter	MPA
Matlacha Pass NWR	9/26/1908	16	Florida	565			565	Theodore Roosevelt	MPA
Merritt Island NWR	8/28/1963	260	Florida	139,196			139,196	John F. Kennedy	MPA
Nathaniel P. Reed NWR	9/23/1968	294	Florida	1,089			1,089	Lyndon B. Johnson	NNL
National Key Deer Refuge	8/22/1957	229	Florida	84,958			84,958	Dwight D. Eisenhower	MPA, RNA, W
Passage Key NWR	10/10/1905	4	Florida	64			64	Theodore Roosevelt	W
Pelican Island NWR	3/14/1903	1	Florida	5,410			5,410	Theodore Roosevelt	MPA, NRT, R, W
Pine Island NWR	9/15/1908	15	Florida	608			608	Theodore Roosevelt	MPA
Pinellas NWR	4/1/1951	217	Florida	394			394	Harry S. Truman	MPA
St. Johns NWR	8/16/1971	311	Florida	6,257			6,257	Richard Nixon	
St. Marks NWR	3/9/1931	55	Florida	85,436			85,436	Herbert Hoover	MPA, RNA, W
St. Vincent NWR	2/12/1968	292	Florida	12,494			12,494	Lyndon B. Johnson	MPA
Ten Thousand Islands NWR	12/18/1996	505	Florida	35,049			35,049	Bill Clinton	MPA
Banks Lake NWR	2/22/19850	420	Georgia	3,559			3,559	Jimmy Carter	
Blackbeard Island NWR	2/15/1924	39	Georgia	5,618			5,618	Calvin Coolidge	MPA, RNA, WHSR, W
Bond Swamp NWR	10/16/1989	448	Georgia	7,581			7,581	George H.W. Bush (Sr.)	
Harris Neck NWR	5/25/1962	252	Georgia	3,231			3,231	John F. Kennedy	MPA, WHSR
Okefenokee NWR	3/30/1937	106	Georgia	403,241	3,695	FL	406,936	Franklin D. Roosevelt	NNL, NRT, R RNA, W
Piedmont NWR	1/18/1939	132	Georgia	34,966			34,966	Franklin D. Roosevelt	RNA
Savannah NWR	4/6/1927	42	Georgia	16,253	15,294	SC	31,547	Calvin Coolidge	WHSR
Wassaw NWR	10/20/1969	303	Georgia	10,053			10,053	Richard Nixon	MPA, NNL, WHSR
Wolf Island NWR	4/3/1930	52	Georgia	5,126			5,126	Herbert Hoover	MPA, WHSR, W
Hakalau Forest NWR	10/29/1985	428	Hawaii	48,279			48,279	Ronald Reagan	

Hanalei NWR	11/30/1972	323	Hawaii	923			923	Richard Nixon	
Hawaiian Islands NWR	2/3/1909	18	Hawaii	254,418			254,418	Theodore Roosevelt	MPA, MNM
Huleia NWR	6/25/1973	329	Hawaii	241			241	Richard Nixon	
James Campbell NWR	12/17/1976	362	Hawaii	1,095			1,095	Gerald Ford	
Kakahaia NWR	3/15/1976	360	Hawaii	45			45	Gerald Ford	
Kealia Pond NWR	12/8/1992	482	Hawaii	704			704	George H.W. Bush (Sr.)	
Kilauea Point NWR	12/19/1984	418	Hawaii	199			199	Ronald Reagan	
Oahu Forest NWR	12/21/2000	531	Hawaii	4,570			4,570	Bill Clinton	
Pearl Harbor NWR	10/17/1972	321	Hawaii	113			113	Richard Nixon	
Bear Lake NWR	5/9/1968	293	Idaho	18,302			18,302	Lyndon B. Johnson	
Camas NWR	10/8/1937	114	Idaho	10,657			10,657	Franklin D. Roosevelt	
Deer Flat NWR	2/25/1909	19	Idaho	11,415	221	OR	11,636	Theodore Roosevelt	
Grays Lake NWR	6/17/1965	276	Idaho	21,886			21,886	Lyndon B. Johnson	
Kootenai NWR	8/31/1964	270	Idaho	2,774			2,774	Lyndon B. Johnson	
Minidoka NWR	2/25/1909	20	Idaho	24,618			24,618	Theodore Roosevelt	
Oxford Slough WMD	9/30/1985		Idaho	2,052			2,052	na	
Chautauqua NWR	12/23/1936	101	Illinois	6,588			6,588	Franklin D. Roosevelt	RNA, WHSR
Crab Orchard NWR	8/5/1947	215	Illinois	43,976			43,976	Harry S. Truman	RNA, W
Cypress Creek NWR	7/27/1990	454	Illinois	16,514			16,514	George H.W. Bush (Sr.)	R
Emiquon NWR	12/29/1993	491	Illinois	2,559			2,559	Bill Clinton	R
Great River NWR	5/31/2000	522	Illinois	7,971	2,810	MO	10,781	Bill Clinton	RNA
Kankakee NWR	5/25/2016	564	Illinois	66			66	Barack Obama	
Meredosia NWR	10/25/1972	322	Illinois	3,502			3,502	Richard Nixon	
Middle Mississippi R, NWR	5/31/2000	523	Illinois	6,400	1,816	MO	8,216	Franklin D. Roosevelt	
Two Rivers NWR	5/31/2000	525	Illinois	8,033	232	MO	8,265	Harry S. Truman	RNA
Big Oaks NWR	6/30/2000	526	Indiana	51,000			51,000	Bill Clinton	
Muscatatuck NWR	10/6/1966	285	Indiana	7,802			7,802	Lyndon B. Johnson	RNA
Patoka River NWR	9/8/1994	496	Indiana	10,700			10,700	Bill Clinton	
Driftless Area NWR	10/16/1989	449	Iowa	1,233			1,233	George H.W. Bush (Sr.)	
Iowa WMD	9/5/1979		Iowa	27,376			27,376	na	
Neal Smith NWR	4/16/1991	463	Iowa	6,000			6,000	George H.W. Bush (Sr.)	NRT
Port Louisa NWR	5/31/2000	524	Iowa	22,895	1,477	IL	24,372	Bill Clinton	
Union Slough NWR	9/14/1938	130	Iowa	2,916			2,916	Franklin D. Roosevelt	
Flint Hills Legacy Conservation Area	9/28/2011	555	Kansas	10,116			10,116	Barack Obama	

Flint Hills NWR	9/1/1966	284	Kansas	18,463			18,463	Lyndon B. Johnson	
Kirwin NWR	6/17/1954	223	Kansas	10,778			10,778	Dwight D. Eisenhower	RNA
Marais des Cygnes NWR	8/7/1992	476	Kansas	7,446			7,446	George H.W. Bush (Sr.)	
Quivira NWR	10/8/1955	226	Kansas	22,019			22,019	Dwight D. Eisenhower	R, RNA, WHSR
Clarks River NWR	8/19/1998	512	Kentucky	9,428			9,428	Bill Clinton	
Green River NWR	11/22/2019	568	Kentucky	708			708	Donald Trump	
Atchafalaya NWR	8/8/1986	431	Louisiana	15,770			15,770	Ronald Reagan	
Bayou Cocodrie NWR	2/11/1992	469	Louisiana	14,719			14,719	George H.W. Bush (Sr.)	
Bayou Sauvage NWR	4/25/1990	451	Louisiana	27,190			27,190	George H.W. Bush (Sr.)	
Bayou Teche NWR	10/31/2001	537	Louisiana	10,999			10,999	George W. Bush	
Big Branch Marsh NWR	10/13/1994	499	Louisiana	18,629			18,629	Bill Clinton	MPA
Black Bayou Lake NWR	6/16/1997	508	Louisiana	5,326			5,326	Bill Clinton	
Bogue Chitto NWR	3/4/1981	402	Louisiana	29,594	7,170	MS	36,624	Ronald Reagan	
Breton NWR	10/4/1904	2	Louisiana	9,047			9,560	Theodore Roosevelt	MPA, W
Cameron Prairie NWR	12/29/1988	440	Louisiana	24,548			24,548	Ronald Reagan	
Cat Island NWR	5/30/2000	521	Louisiana	10,973			10,973	Bill Clinton	
Catahoula NWR	10/28/1958	233	Louisiana	29,139			29,139	Dwight D. Eisenhower	R
D'Arbonne NWR	5/19/1975	355	Louisiana	17,420			17,420	Gerald Ford	
Delta NWR	11/19/1935	87	Louisiana	48,801			48,801	Franklin D. Roosevelt	MPA
Grand Cote NWR	3/6/1992	472	Louisiana	6,014			6,014	George H.W. Bush (Sr.)	NRT
Handy Brake NWR	11/25/1992	481	Louisiana	466			466	George H.W. Bush (Sr.)	
Lacassine NWR	12/30/1937	116	Louisiana	34,360			34,360	Franklin D. Roosevelt	W
Lake Ophelia NWR	6/30/1988	437	Louisiana	17,561			17,561	Ronald Reagan	
Mandalay NWR	5/2/1996	502	Louisiana	4,620			4,620	Bill Clinton	
Red River NWR	8/22/2002	539	Louisiana	15,513			15,513	George W. Bush	
Sabine NWR	12/6/1937	115	Louisiana	125,790			125,790	Franklin D. Roosevelt	MPA, RNA
Shell Keys NWR	8/17/1907	6	Louisiana	8			8	Theodore Roosevelt	MPA
Tensas River NWR	2/5/1985	419	Louisiana	77,444			77,444	Ronald Reagan	
Upper Ouachita NWR	11/9/1978	369	Louisiana	54,243			54,243	Jimmy Carter	
Aroostook NWR	9/30/1998	513	Maine	5,252			5,252	Bill Clinton	
Carlton Pond WMD	11/24/1965		Maine	1,068			1,068	na	
Cross Island NWR	7/3/1980	383	Maine	1,723			1,723	Jimmy Carter	MPA
Franklin Island NWR	9/19/1973	333	Maine	12			12	Richard Nixon	
Moosehorn NWR	1/13/1937	109	Maine	29,395			29,395	Franklin D. Roosevelt	RNA, W

Petit Manan NWR	7/9/1974	346	Maine	6,767			6,767	Richard Nixon	
Pond Island NWR	3/29/1973	325	Maine	10			10	Richard Nixon	MPA
Rachel Carson NWR	12/21/1966	287	Maine	5,776			5,776	Lyndon B. Johnson	MPA, NRT
Seal Island NWR	7/24/1972	319	Maine	65			65	Richard Nixon	
Sunkhaze Meadows NWR	10/22/1988	439	Maine	11,558			11,558	Ronald Reagan	NRT
Blackwater NWR	1/23/1933	62	Maryland	33,614			33,614	Herbert Hoover	MPA, NM
Eastern Neck NWR	12/27/1962	255	Maryland	2,286			2,286	John F. Kennedy	MPA, RNA
Martin NWR	12/20/1954	224	Maryland	4,423	146	VA	4,569	Dwight D. Eisenhower	MPA
Patuxent Research Refuge	12/16/1936	99	Maryland	12,854			12,854	Franklin D. Roosevelt	RNA
Susquehanna NWR	6/23/1942	195	Maryland	4			4	Franklin D. Roosevelt	MPA
Assabet River NWR	7/8/2001	536	Massachusetts	2,337			2,337	George W. Bush	
Great Meadows NWR	5/3/1944	201	Massachusetts	3,875			3,875	Franklin D. Roosevelt	
Mashpee NWR	9/28/1995	500	Massachusetts	552			552	Bill Clinton	MPA
Massasoit NWR	9/21/1983	410	Massachusetts	209			209	Ronald Reagan	
Monomoy NWR	6/1/1944	202	Massachusetts	7,898			7,898	Franklin D. Roosevelt	MPA, WHSR, W
Nantucket NWR	5/1/1973	327	Massachusetts	24			24	Richard Nixon	
Nomans Land Island NWR	4/29/1970	305	Massachusetts	628			628	Richard Nixon	MPA
Oxbow NWR	5/24/1974	341	Massachusetts	1,698			1,698	Richard Nixon	
Parker River NWR	12/26/1941	191	Massachusetts	4,727			4,727	Franklin D. Roosevelt	MPA, NRT, RNA, WHSR
Thacher Island NWR	7/25/1972	320	Massachusetts	22			22	Richard Nixon	
Detroit River International NWR	12/21/2001	538	Michigan	6,160			6,160	George W. Bush	R
Green Bay NWR	2/21/1912	27	Michigan	1,289	479	WI	1,768	William Howard Taft	W
Harbor Island NWR	12/8/1983	411	Michigan	720			720	Ronald Reagan	
Huron NWR	10/10/1905	5	Michigan	147			147	Theodore Roosevelt	MPA, W
Kirtland's Warbler WMA	9/3/1980	384	Michigan	6,684			6,684	Jimmy Carter	
Michigan Islands NWR	4/10/1947	213	Michigan	705			705	Harry S. Truman	W
Michigan WMD	1/29/1981		Michigan	1,436			1,436	na	
Seney NWR	5/22/1935	73	Michigan	95,265			95,265	Franklin D. Roosevelt	NNL, NRT, RNA, W
Shiawassee NWR	10/21/1953	222	Michigan	9,854			9,854	Dwight D. Eisenhower	NRT
Agassiz NWR	3/23/1937	105	Minnesota	61,501			61,501	Franklin D. Roosevelt	W
Big Stone NWR	5/21/1975	356	Minnesota	11,728			11,728	Gerald Ford	

Big Stone WMD	8/30/1995		Minnesota	6,605			6,605	na	
Crane Meadows NWR	9/10/1993	487	Minnesota	2,207			2,207	Bill Clinton	
Detroit Lakes WMD	4/27/1962		Minnesota	85,030			85,030	na	
Fergus Falls WMD	8/31/1962		Minnesota	87,306			87,306	na	
Glacial Ridge NWR	10/26/2004	545	Minnesota	23,2488			23,248	George W. Bush	
Hamden Slough NWR	9/19/1989	446	Minnesota	3,223			3,223	Ronald Reagan	
Litchfield WMD	11/21/1963		Minnesota	49,814			49,814	na	
Mille Lacs NWR	5/14/1915	32	Minnesota	0.6			0.6	Woodrow Wilson	
Minnesota Valley NWR	10/8/1976	361	Minnesota	11,547			11,547	Gerald Ford	
Minnesota Valley WMD	8/26/1991		Minnesota	9,123			9,123	na	
Morris WMD	8/13/1962		Minnesota	97,367			97,367	na	NRT
N.Tallgrass Prairie NWR	9/18/2000	528	Minnesota	13,334	761	IA	14,095	Bill Clinton	
Rice Lake NWR	10/31/1935	86	Minnesota	14,427			14,427	Franklin D. Roosevelt	RNA
Rydell NWR	1/31/1992	468	Minnesota	2,070			2,070	George H.W. Bush (Sr.)	NRT
Sherburne NWR	9/8/1965	278	Minnesota	29,678			29,678	Lyndon B. Johnson	NRT, RNA
Tamarac NWR	5/31/1938	121	Minnesota	35,235			35,235	Franklin D. Roosevelt	RNA, W
Tamarac WMD	11/16/1994		Minnesota	4,381			4,381	na	
Windom WMD	10/21/1964		Minnesota	19,977			19,977	na	
Coldwater River NWR	1/30/2001	534	Mississippi	2,482			2,482	George W. Bush	
Dahomey NWR	2/11/1991	459	Mississippi	9,167			9,167	George H.W. Bush (Sr.)	
Grand Bay NWR	9/22/1992	478	Mississippi	7,546	2,718	AL	10,264	George H.W. Bush (Sr.)	MPA
Hillside NWR	4/14/1975	352	Mississippi	15,699			15,699	Gerald Ford	
Holt Collier NWR	1/23/2004	543	Mississippi	2,937			2,937	George W. Bush	
Matthews Brake NWR	9/3/1980	385	Mississippi	2,415			2,415	Jimmy Carter	
Mississippi Sandhill Crane NWR	11/25/1975	358	Mississippi	19,836			19,836	Gerald Ford	
Morgan Brake NWR	9/29/1977	364	Mississippi	7,464			7,464	Jimmy Carter	
Panther Swamp NWR	1/11/1978	366	Mississippi	40,649			40,649	Jimmy Carter	
Sam Hamilton Noxubee NWR	6/14/1940	171	Mississippi	47,373			47,373	Franklin D. Roosevelt	RNA
St. Catherine Creek NWR	1/16/1990	450	Mississippi	25,091			25,091	George H.W. Bush (Sr.)	NRT
Tallahatchie NWR	3/5/1991	460	Mississippi	4,588			4,588	George H.W. Bush (Sr.)	
Theodore Roosevelt NWR	1/23/2004	544	Mississippi	6,352			6,352	George W. Bush	
Yazoo NWR	12/7/1936	97	Mississippi	12,943			12,943	Franklin D. Roosevelt	RNA
Big Muddy NFWR	9/9/1994	497	Missouri	18,336			18,336	Bill Clinton	
Clarence Cannon NWR	8/11/1964	267	Missouri	3,750			3,750	Lyndon B. Johnson	
Loess Bluffs NWR	8/23/1935	76	Missouri	7,415			7,415	Franklin D. Roosevelt	RNA, WHSR

Mingo NWR	6/7/1944	203	Missouri	21,659			21,659	Franklin D. Roosevelt	NRT RNA, W
Ozark Cavefish NWR	10/22/1991	465	Missouri	42			42	George H.W. Bush (Sr.)	
Pilot Knob NWR	7/17/1987	435	Missouri	90			90	Ronald Reagan	
Swan Lake NWR	2/27/1937	103	Missouri	11,493			11,493	Franklin D. Roosevelt	RNA, WHSR
Benton Lake NWR	11/21/1929	49	Montana	12,459			12,459	Herbert Hoover	NRT, RNA, WHSR
Benton Lake WMD	10/7/1974		Montana	121,399			121,399	na	
Black Coulee NWR	1/28/1938	118	Montana	1,309			1,309	Franklin D. Roosevelt	
Blackfoot Valley Conservation Area	2/3/1997	507	Montana	62,970			62,970	Bill Clinton	
Bowdoin NWR	2/14/1936	89	Montana	15,552			15,552	Franklin D. Roosevelt	NRT, WHSR
Bowdoin WMD	4/14/1977		Montana	185,931			185,931	na	
Charles M. Russell NWR	12/11/1936	98	Montana	936,257			936,257	Franklin D. Roosevelt	NNL, RNA
Charles M. Russell WMD	10/18/1979		Montana	3,968			3,968	na	
Creedman Coulee NWR	10/25/1941	188	Montana	2,728			2,728	Franklin D. Roosevelt	
Grass Lake NWR	5/19/1942	193	Montana	4,318			4,318	Franklin D. Roosevelt	
Hailstone NWR	12/31/1942	196	Montana	920			920	Franklin D. Roosevelt	
Hewitt Lake NWR	3/7/1938	119	Montana	1,361			1,361	Franklin D. Roosevelt	
Lake Mason NWR	6/3/1941	185	Montana	16,815			16,815	Franklin D. Roosevelt	RNA
Lake Thibadeau NWR	9/23/1937	111	Montana	3,868			3,868	Franklin D. Roosevelt	
Lamesteer NWR	5/19/1942	194	Montana	800			800	Franklin D. Roosevelt	
Lee Metcalf NWR	2/4/1964	263	Montana	2,800			2,800	Lyndon B. Johnson	NRT
Lost Trail NWR	8/24/1999	517	Montana	8,905			8,905	Bill Clinton	
Lost Trail Conservation Area	7/13/2022	568	Montana	38,052			38,052	Joseph R. Biden	
Medicine Lake NWR	3/29/1935	70	Montana	31,534			31,534	Franklin D. Roosevelt	NNL, RNA, W
NE Montana WMD	5/28/1968		Montana	36,476			36,476	na	
Nine-Pipe NWR	6/25/1921	36	Montana	4,028			4,028	Warren G. Harding	
NW Montana-Flathead WMD	12/17/1970		Montana	5,806			5,806	na	
NW Montana-Lake WMD	11/1/1974		Montana	7,884			7,884	na	
Pablo NWR	6/25/1921	37	Montana	2,474			2,474	Warren G. Harding	
Red Rock Lakes NWR	4/22/1935	71	Montana	84,870			84,870	Franklin D. Roosevelt	NNL, RNA, W

Rocky Mountain Front Conservation Area	9/19/2006	547	Montana	101,287			101,287	George W. Bush	
Swan River NWR	5/14/1973	328	Montana	1,961			1,961	Richard Nixon	
Swan Valley Cons. Area	8/6/2012	557	Montana	80			80	Barack Obama	
UL Bend NWR	10/30/1967	290	Montana	56,090			56,090	Lyndon B. Johnson	W
War Horse NWR	11/6/1958	235	Montana	3,393			3,393	Dwight D. Eisenhower	
Boyer Chute NWR	9/30/1997	509	Nebraska	4,040			4,040	Bill Clinton	NRT
Crescent Lake NWR	3/16/1931	56	Nebraska	45,995			45,995	Herbert Hoover	RNA
Desoto NWR	12/13/1958	237	Nebraska	4,324	3,503	IA	7,827	Dwight D. Eisenhower	RNA
Fort Niobrara NWR	1/11/1912	26	Nebraska	19,133			19,133	William Howard Taft	NRT, RNA, WSR, W
John & Loise Seier NWR	10/26/1999	519	Nebraska	2,400			2,400	Bill Clinton	
North Platte NWR	8/21/1916	34	Nebraska	3,473			3,473	Woodrow Wilson	
Rainwater Basin WMD	2/28/1963		Nebraska	27,525			27,525	na	NRT
Valentine NWR	8/14/1935	74	Nebraska	73,098			73,098	Franklin D. Roosevelt	
Anaho Island NWR	9/4/1913	30	Nevada	248			248	Woodrow Wilson	RNA
Ash Meadows NWR	6/13/1984	414	Nevada	23,794			23,794	Ronald Reagan	R
Desert NWR	5/20/1936	92	Nevada	1,615,386			1,615,386	Franklin D. Roosevelt	RNA
Fallon NWR	4/22/1931	57	Nevada	17,902			17,902	Herbert Hoover	
Moapa Valley NWR	9/10/1979	378	Nevada	136			136	Jimmy Carter	
Pahranagat NWR	8/6/1963	258	Nevada	4,997			4,997	John F. Kennedy	
Ruby Lake NWR	7/2/1938	123	Nevada	40,046			40,046	Franklin D. Roosevelt	NNL, RNA
Sheldon NWR	1/26/1931	54	Nevada	573,026	627	OR	573,653	Herbert Hoover	
Stillwater NWR	11/26/1948	216	Nevada	81,851			81,851	Harry S. Truman	WHSR
Great Bay NWR	8/11/1992	477	New Hampshire	1,116			1,116	George H.W. Bush (Sr.)	MPA
John Hay NWR	3/19/1987	434	New Hampshire	81			81	Ronald Reagan	
Umbagog NWR	11/17/1992	480	New Hampshire	24,863	12,203	ME	37,066	George H.W. Bush (Sr.)	
Wapack NWR	5/17/1972	316	New Hampshire	1,647			1,647	Richard Nixon	
Cape May NWR	6/27/1989	444	New Jersey	12,673			12,673	George H.W. Bush (Sr.)	MPA, WHSR
Edwin B. Forsythe NWR	10/5/1939	167	New Jersey	50,461			50,461	Franklin D. Roosevelt	MPA, R, RNA, WHSR, W
Great Swamp NWR	11/3/1960	240	New Jersey	7,867			7,867	Dwight D. Eisenhower	NNL, RNA, W
Supawna Meadows NWR	9/23/1973	334	New Jersey	3,702			3,702	Richard Nixon	MPA

Wallkill River NWR	2/16/1992	470	New Jersey	5,655	308	NY	5,963	George H.W. Bush (Sr.)	
Bitter Lake NWR	10/8/1937	113	New Mexico	24,609			24,609	Franklin D. Roosevelt	NNL, R, RNA, W
Bosque Del Apache NWR	11/22/1939	169	New Mexico	57,331			57,331	Franklin D. Roosevelt	RNA, W
Gruila NWR	11/6/1969	304	New Mexico	3,231	5	TX	3,236	Richard Nixon	NRT
Las Vegas NWR	4/25/1966	282	New Mexico	8,672			8,672	Lyndon B. Johnson	RNA
Maxwell NWR	4/26/1966	283	New Mexico	3,699			3,699	Lyndon B. Johnson	RNA
Rio Mora NWR	9/27/2012	560	New Mexico	4,224			4,224	Barack Obama	
San Andres NWR	1/22/1941	173	New Mexico	57,215			57,215	Franklin D. Roosevelt	
Sevilleta NWR	12/28/1973	337	New Mexico	229,674			229,674	Richard Nixon	
Valle de Oro NWR	9/21/2012	559	New Mexico	570			570	Barack Obama	
Amagansett NWR	12/16/1968	297	New York	36			36	Lyndon B. Johnson	
Conscience Point NWR	7/20/1971	310	New York	60			60	Richard Nixon	MPA
Elizabeth A. Morton NWR	12/27/1954	225	New York	187			187	Dwight D. Eisenhower	
Great Thicket NWR	12/14/2016	566	New York	144	144	48-ME, 180-CT	372	Barack Obama	
Iroquois NWR	5/19/1958	231	New York	10,828			10,828	Dwight D. Eisenhower	NNL, RNA
Montezuma NWR	9/12/1938	129	New York	10,150			10,150	Franklin D. Roosevelt	NNL, RNA
Oyster Bay NWR	12/18/1968	298	New York	3,362			3,362	Lyndon B. Johnson	MPA
Seatuck NWR	9/26/1968	295	New York	209			209	Lyndon B. Johnson	MPA
Shawangunk Grasslands NWR	7/27/1999	516	New York	598			598	Bill Clinton	
Target Rock NWR	12/15/1967	291	New York	80			80	Lyndon B. Johnson	MPA
Wertheim NWR	6/7/1947	214	New York	2,688			2,688	Harry S. Truman	MPA
Alligator River NWR	3/14/1984	413	North Carolina	158,749			158,749	Ronald Reagan	MPA
Cedar Island NWR	8/18/1964	268	North Carolina	14,496			14,496	Lyndon B. Johnson	RNA
Currituck NWR	8/29/1984	416	North Carolina	7,700			7,700	Ronald Reagan	MPA
Mackay Island NWR	12/30/1960	247	North Carolina	7,769	882	VA	8,651	Dwight D. Eisenhower	MPA
Mattamuskeet NWR	12/18/1934	63	North Carolina	50,174			50,174	Franklin D. Roosevelt	NNL, RNA
Mountain Bogs NWR	4/20/2015	563	North Carolina	1,624			1,624	Barack Obama	
Pea Island NWR	8/8/1938	126	North Carolina	5,834			5,834	Franklin D. Roosevelt	MPA
Pee Dee NWR	5/13/1964	266	North Carolina	8,467			8,467	Lyndon B. Johnson	
Pocosin Lakes NWR	6/26/1990	453	North Carolina	110,107			110,107	George H.W. Bush (Sr.)	NRT
Roanoke River NWR	9/27/1990	457	North Carolina	20,562			20,562	George H.W. Bush (Sr.)	
Swanquarter NWR	6/23/1932	61	North Carolina	16,411			16,411	Herbert Hoover	MPA, W
Appert Lake NWR	5/10/1939	138	North Dakota	908			908	Franklin D. Roosevelt	
Ardoch NWR	8/25/1936	95	North Dakota	2,696			2,696	Franklin D. Roosevelt	

Arrowwood NWR	3/11/1935	68	North Dakota	15,943			15,943	Franklin D. Roosevelt	NRT
Arrowwood WMD	9/7/1961		North Dakota	36,117			36,117	na	NRT
Audubon NWR	5/25/1956	228	North Dakota	14,739			14,739	Dwight D. Eisenhower	
Audubon WMD	4/4/1962		North Dakota	217,343			217,343	na	
Bone Hill NWR	5/10/1939	139	North Dakota	640			640	Franklin D. Roosevelt	
Brumba NWR	6/12/1939	151	North Dakota	1,977			1,977	Franklin D. Roosevelt	
Buffalo Lake NWR	5/10/1939	140	North Dakota	1,564			1,564	Franklin D. Roosevelt	
Camp Lake NWR	5/10/1939	141	North Dakota	585			585	Franklin D. Roosevelt	
Canfield Lake NWR	5/10/1939	142	North Dakota	313			313	Franklin D. Roosevelt	
Chase Lake NWR	8/28/1908	14	North Dakota	4,449			4,449	Theodore Roosevelt	W
Chase Lake Prairie WMD	10/24/1960		North Dakota	172,155			172,155	na	
Cottonwood Lake NWR	6/12/1939	152	North Dakota	1,013			1,013	Franklin D. Roosevelt	
Crosby WMD	8/14/1962		North Dakota	128,037			128,037	na	
Dakota Grassland Conservation Area	9/21/2011	554	North Dakota	87,820	15,457	SD	103,277	Barack Obama	
Dakota Lake NWR	5/10/1939	143	North Dakota	2,780			2,780	Franklin D. Roosevelt	
Des Lacs NWR	8/22/1935	75	North Dakota	19,547			19,547	Franklin D. Roosevelt	NRT
Devil's Lake WMD	3/15/1961		North Dakota	236,341			236,341	na	
Florence Lake NWR	5/10/1939	144	North Dakota	1,888			1,888	Franklin D. Roosevelt	
Half-way Lake NWR	5/10/1939	145	North Dakota	160			160	Franklin D. Roosevelt	
Hiddenwood NWR	6/12/1939	153	North Dakota	568			568	Franklin D. Roosevelt	
Hobart Lake NWR	6/12/1939	154	North Dakota	2,077			2,077	Franklin D. Roosevelt	
Hutchinson Lake NWR	5/10/1939	146	North Dakota	479			479	Franklin D. Roosevelt	
J. Clark Salyer NWR	9/4/1935	80	North Dakota	59,392			59,392	Franklin D. Roosevelt	NRT, WHSR
J. Clark Salyer WMD	8/14/1962		North Dakota	221,615			221,615	na	
Johnson Lake NWR	5/10/1939	147	North Dakota	2,008			2,008	Franklin D. Roosevelt	
Kellys Slough NWR	3/19/1936	90	North Dakota	1,270			1,270	Franklin D. Roosevelt	WHSR
Kulm WMD	5/5/1960		North Dakota	267,306			267,306	na	
Lake Alice NWR	3/14/1940	170	North Dakota	12,096			12,096	Franklin D. Roosevelt	
Lake George NWR	6/12/1939	155	North Dakota	3,119			3,119	Franklin D. Roosevelt	
Lake Ilo NWR	6/12/1939	156	North Dakota	4,033			4,033	Franklin D. Roosevelt	
Lake Nettie NWR	6/12/1939	157	North Dakota	3,055			3,055	Franklin D. Roosevelt	
Lake Otis NWR	3/6/1935	66	North Dakota	320			320	Franklin D. Roosevelt	
Lake Patricia NWR	6/12/1939	158	North Dakota	800			800	Franklin D. Roosevelt	
Lake Zahl NWR	6/12/1939	159	North Dakota	3,823			3,823	Franklin D. Roosevelt	

Lambs Lake NWR	6/12/1939	160	North Dakota	1,207		1,207	Franklin D. Roosevelt	
Little Goose NWR	5/10/1939	148	North Dakota	288		288	Franklin D. Roosevelt	
Long Lake NWR	2/25/1932	60	North Dakota	22,499		22,499	Herbert Hoover	WHSR
Long Lake WMD	3/7/1961		North Dakota	248,682		248,682	na	
Lords Lake NWR	5/10/1939	149	North Dakota	1,915		1,915	Franklin D. Roosevelt	
Lost Lake NWR	5/10/1939	150	North Dakota	960		960	Franklin D. Roosevelt	
Lostwood NWR	3/26/1935	81	North Dakota	27,589		27,589	Franklin D. Roosevelt	NRT
Lostwood WMD	8/14/1962		North Dakota	85,289		85,289	na	W
Maple River NWR	6/12/1939	161	North Dakota	712		712	Franklin D. Roosevelt	
McLean NWR	6/12/1939	162	North Dakota	760		760	Franklin D. Roosevelt	
N. Dakota WMA	2/25/2000	520	North Dakota	48,793		48,793	Bill Clinton	
Pleasant Lake NWR	6/12/1939	163	North Dakota	898		898	Franklin D. Roosevelt	
Pretty Rock NWR	2/3/1941	175	North Dakota	800		800	Franklin D. Roosevelt	
Raab Lake NWR	9/23/1937	112	North Dakota	261		261	Franklin D. Roosevelt	
Rock Lake NWR	6/12/1939	164	North Dakota	5,666		5,666	Franklin D. Roosevelt	
Rose Lake NWR	9/9/1935	83	North Dakota	836		836	Franklin D. Roosevelt	
School Section Lake NWR	9/11/1935	84	North Dakota	297		297	Franklin D. Roosevelt	
Shell Lake NWR	6/12/1939	165	North Dakota	1,835		1,835	Franklin D. Roosevelt	
Shenandoah Lake NWR	3/8/1935	67	North Dakota	797		797	Franklin D. Roosevelt	
Sibley Lake NWR	6/12/1939	166	North Dakota	1,077		1,077	Franklin D. Roosevelt	
Silver Lake NWR	4/9/1937	107	North Dakota	3,348		3,348	Franklin D. Roosevelt	
Slade NWR	10/10/1944	205	North Dakota	3,000		3,000	Franklin D. Roosevelt	
Snyder Lake NWR	2/3/1941	176	North Dakota	1,550		1,550	Franklin D. Roosevelt	
Springwater NWR	2/3/1941	177	North Dakota	640		640	Franklin D. Roosevelt	
Stewart Lake NWR	10/27/1939	168	North Dakota	2,230		2,230	Franklin D. Roosevelt	
Stoney Slough NWR	2/3/1941	178	North Dakota	880		880	Franklin D. Roosevelt	
Storm Lake NWR	8/4/1936	93	North Dakota	686		686	Franklin D. Roosevelt	
Stump Lake NWR	3/9/1905	3	North Dakota	27		27	Theodore Roosevelt	
Sunburst Lake NWR	2/3/1941	179	North Dakota	328		328	Franklin D. Roosevelt	
Tewaukon NWR	6/26/1945	207	North Dakota	8,364		8,364	Franklin D. Roosevelt	
Tewaukon WMD	8/17/1961		North Dakota	75,744		75,744	na	
Tomahawk NWR	2/3/1941	180	North Dakota	440		440	Franklin D. Roosevelt	
Upper Souris NWR	8/27/1935	79	North Dakota	32,302		32,302	Franklin D. Roosevelt	
Valley City WMD	10/21/1960		North Dakota	80,768		80,768	na	
White Horse Hill NWR	12/22/1921	38	North Dakota	1,675		1,675	Warren G. Harding	NRT
White Lake NWR	2/3/1941	181	North Dakota	1,040		1,040	Franklin D. Roosevelt	

Wild Rice Lake NWR	9/20/1936	96	North Dakota	779			779	Franklin D. Roosevelt	
Willow Lake NWR	2/3/1941	182	North Dakota	2,620			2,620	Franklin D. Roosevelt	
Wintering River NWR	2/3/1941	183	North Dakota	239			239	Franklin D. Roosevelt	
Wood Lake NWR	4/20/1936	91	North Dakota	280			280	Franklin D. Roosevelt	
Cedar Point NWR	12/18/1964	273	Ohio	2,450			2,450	Lyndon B. Johnson	
Ottawa NWR	7/28/1961	250	Ohio	8,057			8,057	John F. Kennedy	NRT, WSR
West Sister Island NWR	8/2/1938	125	Ohio	80			80	Franklin D. Roosevelt	RNA W
Deep Fork NWR	6/30/1993	486	Oklahoma	10,337			10,337	Bill Clinton	
Little River NWR	2/10/1987	433	Oklahoma	14,216			14,216	Ronald Reagan	
Optima NWR	3/24/1975	351	Oklahoma	4,333			4,333	Gerald Ford	
Ozark Plateau NWR	9/26/1985	427	Oklahoma	4,512			4,512	Ronald Reagan	
Salt Plains NWR	3/26/1930	50	Oklahoma	32,197			32,197	Herbert Hoover	NNL, NRT, WWSR
Sequoyah NWR	12/11/1970	308	Oklahoma	20,800			20,800	Richard Nixon	NRT
Tishomingo NWR	1/24/1946	210	Oklahoma	16,464			16,464	Harry S. Truman	
Washita NWR	4/15/1961	249	Oklahoma	8,075			8,075	John F. Kennedy	NRT
Wichita Mountains NWR	3/5/1935	65	Oklahoma	59,020			59,020	Franklin D. Roosevelt	NRT, RNA, W
Ankeny NWR	1/18/1965	274	Oregon	3,025			3,025	Lyndon B. Johnson	NRT
Bandon Marsh NWR	2/14/1983	407	Oregon	865			865	Ronald Reagan	MPA
Baskett Slough NWR	10/22/1965	279	Oregon	2,643			2,643	Lyndon B. Johnson	NRT
Bear Valley NWR	5/31/1978	367	Oregon	4,200			4,200	Jimmy Carter	
Cape Meares NWR	8/19/1938	128	Oregon	139			139	Franklin D. Roosevelt	RNA
Cold Springs NWR	2/25/1909	21	Oregon	3,117			3,117	Theodore Roosevelt	
Hart Mountain National Antelope Refuge	12/20/1936	100	Oregon	271,247			271,247	Franklin D. Roosevelt	RNA
Julia Butler Hansen NWR	12/17/1971	313	Oregon	3,167	2,889	WA	6,056	Richard Nixon	RNA, WWSR
Klamath Marsh NWR	6/12/1958	232	Oregon	43,662			43,662	Dwight D. Eisenhower	
Lewis And Clark NWR	4/19/1972	314	Oregon	12,086			12,086	Richard Nixon	MPA, WWSR
Malheur NWR	8/18/1908	13	Oregon	187,167			187,167	Theodore Roosevelt	RNA
Mckay Creek NWR	6/7/1927	43	Oregon	1,837			1,837	Calvin Coolidge	
Nestucca Bay NWR	3/21/1991	461	Oregon	1,198			1,198	George H.W. Bush (Sr.)	MPA
Oregon Islands NWR	5/6/1935	72	Oregon	759			759	Franklin D. Roosevelt	W
Siletz Bay NWR	10/23/1991	467	Oregon	572			572	George H.W. Bush (Sr.)	MPA
Three Arch Rocks NWR	10/14/1907	7	Oregon	15			15	Harry S. Truman	W

Tualatin River NWR	12/31/1992	483	Oregon	1,404			1,404	George H.W. Bush (Sr.)	
Upper Klamath NWR	4/3/1928	44	Oregon	27,422			27,422	Calvin Coolidge	
Wapato Lake NWR	12/3/2013	562	Oregon	944			944	Barack Obama	
William L. Finley NWR	4/3/1964	264	Oregon	5,706			5,706	Lyndon B. Johnson	NRT, RNA
Guam NWR	10/1/1993	489	Pacific - Guam	23,674			23,674	Bill Clinton	MPA
Mariana Trench MNM Includes: Mariana Arc of Fire NWR Mariana Trench NWR Other than NWRSA	1/6/2009 [1/6/2009] [1/6/2009] [1/6/2009]	[549] [550] [na]	Pacific - Mariana Trench MNM	61,077,668			61,077,668 [46,780] [50,532,102] [10,498,787]	George W. Bush	MPA, NM
Rose Atoll MNM Includes: Rose Atoll NWR Other than NWRSA	1/6/2009 [8/24/1973] [1/6/2009]	[332] [na]	Pacific - Rose Atoll MNM	8,609,045			8,609,045 [1,613] [8,607,432]	George W. Bush [Richard Nixon] [George W. Bush]	MPA, NM
Pacific Remote Islands MNM Includes: Baker Island NWR Howland Island NWR Jarvis Island NWR Johnston Atoll NWR Kingman Reef NWR Palmyra Atoll NWR Wake Atoll NWR Other NWRS managed	1/6/2009 [6/27/1974] [6/27/1974] [6/27/1974] [6/29/1926] [1/18/2001] [1/18/2001] [1/6/2009] [1/6/2009]	[342] [343] [344] [41] [532] [533] [551] [na]	Pacific - Pacific Remote Islands MNM	313,941,851			313,941,851 [413,416] [422,361] [434,697] [567,289] [487,016] [533,110] [497,750] [310,586,212]	George W. Bush [Richard Nixon] [Richard Nixon] [Richard Nixon] [Calvin Coolidge] [Bill Clinton] [Bill Clinton] [George W. Bush] [GW Bush and Obama]	MPA, NM
Papahānaumokuākea MNM Includes: Hawaiian Islands NWR Midway Atoll NWR Other NWRS managed	6/15/2006 [2/3/1909] [10/31/1996] [6/15/2006]	[18] [504] [na]	Pacific - Papahānaumokuākea MNM	372,848,597			372,848,597 [254,418] [580,740] [372,013,439]	Barack Obama [Theodore Roosevelt] [Bill Clinton] [GW Bush & Obama]	MPA, NM, RNA, WHS
Cherry Valley NWR	10/18/2010	553	Pennsylvania	5,547			5,547	Barack Obama	RNA
Erie NWR	5/22/1959	239	Pennsylvania	8,959			8,959	Dwight D. Eisenhower	NNL, NRT
John Heinz NWR, Tinicum	6/30/1972	317	Pennsylvania	993			993	Richard Nixon	MPA
Block Island NWR	11/1/1973	335	Rhode Island	133			133	Richard Nixon	MPA
John H. Chaffee NWR	6/26/1989	443	Rhode Island	550			550	George H.W. Bush (Sr.)	MPA
Ninigret NWR	8/12/1970	306	Rhode Island	871			871	Richard Nixon	MPA
Sachuest Point NWR	11/3/1970	307	Rhode Island	242			242	Richard Nixon	
Trustom Pond NWR	8/15/1974	348	Rhode Island	782			782	Richard Nixon	MPA, NRT, RNA, WHSR, W
Cape Romain NWR	4/3/1930	51	South Carolina	66,327			66,327	Herbert Hoover	RNA

Carolina Sandhills NWR	3/17/1939	135	South Carolina	45,951			45,951	Franklin D. Roosevelt	RNA
Ernest F. Hollings Ace Basin NWR	9/21/1990	456	South Carolina	11,890			11,890	George H.W. Bush (Sr.)	MPA
Pinckney Island NWR	12/4/1975	359	South Carolina	4,053			4,053	Gerald Ford	MPA
Santee NWR	1/1/1942	192	South Carolina	12,306			12,306	Franklin D. Roosevelt	
Tybee NWR	5/9/1938	120	South Carolina	100			100	Franklin D. Roosevelt	MPA
Waccamaw NWR	12/1/1997	511	South Carolina	35,318			35,318	Bill Clinton	MPA
Bear Butte NWR	8/26/1935	78	South Dakota	374			374	Franklin D. Roosevelt	
Dak. Tallgrass Prairie WMA	12/19/2000	530	South Dakota	71,451	6,215	ND	77,666	Bill Clinton	
Huron WMD	5/5/1961		South Dakota	416,016			416,016	na	
Karl E. Mundt NWR	4/17/1975	353	South Dakota	1,044	19	NE	1,063	Gerald Ford	
Lacreek NWR	8/26/1935	77	South Dakota	17,015			17,015	Franklin D. Roosevelt	
Lacreek WMD	5/26/1993		South Dakota	3,458			3,458	na	
Lake Andes NWR	2/6/1935	64	South Dakota	5,639			5,639	Franklin D. Roosevelt	
Lake Andes WMD	12/12/1963		South Dakota	166,383			166,383	na	
Madison WMD	5/5/1961		South Dakota	192,136			192,136	na	
Sand Lake NWR	3/23/1935	69	South Dakota	21,820			21,820	Franklin D. Roosevelt	NRT, R
Sand Lake WMD	5/5/1961		South Dakota	785,155			785,155	na	
Waubay NWR	12/10/1935	88	South Dakota	4,740			4,740	Franklin D. Roosevelt	RNA
Waubay WMD	1/19/1959		South Dakota	319,650			319,650	na	
Chickasaw NWR	8/5/1985	424	Tennessee	26,815			26,815	Ronald Reagan	NRT
Cross Creeks NWR	11/9/1962	254	Tennessee	8,861			8,861	John F. Kennedy	
Hatchie NWR	11/16/1964	272	Tennessee	11,556			11,556	Lyndon B. Johnson	
Lake Isom NWR	8/12/1938	127	Tennessee	1,858			1,858	Franklin D. Roosevelt	
Lower Hatchie NWR	6/19/1980	382	Tennessee	12,087			12,087	Jimmy Carter	
Reelfoot NWR	8/28/1941	187	Tennessee	8,411	2,040	KY	10,451	Franklin D. Roosevelt	
Tennessee NWR	12/28/1945	209	Tennessee	51,359			51,359	Harry S. Truman	RNA
Anahuac NWR	2/27/1963	256	Texas	39,219			39,219	John F. Kennedy	MPA, NRT, RNA, WHSR
Aransas NWR	12/31/1937	117	Texas	115,324			115,324	Franklin D. Roosevelt	MPA
Attwater Prairie Chicken NWR	7/1/1972	318	Texas	10,541			10,541	Richard Nixon	NNL
Balcones Canyonlands NWR	2/25/1992	471	Texas	27,321			27,321	George H.W. Bush (Sr.)	NRT
Big Boggy NWR	7/8/1983	408	Texas	4,526			4,526	Ronald Reagan	MPA, WHSR

Brazoria NWR	10/17/1966	286	Texas	45,764			45,764	Lyndon B. Johnson	MPA, RNA, WHSR
Buffalo Lake NWR	11/6/1958	236	Texas	7,664			7,664	Dwight D. Eisenhower	NNL, RNA
Caddo Lake NWR	10/19/2000	529	Texas	8,414			8,414	Bill Clinton	R
Hagerman NWR	2/9/1946	211	Texas	11,320			11,320	Harry S. Truman	RNA
Laguna Atascosa NWR	3/29/1946	212	Texas	99,017			99,017	Harry S. Truman	NNL, RNA, WHSR
Little Sandy NWR	12/18/1986	432	Texas	3,802			3,802	Ronald Reagan	
Lower Rio Grande Valley	2/12/1979	371	Texas	106,255			106,255	Jimmy Carter	
McFaddin NWR	1/2/1980	379	Texas	67,473			67,473	Jimmy Carter	
Moody NWR	11/9/1961	251	Texas	3,517			3,517	Ronald Reagan	
Muleshoe NWR	10/24/1935	85	Texas	6,449			6,449	Franklin D. Roosevelt	NNL
Neches River NWR	8/23/2006	546	Texas	7,483			7,483	George W. Bush	
San Bernard NWR	11/7/1968	296	Texas	69,327			69,327	Lyndon B. Johnson	MPA, WHSR
Santa Ana NWR	9/1/1943	199	Texas	2,088			2,088	Franklin D. Roosevelt	NNL, RNA
Texas Point NWR	7/26/1979	376	Texas	8,963			8,963	Jimmy Carter	
Trinity River NWR	1/4/1994	492	Texas	29,200			29,200	Bill Clinton	
Bear River Migratory Bird Refuge	5/14/1929	47	Utah	77,102			77,102	Herbert Hoover	NRT, RNA, WHSR
Bear River Watershed NWR	6/28/2016	565	Utah	4,861	2,466	WY	7,327	Barack Obama	
Colorado River WMA	6/14/1999	515	Utah	1,008	339	CO	1,347	Bill Clinton	
Fish Springs NWR	3/10/1959	238	Utah	17,992			17,992	Dwight D. Eisenhower	
Ouray NWR	11/22/1960	243	Utah	11,833			11,833	Dwight D. Eisenhower	
Missisquoi NWR	2/4/1943	197	Vermont	7,251			7,251	Franklin D. Roosevelt	R, RNA
Silvio O. Conte NWR	10/3/1997	510	Vermont	26,887	12,966	CT-1458, MA-1497, NH-10011	39,853	Bill Clinton	NRT
Back Bay NWR	6/6/1938	122	Virginia	9,176			9,176	Franklin D. Roosevelt	MPA
Chincoteague NWR	5/13/1943	198	Virginia	13,615	418	MD	14,033	Franklin D. Roosevelt	MPA, RNA, WHSR
Eastern Shore of VA NWR	8/6/1984	415	Virginia	1,443			1,443	Ronald Reagan	MPA, WHSR
Elizabeth Hartwell Mason Neck NWR	2/1/1969	301	Virginia	2,277			2,277	Richard Nixon	
Featherstone NWR	12/29/1978	370	Virginia	326			326	Jimmy Carter	MPA
Fisherman Island NWR	1/17/1969	300	Virginia	1,896			1,896	Lyndon B. Johnson	MPA, WHSR

Great Dismal Swamp NWR	2/22/1973	324	Virginia	86,091	27,602	NC	113,693	Richard Nixon	NNL
James River NWR	3/27/1991	462	Virginia	4,700			4,700	George H.W. Bush (Sr.)	
Nansemond NWR	12/20/1973	336	Virginia	423			423	Richard Nixon	
Occoquan Bay NWR	6/29/1973	331	Virginia	642			642	Richard Nixon	MPA
Plum Tree Island NWR	4/24/1972	315	Virginia	3,502			3,502	Richard Nixon	MPA
Presqu'île NWR	3/11/1953	221	Virginia	1,329			1,329	Dwight D. Eisenhower	
Rappahannock River Valley NWR	5/28/1996	503	Virginia	10,047			10,047	Bill Clinton	
Wallops Island NWR	3/11/1971	309	Virginia	373			373	Richard Nixon	MPA, WHSR
Billy Frank Jr. Nisqually NWR	2/21/1974	339	Washington	5,971			5,971	Richard Nixon	MPA, RNA
Columbia NWR	6/13/1944	204	Washington	28,554			28,554	Franklin D. Roosevelt	RNA
Conboy Lake NWR	4/14/1965	275	Washington	7,114			7,114	Lyndon B. Johnson	
Copalis NWR	10/23/1907	8	Washington	61			61	Theodore Roosevelt	W
Dungeness NWR	1/20/1915	31	Washington	773			773	Woodrow Wilson	MPA, RNA
Flattery Rocks NWR	10/23/1907	9	Washington	125			125	Theodore Roosevelt	W
Franz Lake NWR	5/22/1990	452	Washington	550			550	George H.W. Bush (Sr.)	
Grays Harbor NWR	8/29/1990	455	Washington	1,471			1,471	George H.W. Bush (Sr.)	MPA, WHSR
Little Pend Oreille NWR	5/2/1939	137	Washington	42,658			42,658	Franklin D. Roosevelt	RNA
Mcnary NWR	12/29/1955	227	Washington	14,666	1,185	OR	15,851	Dwight D. Eisenhower	
Pierce NWR	12/31/1983	412	Washington	329			329	Ronald Reagan	
Protection Island NWR	12/22/1982	405	Washington	319			319	Ronald Reagan	MPA
Quillayute Needles NWR	10/23/1907	10	Washington	300			300	Theodore Roosevelt	W
Ridgefield NWR	1/27/1966	281	Washington	5,231			5,231	Lyndon B. Johnson	NRT, RNA
Saddle Mountain NWR	11/30/1971	312	Washington	161,486			161,486	Richard Nixon	NM
San Juan Islands NWR	12/24/1960	246	Washington	449			449	Dwight D. Eisenhower	W
Steigerwald Lake NWR	3/27/1986	429	Washington	1,300			1,300	Ronald Reagan	
Toppenish NWR	4/27/1964	265	Washington	1,979			1,979	Lyndon B. Johnson	
Turnbull NWR	7/30/1937	110	Washington	21,387			21,387	Franklin D. Roosevelt	NRT, RNA
Umatilla NWR	7/3/1969	302	Washington	15,005	8,907	OR	23,912	Richard Nixon	
Willapa NWR	1/22/1937	102	Washington	17,668			17,668	Franklin D. Roosevelt	MPA, RNA, WHSR
Canaan Valley NWR	8/11/1994	494	West Virginia	17,014			17,014	Bill Clinton	NNL
Ohio River Islands NWR	11/13/1990	458	West Virginia	2,665	468	KY-413, PA-55	3,133	George H.W. Bush (Sr.)	
Fox River NWR	4/19/1979	373	Wisconsin	999			999	Jimmy Carter	
Gravel Island NWR	1/9/1913	29	Wisconsin	27			27	William Howard Taft	W

Hackmatack NWR	11/6/2012	561	Wisconsin	87	127	IL	214	Barack Obama	
Horicon NWR	1/24/1941	174	Wisconsin	21,485			21,485	Franklin D. Roosevelt	R
Leopold WMD	8/7/1974		Wisconsin	14,026			14,026	na	
Necedah NWR	3/19/1939	136	Wisconsin	43,836			43,836	Franklin D. Roosevelt	RNA
St. Croix WMD	10/11/1974		Wisconsin	8,729			8,729	na	
Trempealeau NWR	8/21/1936	94	Wisconsin	6,696			6,696	Franklin D. Roosevelt	
Upper Mississippi River NFWR	8/7/1925	40	Wisconsin	92,036	120,119	IL-33,291; IA-51,775; MN-35,053	212,155	Calvin Coolidge	NRT, R, RNA
Whittlesey Creek NWR	9/30/1999	518	Wisconsin	360			360	Bill Clinton	
Bamforth NWR	1/29/1932	59	Wyoming	1,166			1,166	Herbert Hoover	
Cokeville Meadows NWR	10/12/1993	490	Wyoming	8,928			8,928	Bill Clinton	
Hutton Lake NWR	1/28/1932	58	Wyoming	1,970			1,970	Herbert Hoover	RNA
Mortenson Lake NWR	5/20/1992	474	Wyoming	2,541			2,541	George H.W. Bush (Sr.)	
National Elk Refuge	8/10/1912	28	Wyoming	24,778			24,778	Woodrow Wilson	
Pathfinder NWR	4/19/1928	45	Wyoming	16,807			16,807	Calvin Coolidge	
Seedskae NWR	11/30/1965	280	Wyoming	26,209			26,209	Lyndon B. Johnson	

Notes:

1. The above table displays information for refuges and wetland management districts; Coordination areas and FSA interests are excluded. It also includes 19,139,184 acres of Marine National Monuments not administered under the NWRS Administration Act and thus technically not a part of the Refuge System even though they are managed by the Refuge System organizationally. Abbreviations in column 1: NWR = National Wildlife Refuge, NFWR = National Fish and Wildlife Refuge, WMD = Wetland Management District, WMA = Wildlife Management Area
2. The establishment date is the date that the first interest in lands was acquired. For all WMDs it is the date the first interest in lands was acquired within the present-day boundaries of each District (District boundaries have changed over time).
3. The establishment order is the approximate sequence that refuges and WMDs in today's Refuge System were established. This type of listing is used with caution. It is not an indication of the full historical record of refuge establishment as many refuges were administratively divested prior to 1976 when the law was changed to require Congressional approval before a refuge could be divested. Since that time, very few refuges have been divested but there have been realignments. In some cases, multiple refuges were combined into a single refuge and in other cases a single refuge was split into two or more refuges. This results in unit counts and establishment dates subject to change over time. WMDs are administrative units whose boundaries have shifted considerably over time; therefore, the establishment date of a WMD could change over time when boundaries are changed.
4. The SDA column indicates whether a refuge or WMD contains a "Special Designation" (there are more than one designated site in each category in some cases). Abbreviations used here: MPA = Marine Protected Area, NHL = National Historic Landmark, NM = National Monument, NNL = National Natural Landmark, NRT = National Recreation Trail, R = Ramsar Wetland of International Importance, RNA = Research Natural Area, WSR = Western Hemisphere Shorebird Reserve, WSR = Wild and Scenic River, W = Wilderness, and WHS = World Heritage Site.



Eastern prairie fringed orchid, Iowa

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Page 109, upper left – Ridgefield NWR waterfowl hunters by Brent Lawrence, FWS
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Page 109, upper center – Santa Ana NWR wildlife observation by Steve Hillebrand, FWS
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Page 109, upper right – Cape Romain NWR youth with fish by FWS Cape Romain NWR
<https://www.facebook.com/caperomain/posts/pfbid023qd4v977RgpEapakUT8KS8ZqE8vzycNr qPZj1gyE48H3Lfz8pTip54Vsasb7dVv2I> (public domain)

Page 109, lower left – Ding Darling NWR nature photography by Steve Hillebrand, FWS
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Page 109, lower center – San Luis NWR environmental education by FWS
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Page 109, lower right – Big Muddy NWR interpretive kiosk by FWS
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Page 109 – Tule Lake NWR California quail by Dave Menke, FWS
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Page 113 – Bosque del Apache NWR sandhill cranes by FWS Southwest Region
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Page 117 – Cape Romain NWR volunteer relocating sea turtle nest by Steve Hillebrand, FWS
https://commons.wikimedia.org/wiki/File:Volunteer_-_DPLA_-_5bf6f6eef42326585bbb38f8e4945190.JPG (public domain)

Page 141 - Eastern prairie fringed orchid by Kristen Lundh, FWS
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Postscript

This document is intended to be updated over time. If you have additions or corrections or if you would like assistance researching information about the Refuge System please email nwrs.history.future@gmail.com

This document was assembled by Ken Grannemann as a volunteer for the National Wildlife Refuge Association. He assembled these materials in his retirement following 43 years of federal service, 4 years with the Tennessee Valley Authority and 39 years with the U.S. Fish and Wildlife Service. He had the privilege of working 34 years with the National Wildlife Refuge System including work in the Refuge System's National Headquarters from 1986 to 1988 and from 1990 until his retirement in 2015. He had the privilege of working with 10 different Refuge System Chiefs (Jim Gillett to Cynthia Martinez) during his time at the NWRS National Headquarters.

One of Ken's favorite quotes:

"What is man without the beasts? If all the beasts were gone, man would die from a great loneliness of the spirit. For whatever happens to the beasts, soon happens to man. All things are connected.

You must teach your children that the ground beneath their feet is the ashes of our grandfathers. So that they will respect the land, tell your children that the earth is rich with the lives of our kin. Teach your children that we have taught our children that the earth is our mother. Whatever befalls the earth befalls the sons of earth. If men spit upon the ground, they spit upon themselves.

This we know; the earth does not belong to man; man belongs to the earth. This we know. All things are connected like the blood which unites one family. All things are connected.

Even the white man, whose God walks and talks with him as friend to friend, cannot be exempt from the common destiny. We may be brothers after all. We shall see. One thing we know which the white man may one day discover; our God is the same God.

You may think now that you own Him as you wish to own our land; but you cannot. He is the God of man, and His compassion is equal for the red man and the white. The earth is precious to Him, and to harm the earth is to heap contempt on its creator. The whites too shall pass; perhaps sooner than all other tribes. Contaminate your bed and you will one night suffocate in your own waste.

But in your perishing you will shine brightly, fired by the strength of the God who brought you to this land and for some special purpose gave you dominion over this land and over the red man.

That destiny is a mystery to us, for we do not understand when the buffalo are all slaughtered, the wild horses are tamed, the secret corners of the forest heavy with the scent of many men and the view of the ripe hills blotted by talking wires.

Where is the thicket? Gone. Where is the eagle? Gone.

The end of living and the beginning of survival."

– attributed to Chief Seattle, 1854