

**Renewable Natural Resources Foundation Congress on Sustaining Natural
Resources and Conservation Science: What is at Stake in the Years Ahead
December 13, 2012**

First of all I would like to thank Bob Day for inviting me here at this earliest stage in the morning before everyone is fully awake. Also I think it takes a real leap of faith to have a conference called “What is at stake in the years *ahead?*” and open with a historian.

Historians are notoriously bad prognosticators, but we are perhaps competent at giving a historical context for what has come before us, and that is what I would like to do this morning. To give some context and I will lay my biases on the table early on. As the historian for the U.S. Fish and Wildlife Service, I am shamelessly interested in wildlife those charismatic poster children for calendars and power points.

The title I was assigned was *America’s Historic Role in Conservation Management and Science* a topic whose very title implies that we have been a world leader in the environmental movement; but leaves open the question before us, do we remain a leader and *will* we remain a leader? I will leave that to all of you, remember I already told you we historians are better at looking backward than forward—just ask my kids.

Before we look at our pioneering tradition in conservation leadership it is worth remembering that we achieved this role after being unparalleled leaders at destroying our American environment. Now when Europeans first settled in North America they were struck by two aspects of this new continent: its wilderness aspect [**Albert Bierstadt: MT. Corcoran 1887**] and its seemingly endless supply of fish and animals. [**Beavers at Niagara**] But it did not take long for this awe to give way to the ax and by the mid-1800s America’s soils, forest, and fisheries were all suffering in the Eastern half of the United States.

As is always the case, it was in the wake of this rampant destruction that our first homegrown conservationists emerged, George Perkins Marsh. **[Marsh]** A Vermonter who had witnessed first-hand the destruction of his states forests and fisheries, Marsh wrote the first American text on the conservation (and ecology for that matter) *Man and Nature* published in 1864. **[Man and Nature]** *Man and Nature* is a first person account of the historic destruction of the Mediterranean environment and the ongoing destruction of the American environment, the message being we could end up like the deserts of North Africa if we did not mend our ways. Marsh's words sound eerily prophetic calling for a national park system, a national forest system, all against the backdrop of the climate change that had transformed North Africa from breadbasket to desert. **[North Africa]** Unfortunately for Marsh and the country, the book was published in the midst of the Civil War and its full impact was not appreciated until decades after its publication.

Most of Marsh's revolutionary conservation ideas had emerged in 1857 when he was the Vermont state fish commissioner. In that role he identified perhaps the major type of wildlife at risk in this early era that nation's fisheries. Although we often think of the American conservation movement being tied to birds, bison, or forests, it was actually fisheries that represented the first concerted national concern and federal intervention. **[Fish Came First]** The U.S. Commission on Fish and Fisheries was begun in 1871 under President Ulysses S. Grant. **[U.S. Fish Commission]** America's fishery resources were only a relict of their former abundance by the mid-19th C. America's streams and rivers had been described by early explorers as so full of trout you could cross them on the backs of fish without getting your feet wet. By the mid-1800s game fishes were becoming increasingly endangered especially in the East and the South. As Americans began to realize their resources were not inexhaustible a new ethic arose to preserve, improve, and use wisely the remaining resources. George Perkins Marsh, Spencer Baird

and others had chronicled the decline of fish among other species and the Fish Commission was to help repopulate depleted fish stocks. [**Baird [Fish Hatchery] [Fish Car]**

This early (and ongoing) fisheries work was pretty extraordinary. It was a federally directed transcontinental effort to restore a declining species. The early fish commission created a scientific infrastructure ranging from the Woods Hole Marine Biological Laboratory to their fishing research vessels. Then they carried out an early form of conservation biology restocking the nations rivers and lakes

With the early relative success of fisheries restoration it was time to tackle other pressing environmental problems. Shortly after the Fish Commission in 1885 the Office of Economic Ornithology and Mammalogy (later renamed the Biological Survey). [**Death Valley 1891**] The Biological Survey took its name literally and began a series of surveying missions across North America to determine where the nation's flora and fauna was and why it was there. [**Life Zones 1898**] Led by the superb naturalist C. Hart Merriam, these Surveys were in many ways the beginning of American ecology.

With a baseline of data to begin with it was clear that other non-fish game species were also rapidly disappearing. [**Passenger Pigeon hunt 1867**] The passenger pigeon became a striking symbol of humanity's power to entirely eliminate a species. The extinction of the passenger pigeon was all the more striking because it was probably the most populous avian species ever to exist. At late as 1878 in Michigan an estimated 136 million of these birds nested in an area 75 miles by 10 miles. This group behavior was to prove their doom. By 1914 the last of this species, Martha, died alone in the Cincinnati Zoo. Many other birds were also under extreme pressure either due to overhunting (like the passenger pigeon) or the plume trade which helped make certain feathers literally worth their weight in gold.

The most striking large mammal seeming following the trajectory of the passenger pigeon was the bison. **[Bison]** The bison was well-suited to the conditions of the American Great plains and when the first white settlers arrived it may have numbered around 60 million. Like the doomed passenger pigeon it was gregarious. With the reintroduction of the horse into America by DeSoto around 1541 many Plains Indians developed a whole culture around the buffalo. They provided sustenance and spiritual links for many of the Native Americans living in this area. Yet the same grasslands that sustained the buffalo and the Indians also provided an opportunity for cattle and grain farms. In 1862 the Homestead Act granted 160 acres of federal domain land to anyone who would farm it. In conjunction with new farms, rails were moving into the land of the buffalo. Rail crews were fed by hunters like Buffalo Bill (William Cody) who shot up to a 100 buffalo a day. In addition, more buffalo were slaughtered in an effort to drive out hostile Plains Indians and force them to relocate to government reservations.]

taxidermist, skulls] Ironically both the American Indians and bison would end up on government reservations largely removed from their original environmental context.

People who observed these slaughters were frequently moved to protect species in late 19th C. conservation. George Bird Grinnell (1849-1938) had traveled west on a number of scientific expeditions and he was struck by the destruction of the buffalo writing a famous "Ode to the Buffalo." **[Forest and Stream]** When he returned East he made his magazine Forest and Stream (1876) a tireless advocate in the 1880s for stricter game laws and abolishing market hunting and destructive fashions. **[Market Hunt]** **[Slide of woman with bird on head]** The wanton slaughter of birds and big game offended Grinnell and many other hunters who wanted to insure that enough game remained for posterity. **[Audubon]** In 1886 he founded the Audubon Society of New York--a forerunner of the National Audubon Society--an organization at the forefront of bird

protection. In 1887 he was a founding member of the Boone and Crockett Club with Teddy Roosevelt and other wealthy New Yorkers, the purpose of which was to preserve enough large game so it could still be hunted. **[TR in Buckskins]** Although interested in preservation of wildlife it was clearly of a utilitarian nature. Along these lines when land was finally acquired in 1908 to preserve the buffalo it was for a game range, which has since become the National Bison Range.

Sportsmen also looked to legislative remedy for what they called "game hogs" or those who were exterminating entire species. It was the abuse of game animals that led in 1900 to the passing of the Lacey Act which first gave federal legal protections to wildlife. **[4 slides: Lacey, John Perry]** Grinnell, Roosevelt and other early sportsmen-conservationists sought to preserve some aspects of Frontier life that were rapidly disappearing in an industrializing age. No country had defined itself so closely with its wild lands or wildlife and these early conservationists genuinely feared the loss of both. The 1890 census has officially declared an end to the American frontier and the opportunities to visit and hunt in wild lands was seen as a potentially vanishing resource. To this end more aggressive actions were taken to preserve both wildlife and their habitat for future generations.

In the early conservation movement it was assumed sportsmen, preservationists, and those who would wisely harvest resources would unite behind the banner of conservation. Teddy Roosevelt embodied all three impulses and he appointed a good conservationist in the new Forest Service. **[Pinchot and TR 1907]** Pinchot was born of well-to-do parents and chose to study the rare career of Forestry in Europe as a young man. Upon his return he worked at reforesting wealthy individuals estates, he set up the Yale School of Forestry, and he helped create the United States Forest Service in 1905 under Theodore Roosevelt's Presidency. He knew a fair bit about trees and he suggested raising them as a

crop to preserve an adequate supply for posterity. [**Lumberjacks**] This utilitarian outlook on nature and this new found cult of expertise was endemic in early twentieth century conservation. [**Forest Service**] Conservation in these early years has been characterized as the Gospel of Efficiency, in that neither forests, nor resources were to be wasted. However, this did not imply any protection for a relatively unproductive wilderness area. [**Meadow at Yosemite**]

The most famous contemporary advocate of wilderness values was John Muir. [**Muir and Sierra Club, 1892**] Wise use and preservation came into direct conflict when a part of Yosemite Valley was scheduled to be flooded to provide clean and cheap drinking water for San Franciscans. Here again I remind you places matter. Hetch Hetchy was a valley in Yosemite Park an area that had transformed John Muir into an advocate for the wilderness and a place he had taken Teddy Roosevelt, John Burroughs, and Ralph Waldo Emerson. [**Muir and TR 1906**] This was holy ground and when Pinchot supported damming the valley in 1905 Muir was aghast. Muir declared: "Dam Hetch Hetchy! As well dam for water tanks the people's cathedrals and churches; for no holier temple has ever been consecrated by the heart of man." At Hetch Hetchy something interesting had occurred. When the conservation movement began at the turn of the century it easily encompassed differing groups of sportsmen, preservationists, and utilitarian resource managers. But when it came to a particular piece of land like Hetch Hetchy it became evident that perhaps not all uses were compatible. Pinchot's forces won and the dam was begun in 1913. [**Hetch Hetchy before**] [**Hetch Hetchy after**] But the results were not so clear-cut. Although wise-use folks won the battle they lost the war. In 1916 the National Park Service Act was passed to ensure parks would be preserved and not exploited. [**NPS**] In 1964 the Wilderness Act was signed [**ANWR**] ensuring that Muir's beloved wild places would survive.

Theodore Roosevelt encompassed aspects of both Pinchot's utilitarianism and Muir's preservation instincts. **[TR and Pinchot]** Most importantly he began the activist phase of federal conservation. His work with Pinchot, Muir and others firmly established a role for government preservation of the nation's resources. Roosevelt and Pinchot helped coin the new word “conservation.” Conservation, borrowed from an English term denoting “foresters” was reconfigured in the American context to mean: “ the wise use of the earth and its resources for the lasting good of men.”

Besides his work with national forest and parks, Roosevelt also began the nation's refuge system. **[TR at Breton Island]** In 1903 he issued an executive order that created the first National Wildlife Refuge at Pelican Island off the east coast of Florida. **[Pelican Island]** Pelicans and other birds on the island were threatened by market hunters, plume hunters and vandals.**[Market Hunting]** Paul Kroegel put first himself and then the power the government between himself and the hunters. **[Kroegel Pelicans]** By the end of his first term Roosevelt had created 55 National Wildlife Refuges, 150 National Forests, 5 National Parks, 18 National Monuments, and convened the first White House Conference on Conservation. In some ways we are the heirs to this initial conference 104 years ago, sitting here in DC debating the future of conservation. Theodore Roosevelt was an unsurpassed instigator, enactor and popularizer of this new idea that America’s natural resources belonged to all of the American public and not just a greedy few.

This idea has sometimes been described as the North American Model of Wildlife and is based on 7 principles which were seen as unique to this continent versus older systems in Europe or Asia. The pillars included:

- 1. Wildlife belongs to the American public.**
- 2. Market and commercial hunting is banned.**
- 3. The allocation of wildlife is by law, not power, wealth or position.**

4. **Under the law, every citizen has an equal opportunity to hunt and fish.**
5. **Wildlife can be killed for food, fur, self-defense or property protection. Frivolous use is not acceptable.**
6. **Wildlife is an international resource and should be managed as such.**
7. **Scientific management is the cornerstone to maintain viable populations.**

Most of these pillars began to emerge in Roosevelt's presidency but they would be expanded upon in the last half of the 20th century spurred on by a combined ecological and economic disaster.

Federal intervention in the nation's lands persisted growing at a modest rate until environmental disaster in the 1930s escalated federal control over nature. **[Dust Bowl]** On the 14th of April 1934 a black dust storm darkened the Texas sky and left dirt drifts up to 20 feet high on city streets. On the 10th of May 1934 another storm moved East and dumped 12 million tons of dirt on the city of Chicago. Dust from that storm drifted onto the steps of the White House and fell on ships in the Atlantic. The middle section of the United States was picking up and blowing away, the result of poor stewardship. The ecologists Frederic Clements warning that farmers were continuously disrupting the local processes came true with the onset of the "dirty thirties" as they were called in response to the blackened skies caused by the Dust Bowl. **[Burned out farm]** Clements succession theory of ecology claimed that grasslands, not wheat farms were the natural system for the Great Plains. It was as striking claim and one that was repeated in films like *The Plow that Broke the Plains* which overtly used Clements' ecological theories to help explain the causes of the Dust Bowl. But beyond propaganda films the government mobilized in other ways to put Clements' ecological theories into social practice.

Okies were not the only victims of the Dust Bowls migratory waterfowl also found their habitats destroyed. **[Okie Ducks]** As migratory waterfowl numbers reached their nadir in the early 1930s Aldo Leopold, Jay Ding Darling and Thomas Beck were appointed to a

"Duck Committee" (1934) to devise plans for wildlife preservation. [**Ding**] Darling took over the Biological Survey in 1934 and sought to revitalize the refuges. He created and drew the first Duck Stamp in 1934, he created the blue goose logo to define the refuge system in the same year, and he succeeded in drawing in a cadre of free New Deal Labor the Civilian Conservation Corps to work on 53 refuges and fish hatcheries to restore our resources. [2 Slides Bucks for Ducks] [4 Slides on Refuges]The CCC may well have been one of the best American ideas that we abandoned. [CCC]Between 1933 and 1945 more than 2.5 million youths worked on forests, parks, refuges, and sometimes even private lands. This created a massive conservation constituency among the young (and their families) the likes of which have rarely been seen before.

In the 1930s Darling and Aldo Leopold had been pioneers in working with land grant universities. [Leopold Coop]In 1935 Darling started another innovation The Cooperative Wildlife Research Unit Program when five units were established at land grant universities. Additional units have been added in many states since that time. In 1961 the Cooperative Fishery Research Unit Program was initiated. Beginning in 1984, Wildlife and Fishery Units were combined and called Cooperative Fish and Wildlife Research Units. At the present time, there are 40 Cooperative Research Units (see map). The objectives of the Units are essentially unchanged since 1935[**Coop Slide**]:

conduct research basic to the management of fishery and wildlife resources,
educate fishery and wildlife biologists at the graduate level, and
provide technical assistance to conservation agencies and groups.

In this fertile decade of conservation innovation there was also launched the Pittman Robertson (Federal Aid) Act of 1937 which provided new funds for wildlife habitat. [P-R Act] This Act charged a small excise tax on initially hunting equipment (and later

fishing gear under the Dingell Johnson Act) to support primarily state wildlife efforts. This was a pivotal Act for 2 reasons. First, it provided dedicated funds to state conservation efforts whose budgets had previously been raided whenever a state deficit emerged. Second, they provided a critical new constituency for conservation. Just like the Duck Stamp it asked a prime user of our natural resources to pay for it. This was perhaps the perfect embodiment of the North American Model of Wildlife Management where the public both owns and pays for its wildlife. Of course, as you talk over the next day and a half about budgets and funding you will realize the quandary we face currently. Much of our budgetary apparatus was designed in the 1930s on the backs of sportsmen when hunting was far more popular than it is today. While their numbers and, in particular, proportion of the population has been shrinking they still bear the brunt of state fish and wildlife conservation and management.

Aldo Leopold took some of these recent changes in federal conservation and gave them a new scientific and ethical framework. **[Leopold Forest Service] [Leopold and Bow]** First Leopold seized on some of the new work in ecology to give a new scientific framework to game management. He began to argue that our ecosystem functioned like an interconnected piece of machinery and like any intricate machinery the first rule was do no harm. **[Leopold Scientist]** Like a fine watch you could not take it apart and throw out a spring here and a cog there and expect it to run properly. The implications for our agency were manifold as it began to call into question a strictly game management outlook that implied among other things, fewer wolves meant more deer. Leopold also proposed a new footing for conservation a new "land ethic" to overcome some of the tensions in preservation vs. utilitarian debates. **[slide: Ethics]** Yet there remained unanswered questions. What was the role of the federal intervention in lands? And would this somehow undermine personal protection of the lands? It was a profound question to ask and probably one that could only be asked in this era of a greatly

expanding federal role in conservation. Today we take this role for granted, but Leopold who helped create this world saw it for the revolution it had become. **[Leopold and Wilderness Society]**

So far the figures I have looked at have fit easily into the first stage of the American Conservation Movement. In the post World War 2 era, I would like to argue that a new movement was emerging that deserved a new name, that could fairly be called the American Environmental Movement. Now I know most people consider the terms conservation and environmental perhaps interchangeable and the term “conservation” is a part of the name of the sponsor of this conference and the name of my host institution. But I don’t think they are the same—that is environmental is not the same as putting old wine in new bottles. After World War 2 the conservation challenges faced and the issues addressed changed dramatically. This really marked a new era and the book that kicked it off was written 50 years ago in 1962. I am talking about *Silent Spring* by Rachel Carson the work that signaled a new environmental era.

[Carson] Carson emerged from an earlier conservation era but helped usher in a new environmental era. She began working for the Bureau of Fisheries as an aquatic biologist in 1936. She began editing and writing many of the publications for our predecessor agencies and in the process learned to write. **[Carson Keys]** She published a popular book in 1951 called *The Sea Around Us* and quit the next year having made enough money to leave the lucrative field of government service. **[Carson Bureaucrat]** Carson spent the next 10 years working on her masterpiece, *Silent Spring*. **[Silent Spring]** *Silent Spring* for the first time effectively used the growing scientific field of contaminants and hitched it to an ethical outlook on nature that respected all living things, including species often considered pests or vermin. **[DDT]** Carson's ethical arguments were clearly based on her ecological principles, in many ways this was the first book exclusively on ecological

ethics. Carson explains almost like a lawyer arguing a case how DDT accumulated up the food chain and gradually causes disaster at higher levels. [**Silent Wildlife**] To support her claims she added 55 pages of notes many in scientific journals. The broader philosophical and ethical attitude underlying her story is described as "the other road." [**Carson Hawk Mountain**] That is, the road that does not lead to greater control of nature, but rather a balance of nature.

One can read between the lines Carson's model of how science ought to work. She thinks the present situation is the result of human hubris toward nature and an unthinking acceptance of new technologies. The idea of changing and controlling nature, she claims has traditionally been thought of as good:

The "control of nature" is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists for the convenience of man.

Carson preferred to argue, by contrast, one should assume nature knows best and the weight of evidence must be shifted to those who would control nature. As opposed to total control over nature (as the postwar American chemists promised), Carson claimed what was needed was a readjustment of human attitudes toward nature and support for a balance of nature. Carson's message was clear. Humans should replace **control** with a **balance** in nature and be satisfied with a manageable number of insects largely kept under some control by their natural predators and limited implementation of other biological measures.

Carson worked on *Silent Spring* in an era when science was dominated by the total war and the ultimate weapon of the atomic bomb. She saw the results of total extermination in Hitler's holocaust and the results of total mobilization of science and society in the

bombings of Hiroshima and Nagasaki. In the wake of these terrifying results of, what she perceived as total control, Carson felt it might be time for humans to restrain themselves and begin controlling themselves, not nature. Carson, is important for another reason. She began an era of political ecologists, that led to the politicizing of the environmental movement. **[Nixon Env. Regulations]** **[Earth Day 1990]** This was carried out in several different ways by a new generation.

In addition to making ecology a political movement as well as a scientific term, Carson also ushered in a new era of human restraint perhaps best epitomized in the Wilderness Act and the Endangered Species Act. **[LBJ Signing Wilderness Act]**. The Wilderness Act was in some ways an attempt to reverse time and re-create a forest primeval—the Wilderness Vision from which we began this talk oh so many hours ago. **[John Muir Trail]** Perhaps the most beautifully written piece of legislation ever it calls for:

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.

Of course this is naïve and idealistic—both positive traits in my opinion of the American Environmental Movement. By 1964 there were no parts of the globe truly untrammelled by humans and the purposeful removal of Native Americans had created these potential wilderness areas. But it was also endearingly idealistic in thinking we might re-create a 200 year old landscape and the value it attached to this landscape.

If anything even more idealistic was the Endangered Species Act of 1973. **[Endangered Species]** A complicated and controversial piece of legislation it was far ahead of its time and remains so. **[Habitat for all species]** Although overly complicated by many of its critics and attempts to appease them, at its simplest it is an attempt to outlaw extinction. If it had a motto (not a bad idea) it would be “no more passenger pigeons.” It mandated

we protect all creatures great and small. Seen in many ways as an evolutionary progression from the early wildlife management it is instead a revolutionary leap forward we are still catching up with. It is one thing to protect species already extant in their habitat it is quite another thing to actually restore them to places from which they have been extirpated. Humans move from being caretakers to environmental manipulators par excellence. **[Rebound Species] [Slow Growth] [Charismatic] [Non-Charismatic] [Bald Eagle] [Whooping Crane] [CITES] [Corridors] {Alaska} [Marine Preserves][Wilderness][Pelican Island]**

So the environmental movement differed in many respects from the pioneering conservation movement. The conservation movement was focused on utilitarian goals, species and landscapes of use or interest to humans, with a focus on natural resources. By the environmental era the circle of protection had expanded to all creatures both charismatic and creepy. There was a new focus on toxins to both human and non-human health. And the engineering ideal of conservation management where well-trained technocrats would best manage our natural resources; had given way in part to a new ethic of human restraint and modesty in nature.

Evolution is our Employer

In a way we may be entering a new unnamed post environmental era. The challenges we face are qualitatively new challenges which make them so horrifying and unprecedented. Three of the greatest challenged we face were largely unimagineable in the 20th century environmental history:

Invasive Species

Climate Change

Generational Change

Marsh Quotes on 3 challenges

And now a neat parlor trick and bookend to this brief overview of American conservation leadership. Nearly 150 years ago at the beginning of the American Conservation Movement George Perkins Marsh wrote eloquently about the troubles that face us in the 21st century. Clearly we have not had a shortage of leaders and visionaries who understand the conservation challenges of today and the tomorrow. *What we lack is of course the strength to listen and the will to act upon them.*

And to that end I leave you with the immortal words of Aldo Leopold who summed up this dilemma much more succinctly than I have in the last 30 minutes when he wrote:

Wildlife Management is Comparatively easy.