



## **Conservation in Agriculture – Then and Now<sup>1</sup>**

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Winston Churchill was quoted as saying, “The farther backward you look, the farther forward you are likely to see.” That tells us we should look at the history of conservation as we contemplate where this profession goes in the future. This particular history does not require us to look backward too far. Most of it has occurred within the lifetimes of people we have known – our grandparents, parents, and co-workers.

But we need to be a bit careful in looking backward. If we interpret what we see as a straight line, we will be misled. History does not move in a single direction, but turns many corners. If we are to see ahead with any clarity, we need to try to look around the inevitable corners that lie in our path. Thus it may be helpful, as we look to the history of the conservation profession, to look at some of the corners that lie behind us.

The history of the conservation movement in the United States was written largely in the 20<sup>th</sup> Century. Although there were earlier events, such as the establishment of the Land Grant College System in 1862 and the beginnings of a national citizen’s conservation movement as early as 1875, the idea of conservation really began to pick up steam in the 1900’s. The initial driving force was the threat of scarcity. People began to doubt that the resources needed for survival would remain available. In those days, conservation wasn’t about environmental protection so much as it was about continued supplies of food, fiber, fuel and water.

Food production concerns dominated agriculture. How could the waves of European immigrants coming to America adapt to the new lands and opportunities they found here? How could the emerging tools of the scientific and industrial revolutions be harnessed to the task of producing food for a growing Nation, as well as a hungry world? One looks in vain to find many linkages suggesting that ideas like soil conservation or sustainable agriculture (even by different names) were much of a consideration. Although some conservation leaders had been speaking out since Colonial times, their voices were seldom heard above the clamor for more production.

In 1894, the Department of Agriculture produced Farmer’s Bulletin 20 that discussed the problem of eroded soils and how to claim them, but it was not until the 1920’s that Hugh Hammond Bennett began writing and speaking on the menace of soil erosion. Bennett, acknowledged as the father of soil conservation, and the founder of this Society, was a soil scientist whose field observations were both widespread and alarming. His views were gaining national attention, and beginning to catalyze national action,

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when the combination of a Great Depression and a Dust Bowl hit the United States in the 1930's. Out of those emergencies, today's soil conservation program was born.

But before we tell the story of that era, let's drop back again and look at another pioneering conservation movement – this one about forests. It had many of the same concerns, only there the rallying cry was the danger of a “timber famine.” At the rate that Americans were cutting and wasting the great forests in the period between 1850 and 1910, there was little doubt about the bleak future that lay ahead.

Try to put yourself in that time frame. A growing and rapidly industrializing Nation was building itself out of wood. Not just houses and businesses, but the bridges and railroads that linked a continent into a country, were heavily dependent on wood as the major construction material. Just the replacement of railroad ties, in an era before wood preservatives, constituted a huge industrial use of wood. And who can forget the old movies where the train stopped to take on wood and water so that the steam locomotive could make it to the next stop? In addition to being a primary source of building material, wood energy was driving America. Charcoal fired the iron smelters, and the average home burned more wood for cooking and heating in a year than it took to build the house.

And the wood was running out. The great forests were slashed with little thought for their replacement. Often they were cleared to provide the land for the agricultural production that was the concern of most rural areas. Where farmers didn't remove it, thousands of acres of heavy slash were an open invitation to wildfire, and millions of acres burned in a dry year. It has been estimated that by the 1920's, there were 80 million acres of former forest that remained unstocked, largely due to repeated wildfires. For comparison, it is estimated that wildfires burned 40 to 50 million acres of land each year during the 1930's. In 2002, one of the worst fire years in recent history, we burned around 6.5 million acres. Bad, but nothing like those early years.

So people were concerned, and justifiably so. And that concern spurred action. Looking back, it is not just their boldness that impresses us, it is the speed with which they moved.

I look at the history of the federal conservation agencies and am awe-struck by the way they unfolded. Franklin D. Roosevelt sent a bill to Congress proposing the creation of a Civilian Conservation Corps, and Congress passed it in 10 days! Within a matter of a few months, Hugh Bennett had 41 demonstration projects and 50 CCC camps in action across a Nation that took a week or more to cross by train! Roosevelt sent out a “suggested” piece of conservation district legislation to the Nation's Governors in February of 1937. By August, the first soil conservation district is formed, and by the end of the year, 22 state legislatures have enacted the law! Think about that! It took almost as long for the mail to be delivered as it did for political action to launch a new idea!

One Sunday in September of 1938, a hurricane tore through New England, killing 600 people and blowing down 4 billion board feet of timber. On Monday, the Forest Service was charged with providing federal assistance and that same day, an Assistant Chief was dispatched from Washington to Boston. During the train ride, he and five assistants planned the organization of a temporary office, selected a staff, and sent telegrams telling 32 experienced foresters to report to Boston immediately. After a one-day meeting to hear the reports of initial field damage surveys, the 32 were sent to set up

6 state offices across the region, in cooperation with the Governors and State Foresters. Within a week, CCC camps were working to reduce the fire hazard before disaster struck communities buried in piles of debris that were often 30 feet or more in depth.

Funds for federal timber purchases were found in Washington, storage sites in ponds and lakes were located, and 60 days after the hurricane, the Forest Service began buying logs that represented almost 8 years of normal timber harvest for the region. By the time bugs and fungus began to damage the downed timber, almost 2 billion board feet had been purchased and stored under water where it could be later utilized. Fifty years later, salvagers were still dredging hardwood logs from pond bottoms where they had been driven into the mud by the huge piles. Having been saved from decomposition, they were good as new!

Today, Congress couldn't pass a CCC bill under any circumstance that I can imagine, and the appeals on salvaging timber from a wildfire disaster will still be in the courts when the logs have deteriorated to the point where there's nothing left to salvage. We have changed the way we operate. Action is no longer urgent anymore. There may be several reasons for that. Clearly, most Americans do not now see any natural resource shortage as a threat. They can always get what they need at Safeway or Home Depot.

But I would argue that there are other, deeper, social changes that have been part of this shift. Clearly, conservation programs, agencies, and organizations reflect the society in which they operate. It couldn't be any other way. And these programs are, like everything else, caught in social cycles that have, according to some authors, been a fact of life for decades.

In their 1997 book, *The Fourth Turning*, authors William Strauss and Neil Howe pointed out that our society goes through cultural and political cycles of eighty to one hundred years, during which time people change how they feel about themselves, about the nation, and about the future. Each such cycle, they argue, is composed of four seasonal changes representing growth, maturation, entropy, and destruction. From that destructive period at the end comes a rebirth of fundamental change, driven by fresh and renewed energy, leading once again to growth and maturation. Without trying to argue their case, think about the underlying idea for a moment, in light of where we have come within the history of our own conservation movement.

Since the conservation movement began, America has undergone a 5-fold population increase accompanied by major social, economic, and technological changes. As people witnessed and responded to a Great Depression, a Dust Bowl, and two World Wars, their social priorities and values, as well as the political tides, have reflected what many have called the most significant changes experienced in any Century of recorded history.

On the political front, Americans have vacillated back and forth about their wish to have government address problems and issues. In 1994, we elected people to Congress on platforms that sounded as though the country would be better off if we eliminated the federal government and turned everything over to individual actions or states. That changed pretty abruptly on September 11, 2001, but the most popular political refrain again in this Congressional election campaign seems to be to "cut taxes," and we listen in vain for a politician bold enough to suggest that we need to do anything new and positive beyond homeland defense or squashing Iraq.

That wasn't always true. In the 1930's, people welcomed a national leadership that mobilized positive action. After Pearl Harbor, we mobilized millions of people in armies and factories, and cranked up the greatest industrial production machine in human history. On America's farms and forests, people produced food and fiber as though their lives depended on it, which they almost certainly did. That was a "can-do" period in our history, driven by a shared sense that the Nation was at risk, and things needed to be done. The public attitudes that drove those actions shaped the soil and water conservation movement. That's how you get an "instant" CCC.

Compare that with the social and political situation we watched develop in the 1980's and 1990's. During that period, it seemed like we became a "don't do" society. Instead of rolling up our sleeves, grabbing our tools, and doing something, we spend most of our time conducting impact studies to make certain that nothing got hurt or nobody inconvenienced in the process. And, if whatever someone was trying to do had any impact, it was almost certain that someone else wouldn't like it. And they could stop it. A disgruntled former Governor, South Dakota's William Janklow, was quoted as saying, "Anybody can wreck anything in America." Strauss and Howe put it like this: "Where we once unified behind a positive agenda that involved bulldozers and factories, we are now transformed into enervators who work to prevent the bulldozers and factories from hurting anybody or anything." Does any of that strike a chord with anything you have experienced in your own lives, or in the organization in which you work?

I don't want this to sound like a call to return to the bad old days of "damn the torpedoes and full speed ahead." We've learned a lot about the price in unintended consequences that is often associated with headlong action. But if, as in history, the cycles continue to turn, how can our conservation movement come around the next corners in America's social and political life and emerge stronger, rather than weakened?

The point is to recognize that situations change, and the demands on institutions will change accordingly. I would argue that the best bet for the next corner is to plan for an end to the "more process and less progress" trend that consumed us for the last 20 years of the 20<sup>th</sup> Century, and prepare for a time when people demand "more progress and less process." Will we be ready, with the concepts and the capability, to meet that demand?

I believe that we can, in fact, be ready, and that brings me to the last idea I'd like to share with you. As natural scientists, as a conservation team, we have in front of us the single most exciting opportunity in the history of our movement. We can actually begin to do what conservation leaders have been theorizing for decades. We can design, and teach people how to operate, sustainable natural resource systems.

We've had the theory, since Pinchot and Bennett. Pinchot espoused "the greatest good for the greatest number over the long term," and Bennett talked about "using every acre within its capability and treating it according to its needs." Those leaders knew what needed to be done, and while people have tinkered with the words in the interim, the underlying concepts remain as relevant today as then.

For a variety of reasons, neither concept could be implemented easily in the past. At times we lacked the tools, and throughout the second half of the 20<sup>th</sup> Century, both technical developments and social trends were dead set against conservation. Today, we've got the tools, and maybe, just maybe, the wrenching changes we're seeing in the past year will provide the turning point on the social trends.

An example from another technology may illustrate the point about tools. Maurice Goddard, the “father” of America’s space program, had the theories of space flight solved in 1915. His formulas, it is reported, were right on the money. Two problems remained. First was the power to lift a ship out of earth’s gravity. Second was a guidance system that could calculate speed and position rapidly enough. When rockets were invented in World War II, the power problem began to be solved, but the guidance challenge remained. A computer that could solve the guidance equations quickly was so heavy that no rocket could lift it. Finally, in the 1960's, that problem was solved as new technologies led to massive increases in computing power coupled with miniaturization. Today, we’ve grown accustomed to people and machines flying in orbit, and we use Goddard’s theories every time we pick up a telephone or use a satellite image to help plan a land management project.

In terms of the difficulty facing conservation theory, the U.S. has gone through a period when technological change led people to believe they could do anything they wanted, just about anywhere on the landscape. Instead of using land within its capabilities, people tried to shape the land to their immediate needs. By harvesting a one-time geologic store of fossil fuels, we could build and operate machines, synthesize fertilizers, and create chemicals to overwhelm natural systems and replace them with factory-type production. Few people worried about what was happening to the land under these onslaughts. Conservation concerns were brushed aside by the allure of a new technological fix for every problem or limit.

On that industrial model, bigger always sounded better, and in many ways, that continues to this day. Between 1962 and 1992, the number of farms in the U.S. dropped 48 percent, from 3.7 million to 1.9 million, while the average size jumped 56 percent. Between 1982 and 1992, farm numbers continued to shrink in every size class except those of 1,000 acres or more, where numbers went up 6 percent. In that same decade, the average number of milk cows per dairy was up 55 percent while the average number of hogs and broilers per farm jumped 80 percent.

The costs associated with this “bigger is better” syndrome are environmental, economic, and social, and they continue to escalate. At some point, they will break the system, and that point may be closer than many people would like to admit. Most estimates suggest that the mid-point of the petroleum supply will be reached around 2010. From then on, fossil fuels will become steadily more expensive, and any system that relies on heavy fossil subsidies to survive will be in trouble.

As a result, the buzz word in natural resource management today is sustainability. Increasingly, national and international attention is being drawn to the need for moving toward sustainable systems. The concepts around sustainability are being debated and sharpened, and real-world criteria, indicators, and performance measures are being developed. I’ve worked mostly with sustainable forestry discussions, but the principles are the same for all systems. A sustainable system is one in which:

1. Ecological integrity is maintained;
2. The yield and quality of goods and services are sustainable, and maximum wellbeing is produced with minimum throughput of energy and materials;
3. The public institutions are in place to assure continuation of the sustainable condition; and,

4. People are satisfied with the outcomes, and society accepts responsibility for maintaining the sustainability of the system.

If you think about those criteria, they aren't limited to forests at all. If an agricultural or grazing system met those criteria, we would think it was as sustainable as we know how to make it. The truth is, few systems qualify.

But sustainable farm and forest systems are increasingly being demanded by the public, and called for in public policy. And therein lies enormous opportunity for the conservation community. Like the rocket that made Goddard's space theories practical, this search for sustainability is the engine that can power Bennett's vision. Because the truth is – modern science notwithstanding – one of the best ways to design a system that maintains ecological integrity and produces sustainable yields at minimal costs is to use every acre within its capabilities and treat it according to its needs. We've known that all along; and as the rising price of fossil fuels triggers a more urgent search for sustainability in the future, it may provide the power of public opinion needed to implement the theory.

And, much like the space program – in fact, because of it – we now have the computing power to guide the search. With better mapping and monitoring from aerial and ground imagery and measurements, coupled with the process models produced by biological research, and expressed in maps and data sets generated by modern computer programs, we can do a much better job of calculating and illustrating the likely outcomes from a variety of land management options. Better decisions can result from better information, and that information can come from the skills and talents within the conservation team. Like the NASA of the last quarter-century, our ability to fly as high as our pioneers dreamed is at hand.

To achieve those visions, however, I see two more ideas that the conservation community has yet to fully embrace that may be helpful, if not essential. The first of those ideas would amount to a new understanding of the role of scale in national policy-setting and problem-solving.

We identify national problems in terms of millions or billions to justify the need for the national purpose to address them. I once helped publicize the fact that we were losing a million acres of prime farmland a year. That was, and still is, a national problem. Millions matter. But once that national problem was recognized, Washington policymakers started looking for some kind of a million-acre national solution. That was the wrong search. The million acres is made up of thousands of 20- and 40-acre conversions. What's needed are locally-adapted solutions for 40-acre conversions.

Those different solutions won't emerge from a micro-managed national program, no matter how many pages of legislation or program regulations are drafted. They must be found, primarily, in communities of interest that are solution-sized rather than problem-sized in scale. Localized solutions are the ones that really work in many instances. The conservation program has demonstrated that principle over the years with individual farmers and ranchers, conservation districts, watershed projects, and other locally-led efforts. But we haven't always been successful in convincing national policy makers to take advantage of what has been learned. Where that is the case, we've still got a lot of work in convincing other people about this issue.

The second idea is that we need to make certain our conservation vision takes in the whole landscape, including the people in it, and considers what must be done in terms

of entire ecosystems and their management. Unfortunately, as I have encountered often in my dual career with soil conservation and forestry interests, different professions don't talk to each other as effectively as they might, so neither sees the whole picture as well as they could.

Let me give you a current example. There are almost 10 million forest owners, and the number grows at a rate of around 150,000 a year. In some communities, the break between urban and rural forests is so indistinct it's hard to tell where one stops and the other begins. In many watersheds, achieving watershed goals means getting cooperative action out of hundreds of small landowners, many of whom have forest as the dominant vegetative cover on their land, but whose lives are dominated by urban concerns.

As ownerships and operating units get smaller, technically-sound management gets more difficult. The technologies are known, but you have to educate a lot more people, and get cooperative action among a more diverse and difficult group. The science is easy compared to the institutional and social challenges facing many conservation programs.

This is an important aspect of what the conservation community faces in the future. Think about it. Mega-farms and mini-forests seem to be where we're heading. The programs and approaches we developed in the 20<sup>th</sup> Century were aimed at family-sized farms and forests. Do you think they will fit this new bi-polar land ownership structure? I doubt it. What are we doing to understand the implications of these trends?

The challenges to the conservation team, I would argue, are fairly clear. We can begin to lay the groundwork for the next round of social change, when people once again demand that action be taken and things be done. We can gird ourselves and our organizations to recognize and articulate what needs to be done, know how to do it, and show people we can do it. We can develop a strategy -- or set of strategies -- that function effectively with both mega-farms and mini-forests.

Or, conversely, we can be swept away as incompetent relics of a past that no longer has relevance, and replaced by people and organizations of purpose and action in the new context. We can't predict when, or in what form, the turning point will come. I believe we may already be in such a transition, triggered by 9-11 and our current economic situation. We can't be sure yet, but the signals seem to point that way. What we know, from observing the past, is that these transitions produce difficult, traumatic times that call for the best in people and organizations.

As the current transition challenges the conservation community, our best strategy, in addition to a bias for positive action and a demonstrated capacity to act, is to keep our sights set on the whole ecological and social landscape, teach an understanding of ecosystems and their sustainable management to every member of the conservation team, and harness every tool of modern science, including modern social and political science, to help illustrate and guide the task. Our commitment, as members of the conservation team, must be to aspire to the type of greatness that marked conservation pioneers, and to be a leader in, rather than a casualty of, the great challenges that lie ahead in the 21<sup>st</sup> Century.