

Thinking Like a Watershed

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I'm delighted to be here and I thank Randy Moore for that kind introduction. I congratulate you, the leadership of the federal natural agencies, for all you do for this nation. Based on my quarter-century of public service, mostly with the Forest Service, I know first-hand the challenges that you face and the high-quality employees you represent. The theme of this conference, "Thinking Like a Watershed", couldn't be more appropriate.

Security....Since September 11, the term has become part of our daily lives. We have the new Homeland Security Act designed to protect the security of America and our borders. We initiated military action in Afghanistan to make us and the Afghans more secure by routing out the terrorist network that was behind the tragic attacks on the World Trade Center and the Pentagon. The United States and Great Britain attacked Iraq to make the world more secure. Most recently, President Bush has asked Congress to appropriate \$87 billion in part to help make the world more secure.

Hearing the term again and again has caused me to think a lot about what the term really means, especially as it relates to the land and to natural resources management, the world in which I have devoted my professional life. I've also thought a lot about the following question: While we all want to be free and secure within our borders and we want the world to be a more secure place for all humanity, are we not making a mistake viewing threats to our security only in terms of terrorism, chemical weapons and weapons of mass destruction?

Yes, these threats are real, but they're not our only threats. There are other threats to our long-term security – threats to the air we breathe, the water we drink, the land we live on – these threats are as real and potentially as damaging to our long-term well-being and security as those posed by dictators and desperation.

To put what I'm talking about in historical perspective, let me talk for a minute about Iraq, the place that has dominated the world news the last several months. Iraq was once home to ancient civilizations centered along the Tigris and Euphrates Rivers and home to Mesopotamia, one of the great cradles of civilization and the biblical location of the Garden of Eden. This region, also known as the Fertile Crescent, was the "cradle" of agriculture. But today, as we have seen on the television newscasts, the region is anything but fertile or lush due in large part to environmental mismanagement, especially the misuse of water and soils over thousands of years. The once-great agricultural societies that sprouted from the region's rich flood plains today lie in ruins on a parched landscape. In simple terms, too many people pushed the land too hard for too long.

Unfortunately, the story of ancient Iraq is repeating itself today as the world faces a multitude of environmental threats: fertile soils are being washed away and becoming too salty to support agriculture, precipitation regimes are changing, water tables are falling, lakes and streams are drying up, and grasslands and former forests are slowly transforming into deserts.

A modern example is currently unfolding in China where the Gobi Desert expanded by over 20,000 square miles during the 1990s. At the same time, China's food production fell below consumption. The potential ramifications for world food security are mind-numbing – China accounts for a sixth of the world's human population.

Even in the United States, as we work feverishly to secure American families from the threat of terrorism, we are facing unparalleled environmental threats to our long-term security. General Riley told us this morning that the State of Louisiana is losing wetlands at the rate of about one football field every 45 minutes. About 40,000 acres of coastal wetlands providing essential spawning, feeding, and nursery areas for three-fourths of U.S. commercial fisheries are disappearing each year. Of the fully-assessed U.S. fish stocks, 40 percent are depleted or are being over-fished.

So now, in the name of national security, let's consider the land and common-sense conservation. For the sake of simplicity, permit me to offer a list of challenges that must be addressed to ensure long-term security of the sustainability of our land here at home. Obviously,

I can't cover all the big issues here—I won't say much about the problems of human population growth and global warming. Because of their magnitude, I must acknowledge their over-arching importance and the fact that they must be dealt with in a larger forum.

My list of challenges leans towards land management and issues I faced at both the Forest Service and Bureau of Land Management. I offer this list with sincerity, out of concern for how we as a nation act as stewards of our resources – for our own good and for the land that future generations will inherit.

1. Fresh water

Let's start with water – an issue I believe is one of the greatest threats to human security. The United Nations Economic Commission recently warned of a looming water crisis. The UN report stated that two in three people will face water shortages by 2025. In China, at least 400 cities are presently short of water. Mismanagement of existing water resources, population growth, and changing weather patterns are the primary causes.

Water is already a volatile issue in our country. In the arid Southwest, battles are brewing over the waters of the Colorado River, already badly depleted. The bottom line is there isn't enough to go around.

The Great Plains states, from the Dakotas to Texas, depend on the Ogallala Aquifer, the largest "water tank" in the U.S., which contains water that was deposited 10,000 years ago when the last great ice sheets melted. It is now 10 to 100 feet below earlier recorded levels. When it's gone, it's gone.

Closer to home, the Great Lakes contain 20% of the world's fresh surface water and 95% of the U.S. fresh surface water. Yet in the Chicago metropolitan area, mayors of the four larger suburbs have said they felt water was their biggest issue. This is on the shore of the 5th largest freshwater lake in the world where it rains some 30 inches per year.

Here in Wisconsin, named for its beautiful waters, the resource is not what it once was. Less than 7 percent of its waters are free from pollution. In urbanized areas, arsenic levels are rising because ground water is being withdrawn faster than nature can replace it. More than 3,500 dams alter stream flow and halt fish migration in streams across the state.

As Forest Service Chief, I gave a speech I called “The Forest Service: The World’s Largest Water Company.” That followed my conviction that we should manage our national forests first as watersheds, and then for other uses. This was not always a popular view, even among some of my own colleagues, but it seemed like a reasoned approach to me and I had to draw the line somewhere.

The cleanest water in the country flows off our forests. One-third of the U.S. is covered by forests that produce two-thirds of the run-off. Collectively, our public lands are by far the largest and perhaps most important water providers in the United States. The 192 million acres of national forests and grasslands alone provide drinking water to more than 60 million Americans living in some 3,400 communities in 33 states.

A few years ago, we knew the value of a board-foot of timber, a barrel of oil, and a ton of coal, but we didn’t know the value of the water. So a team of experts, led by Dr. Jim Sedell, went to work and found the marginal value of water from national forest lands to be more than \$3.7 billion per year. That does not include the savings to municipalities from reduced filtration costs.

The objective is to keep water on the land longer. Put simply, watersheds catch, store and release water over time. Our challenge is to restore watershed function: the interaction of the soil, water, and vegetation. I’m delighted that as agency leaders, you are gathered here to discuss together how to restore watersheds.

Given the fundamental importance of water to all life, watershed health and water quality should be the basic measures of success for our public lands managers.

2. Land fragmentation and sprawl as a threat to natural areas

Let's look at some rates of fragmentation:

An average of 3.2 million acres per year of forest, wetland, farmland, and open space were converted to urban uses between 1992 and 1997—an area about twice the size of Delaware. That's about 8,700 acres a day, more than double the rate of development of the previous decade, while the population remained relatively constant.

Even in cities with stable or declining population, sprawl occurs. The Detroit Urbanized Area's population, for example, actually declined by 7% from 1970 to 1990, yet its land area grew by 28%.

Sprawl is also occurring in remote areas. Large landholdings in northern Wisconsin are being fragmented and developed, resulting in "waterfront sprawl" which is creating urban runoff problems in these formerly remote forests. Most privately-owned waterfront property is subdivided into not only lake lots, but also back lots, as demand for this valuable property continually increases.

Land fragmentation increases as tract size diminishes. From 1978-1994, the proportion of private forest ownership of less than 50 acres nearly doubled. Thousands of larger parcels of land have been carved up into millions of smaller parcels. This trend brings real meaning to the familiar quote, "Buy land, they ain't making it anymore."

The frontier is not what it was. Our parks are being loved to death. Recreation on all public lands is growing rapidly, as private land is increasingly posted with "no trespassing" signs, making it off-limits to all but those with specific permission from the landowner. Thank goodness the public lands remain open to all, but we must not overuse or degrade them.

Decades ago, Aldo Leopold ventured a prediction: "Fifty years from now, the acquisition of public game lands may be recognized as a milestone in the evolution of democratic

government.” That prophecy came true. Americans cherish their public wildlands and parks as a major achievement of the United States in the twentieth century.

3. Loss of biodiversity

World-renowned Harvard biologist E. O. Wilson conservatively estimates that approximately 27,000 tropical forests species a year are being pushed to the brink of extinction. And the Center for Plant Conservation at the Missouri Botanical Garden estimates that 20 percent of all plants native to the United States are declining, threatened, or near extinction.

We are losing biodiversity at an alarming rate, a trend that must be reversed. Many wildlands serve as a biological refuge for native species, often their last refuge. Our national forests and grasslands, for example, contain 181 of the 327 watersheds identified by The Nature Conservancy as critical for the conservation of biodiversity in the United States. The National Forest System supports 366 species of plants and animals listed as threatened or endangered under the Endangered Species Act, plus another 2,800 sensitive species and numerous imperiled plant communities. High biodiversity enhances ecosystem stability, resistance to invasion by non-native species, and resilience.

If you haven't read the book, [The Future of Life](#), I recommend it. It is an easy read written by E. O. Wilson, the world-renowned expert on biodiversity.

In a spot overlooking the place where the Wisconsin and Mississippi rivers meet, Aldo Leopold spoke with eloquence and sadness to the planners of a passenger pigeon monument. He said, “There will always be pigeons in books and in museums, but these are effigies and images, dead to all hardships and to all delights. Book-pigeons cannot dive out of a cloud to make a deer run for cover, nor clap their wings in thunderous applause of mast-laden woods. ... They know no urge of seasons; they feel no kiss of sun, no lash of wind and weather. They live by not living at all.” To me, this quote says it all when it comes to preserving all life forms on Earth.

4. Exotic species

We've not only managed to diminish our ecological heritage, we've also rearranged it. The exotic species problem is an explosion in slow motion. I'm usually an optimist, but when it comes to controlling exotic species, the picture is bleak. I must cite some examples.

Invasive species now infest more than 100 million acres of American land and they are spreading at a rate of 3 million acres per year—that's an area equal to a strip of land two miles wide stretching from coast to coast!

Here are a few statistics that describe exotic plant occurrence as a percentage of the total flora in a few regions: 11% in the U.S., 44% in Hawaii, 43% in the British Isles, 27% in Florida, 30% in Wisconsin, and 30% in Canada. David Wilcove *et al.* (1998) reported that exotic species have played a significant causal role in the status of 49% of the species threatened with extinction in the United States. In comparison, they connect only 24% of imperiled organisms to pollution. Exotics are the leading threat to birds. The Union of Concerned Scientists estimates that about 7,000 invasive species of plants and animals are now established in the United States. The economic impact is significant. A select group of exotic organisms costs the United States \$138 billion per year in losses and control efforts.

The State of the Great Lakes 2001 Report by the EPA suggests that biological pollution is a more substantial threat than chemical pollution. Some scientists believe that only deforestation during the cut-and-run timber harvest era was as ecologically damaging as the spread of invasive species.

In this state, we have spotted knapweed, Eurasian water milfoil, garlic mustard, purple loosestrife, gypsy moth, hemlock wooly adelgid, only to mention a few. Today in Wisconsin, of the 2,406 "wild" plant species, 734 are non-native.

Leafy spurge has infested more than five million acres in 23 states, causing economic losses of some \$100 million annually. Yellow star thistle has spread to eight states and has infested more

than 12 million acres in California alone. Yellow star had to be removed from California's noxious weed list because by law, all noxious weeds on the state's official list must be treatable. Star thistle is just too far out of hand and not obeying the California law.

Dutch elm disease wiped out the majestic elms and changed the look of hundreds of cities and towns as it whipsawed across much the country. Chestnut blight killed that tree and changed the great eastern hardwood forest ecosystems forever. There are white pine blister rust, kudzu, and melaleuca in The Everglades, and a long and growing list of species displacing native rangeland plants. The impacts of the recently discovered Asian longhorn beetle remain unknown, but the insect's arrival has frightened foresters and anyone else who has paid attention. We do know it has already made its way into North America via the ports of New York and Chicago and that its effects will be bad—we just don't know how bad.

An unintended byproduct of our modern transportation systems and daily travel to every continent is that we are flying and shipping millions of organisms – bacteria, seeds, insects, plants, animals, name the life form – around the world on a daily basis to places they have never been. We have unknowingly fashioned a Pangaea, the ancient super-continent that included all of the Earth's major landmasses. At least in the biological sense, the natural processes of evolution have been tossed up in the air.

Managing exotics proves difficult because many of them thrive in disturbed habitats. Our best defense against exotics is to protect remaining undisturbed native habitats and maintain the natural biodiversity. And, yes, we do need effective import inspections and standards. We also need a science-based approach to exotics that helps us to look ahead and act accordingly, rather than try to corral the horse after it's out of the barn.

5. Old growth forests

One definition of old growth seems to be “senile trees that belong in a home, preferably as 2-by-4's or 2-by-6's.” More than any other issue, old growth symbolizes the National Forest

management conflict and controversy for the past 30 years. The basic question is: How many acres of our old growth forests do we want to keep?

Here in the Upper Midwest, we revere the tree that built America, *Pinus strobus*, the white pine. The white pine forests were leveled by the turn of the last century in the cut-and-run era. I wonder if we will ever have old growth white pine forest beyond the Menominee Tribal lands in Wisconsin again. Is there public support? Where? And how long will it take? Surely none of us living today will ever see the majestic white pine forests. I wonder if our great-grandchildren will.

I must also ask one last question: What in the world are we doing cutting old growth forests on public lands, or anyplace for that matter? It's time, past time, that we recognize the ecological and social values of these forests and leave them intact. The Bush Administration should immediately halt all commercial harvest of old growth forests on public lands. And here is why:

First, although no one knows exactly how much old growth remains, what's left is but a small fraction of what once was and will never be again. And what remains did not survive by accident. Most remaining old growth stands occur in the West in rugged terrain where the economic and environmental costs are simply too high.

Second, scientists increasingly appreciate old growth forests as reservoirs of biodiversity with associated "banks" of genetic material. It's time to stop fighting over what little old growth remains unprotected.

Third, a large and growing number of people want old growth forests preserved for posterity. Values associated with "beauty," "spirituality" or "connection with the past" are expressed in other terms applied to old growth such as "ancient" or "cathedral" forests. These values are as real as those determined for commodities in the marketplace and clearly exceed the values as timber.

Fourth, if the past is prologue, harvest of old growth will be publicly resisted in sequential and predictable steps—appeals, legal actions, protests and, in the end, civil disobedience. In the

Pacific Northwest, where most old growth remains, costs of making old growth timber sales are disproportionately high with very low chance of ultimate success.

Fifth, few sawmills remain in business that can process large old growth logs. The mills that have survived are geared to efficiently process smaller second-growth trees.

Sixth, and most important, the never-ending fight is draining time, money, energy and political capital needed to address more pressing problems.

The commercial harvest of old growth from public lands, and in fact all lands, should come to an end. That would be a lasting legacy – and a truly conservative one at that!

6. Off-road vehicles

Off-road vehicle use presents a huge challenge for public lands managers. We have more people going more places on public lands more often, with more kinds of all-terrain vehicles, than ever before. Many people want to go anywhere anytime with anything, regardless of the impact on the land, water, vegetation or wildlife. As both Forest Service Chief and Bureau of Land Management Director, I had many field managers say this was their most difficult challenge. The use of off-road vehicles in the national forests alone increased from 5 million users in 1972 to 36 million in 2002.

I recall a conversation with a conservative Western senator who didn't want me to take on the issue. I asked him if he knew any ranchers or private landowners who let anybody who wanted to go anywhere anytime with anything. The answer was no.

Bringing support, order, and agreement to the use of all-terrain vehicles on public lands will be exceedingly difficult and controversial. It will make the spotted owl issue look easy. But if the agencies and community of interests do not take it on, it will likely be thrown to the courts. Isn't leadership all about not shying away from difficult issues? I commend Forest Service Chief Bosworth for taking on this tough issue. Solutions will not come easy. But whatever

mechanisms we use to resolve the off-road vehicle use issue, most important is this: all of our activities must take place within the ecological limits of the land.

7. Private land conservation

Private land conservation as a component of public lands conservation? The two are inextricably linked, and few areas offer more promise for conservation and watershed restoration than the many millions of acres of privately-owned land in the United States.

For example, about two thirds of the forests in the United States – some 490 million acres – are in non-federal ownership. This includes more than 9 million woodland owners who own tracts of land less than 100 acres. Of these, only about 5% have professionally-developed science-based management plans.

According to a 1996 National Research Council report, we have more than 20 million acres of forest classified as urban and community forests and more than 60 million acres of cities and towns sprawling over what once was forestland. The opportunities are tremendous.

Research done by Dr. Greg McPherson and his colleagues in California at the Center for Urban Forest Research reported that there are some 177 million trees in energy-conserving locations. This saves California utilities \$500 million annually in wholesale electricity purchase and generation costs. These trees save consumers about \$1 billion in air conditioning. McPherson's models predict that if Californians planted 50 million more shade trees in strategic locations, the energy saved would be equivalent to seven 100-megawatt power plants.

The Forest Service estimates that we can plant another 700 million trees in our cities and towns across this country. In energy terms, combined with existing trees, this is equivalent to 30% of the estimated annual oil production of ANWR averaged over 50 years.

Shouldn't a national energy strategy put the greening of our cities and towns with tree planting ahead of, or at least on par with, drilling for oil on sensitive lands? Urban and suburban

reforestation should be at the forefront of international policies and treaties. Trees not only produce oxygen we breathe, but also sequester carbon, which reduces global warming. Trees also reduce storm water runoff, which saves money and improves water quality. Trees improve the looks and livability of our urban communities and help connect people to nature in the places where nature is needed most, the places where people live. Any national energy policy that doesn't have tree planting front and center is incomplete.

8. Ecological literacy

I mention ecological literacy last because it serves as the most important tool for achieving good regarding the eight challenges we've just reviewed. That is one of the reasons I came back home and to UW-Stevens Point to join the GEM Education Center. We need to help all citizens and landowners understand and appreciate the full spectrum of what the land does for us - both as a component of our own national security, and for the good of the world.

Today, a greater proportion of humans than ever before is living farther removed from the land. Eighty percent of the U.S. population is urban or living in cities and towns. Our challenge is helping people reconnect with nature.

We must connect peoples' hearts and minds with the land and the outdoors. And that doesn't mean that they have to live in the woods or out on the prairie. Rather, it means that regardless of where people live, they need to understand and appreciate the land that sustains us.

A recent study by conservation policy analyst Neil Sampson showed that the proportion of the federal budget allocated for natural resources is 50 percent of what it was in 1962. In the corporate world, that would be a near-fatal loss in market share. It is most surely an indictment of public education efforts, or the lack of them, on behalf of our precious natural resources.

We must make investments in the land for the long haul. We must build support for good land management. It's the patriotic thing to do. Not one of us wants future generations to look back

at our time and ask, “Why did they use the land up?” Education, understanding and appreciation are keys to maintaining our quality of life over the long haul.

Reflections on the past

If you haven't read “Conquest of the Land through 7,000 Years”, by W.C. Lowdermilk, former Assistant Chief of the Soil Conservation Service, I recommend it. It's USDA Bulletin No. 99, published in 1953. It is a chronicle of Dr. Lowdermilk's research in the late 1930s when he traveled around the world asking why many once-great civilizations had failed. He concludes that mismanagement of soil and water was a major factor.

I think Theodore Roosevelt said it best when he proclaimed that, “A nation that destroys its soils destroys itself...” If he were alive today, I'm sure he would extend that comment to, “A nation that destroys its soils, [dirties its water and air, and destroys its biodiversity] destroys itself...”

If we truly want a future free from threats to our security, we must think seriously about what constitutes a threat to our freedom and quality of life. We also need to ask ourselves as we spend billions of dollars and incalculable hours addressing the threats from the likes of Saddam Hussein and Osama Bin Laden, are we not making a mistake by ignoring threats to our land, air, food and water...threats that historically have toppled more civilizations than either of these two men could ever dream of? Without environmental security that ensures the basic sustainability of the land, the other pursuits are irrelevant.

We should not ignore the threats of terrorists and dictators. But on the other hand, will we be truly secure when our borders have been sealed tight from terrorists, but the water our children drink is growing scarce, the air we breathe is dirty and the lands we live on and need to survive are sick? I think the answer to that question lies in the whisper of the sand that blows through the ancient ruins of Iraq.

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