



# A Looming Crisis

## IN THE SUPPLY OF LAND MANAGERS?

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A perfect storm is coming in the supply of college-educated, skilled land managers. Baby boomers—those born between 1946 and 1964, who make up one-third of the current U.S. population—are retiring in record numbers from state and federal land management agencies, non-governmental organizations (NGOs), universities, and private natural resource industries. This is happening at the same time that enrollment in natural resource programs at our colleges and universities are falling—and have been since the late 1990s.

**BACKGROUND IMAGE:** Student practicing stream habitat measurement techniques at the U.S. Fish and Wildlife Service's National Conservation Training Center.

## From Boom to Bust

What is happening? The 1960s were the boom years in the education and production of natural resource professionals. Surprising to many, Richard Nixon is often considered to have had the second most conservation-oriented presidential administration—second, of course, to that of Theodore Roosevelt. During the Nixon administration, the Clean Air Act, Clean Water Act, National Environmental Protection Act (NEPA), and the Endangered Species Act were passed, and the Environmental Protection Agency (EPA) was formed. College-bound youth, still responding to President John Kennedy's challenge to "Ask not what your country can do for you, but what you can do for your country," responded by enrolling in natural resource curricula in droves. Enrollments at universities no doubt also benefitted from young adults seeking "S-2" college deferments from the draft and an all-expense-paid trip to Vietnam. Funding for the U.S. Fish and Wildlife Service (FWS), the U.S. Forest Service (USFS), the Soil Conservation Service (now the Natural Resources Conservation Service—NRCS) and the Bureau of Land Management (BLM) were good. The agencies expanded their hiring to deal with the new regulations and responsibilities, while universities opened new academic programs and hired more faculty to deal with the influx of students. The profession of natural resource science and management prospered.

In recent years, however, these Baby Boomer wildlife biologists, range managers, and foresters began reaching the retirement age. If you entered the profession with a B.S. or M.S. between the ages of about 22 and 27 in the mid-60s, then spent 30 years in state or federal service or in the private sector, you could quite likely retire by age 55. For many, that was about the late-90s to the early 2000s. In fact, by 2007, 61 percent of the program managers in the Department of Interior were eligible for retirement. That same year, half of the senior executive service members of the Interior, the USFS and the EPA could retire. The USFS anticipates losing 81 percent of its entomologists and nearly half of its foresters. The EPA is losing 45 percent of its toxicologists and 30 percent of its environmental specialists. The Bureau of Land Management, the National Park Service, and the Natural Resources Conservation Service (NRCS) are in similar shape. These federal employees are not just bureaucrats and regulators—they are the field biologists and land managers of our public lands. An identical trend is happening

in the state fish and game agencies, in private timber companies, and on ranches with wildlife managers.

This would not be a problem if the nation's universities were churning out foresters, soil scientists, rangeland managers, and wildlife biologists with bachelor's, master's and doctorate degrees that are needed. But they are not. Enrollments in natural resource fields at our nation's colleges have been in steep decline since the late 1990s. Enrollments have dropped a full 33 percent since then. Professor Terry Sharik and his colleagues at Utah State University have tracked both national and regional data on these enrollments for the National Association of University Forest Resource Programs (NAUFRP). There have been declines in students studying forestry, range management, soil science, watershed management, wildlife and fisheries, and general natural resources. These trends follow

similar declining trends in enrollments in production agriculture, like agronomy, entomology, plant pathology, crop science, and agricultural education. Agriculture deans report that most of their current animal science students are either horse enthusiasts or dog/cat lovers who want to become veterinarians. Ag colleges that have biochemistry programs, or who have developed degrees like forensic entomology, or biological engineering have done better at maintaining enrollments by attracting pre-medical and biotechnology students. But these students won't help farmers and ranchers. In natural resource programs, enrollments have increased in recreation, tourism, and park management.

Natural resource programs have responded by "sexing up" traditional degrees into ones called environmental soil science, restoration ecology, evolutionary biology and conservation biology. One of the problems with the shifting disciplines is that the new areas tend to be more general, more theoretical and less applied, and have fewer field experiences. David Blockstein, senior

scientist at the National Council of Science and the Environment, has stated, "We have a disciplinary shift from traditional natural resource fields to newer fields like conservation biology and environmental studies."

The result of this, states Maxine Levin of the NRCS, is that "Environmental programs with no soil science, chemistry, math, or engineering have produced excellent future lawyers and activists, but not individuals who have the skill sets to do objective, science-based conservation planning with farmers, landowners, developers, engineers and regional land planners."

## Factors at Work

Why aren't students enrolling in traditional natural resource programs? Certainly low salaries and a lack of hiring over the past couple of decades is part of the answer. The lack of diversity, the impression that these fields are not "female-friendly,"

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and the lack of marketing have all had their impact on student interest. Another is that our society has urbanized. Great granddad may have had a farm or ranch, but that family place in the country is long gone. The current "echo generation," and their parents, the "millennial generation" before them, have little connection with the outdoors. Youth are surrounded by the instant gratification that comes from TV, cell phones, Blackberrys, the internet, iPhones, FaceBook, YouTube, and Twitter. As Richard Louv stated in his book, *Last Child in the Woods: Saving our Children from Nature Deficit Disorder*, "...the physical contact, their intimacy with nature on a day-to-day basis, is fading. I believe our society is teaching young people to avoid direct experience with nature." At the same time, our middle and high schools are continuing to fall behind other countries in science and math. This was reported as early as 1983 in the National Academy of Science (NAS) report, *A Nation at Risk*, and more recently by another NAS report, *Rising Above the Gathering Storm*. The



failure of our schools and our homes to promote science and the fact that kids today actually spend more time watching TV and playing video games than they spend

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in school has led Bill Gates to state, “... our schools are obsolete. They cannot teach kids what they need to know.” This of course follows into college, where students eschew science and natural resource degrees, and now over a third of natural resource doctorates are awarded to foreign students.

An additional problem in the supply of skilled resource managers is the type of education needed versus that provided at our natural resource colleges. In the 1960s,

most of our natural resource undergraduates came from rural areas. Most were hunters and knew how to drive tractors and perhaps cut timber or drive cattle. Today’s urban students

are just as passionate about wildlife and the woods, but they may not be hunters or fishers, and they may not have even spent much time out of doors. They got their interest and attitudes about wildlife and the outdoors from the Discovery Channel.

I’ve heard them called “green couch potatoes.” I recall 10 years ago meeting with the employers of our Texas A&M wildlife graduates.

The employers said, “these students need to know what we knew when we graduated in the 60s and 70s but also they

need to know about statistics, GPS and GIS applications, computer modeling of habitat and wildlife populations, endangered species regulations, conflict resolution, budgeting, personnel management, and how to use a chain saw and back a boat trailer.” This reflects the complexity

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of a modern natural resources career. There is pressure across the U.S. to reduce all bachelor's degrees to 120 credits, to get students out the door faster and alleviate the need to build more classroom buildings and labs. Natural resource programs have instituted internship programs, more field trips, labs and summer camps to provide the practical education our students need and our employers want. But, it is a challenge to produce a "society-ready" graduate in four years.

The current downturn in the economy has added a new kink to the problem. For a while, the anticipated flurry of retirements was delayed. The Boomers born in 1946, who entered the profession at about age 25, hit retirement age with 30 years of government or industry service in 2001, during a recession. Those who could, stayed in their jobs a few more years until things got better. Then they started retiring in droves from about 2003 to the present. The retirements may be slowing down again right now, but remember that most agency personnel retire on guaranteed pensions, rather than on personal savings accounts, IRAs or 401k accounts. According to Ann Bartuska, deputy chief of the U.S. Forest Service, her agency is losing about 4,000 professional employees per year right now. Due to the downturn in the economy, they are only able to replace about 2,500 per year. Other federal and state agencies, timber companies, NGOs and other land management organizations are in the same boat.

## Surviving the "Perfect Storm"

Employers and the universities have seen this "perfect storm" coming for some time. The Brandywein Institute held a national Conservation Learning Summit on this topic in 2006. National Association of University Forest Resources Program has hosted both national and regional meetings since then to discuss enrollment trends and recruiting possibilities. The Association of Fish and Wildlife Agencies has produced a "Conservation Education Agenda" for state agencies. Richard Louv's book sparked a "Children's Nature Network" of family-level nature clubs around the country. Boy Scouts, Girl Scouts, 4-H, Boys and Girls Clubs, and other organizations still promote out-of-doors activities, as do the teachers of Project WILD and Project Learning Tree. Hunting and conservation organizations such as Ducks Unlimited, Quail Unlimited, the National Wildlife Turkey Federation, and of course our own Boone & Crockett Club all have youth programs. Simultaneously, state and federal programs like No Child Left Behind

have poured funding into science and math programs into our schools with varying success.

Universities have responded by increasing marketing and recruiting efforts. Oregon State University conducted surveys and focus groups with high school students. They found an interest in the outdoors and the use of electronics gadgets (like GPS units or radio telemetry), and a desire to "make a difference." They even produced a DVD to send to prospective students. Other colleges are putting up billboards with photos of students in the woods spending "another day at the office." The University of Tennessee and Oregon State University have offered introductory college-level wildlife courses via distance education to high school students. North Carolina State University has begun recruiting at Camp LeJeune and Fort Bragg, where thousands of veterans of the wars in Iraq and Afghanistan will be returning (the number is expected to double this summer) and eligible to use the new G.I. Bill.

Despite these efforts, we can expect a shortage of trained land managers for the next several years. As our economy improves, there will be a hiring frenzy to replace those who have retired, and there will be a shortage of replacements. Perhaps the market will drive up salaries to make natural resources a more attractive career. There will continue to be a particular shortage of people with specialty degrees—like those in forest entomology, range hydrology, or water law. All of this does not bode well for the conservation of our national wild lands, both public and private. It does, however, emphasize the importance of our Boone and Crockett Club professorship, fellowship and research programs. A quick look at the Club's web page and newsletter will inform you of the current programs at the University of Montana, Oregon State University, Texas A&M University, the University of Michigan, and developing programs at Colorado State University and the University of Wisconsin-Stevens Point. The training of our future wildlife and natural resource professionals—in terms of numbers, quality, diversity, and applied skills—will be paramount to the future of our nation's landscape. ■

## B&C UNIVERSITY PROGRAMS

University programs are the Club's most significant, enduring influence on the future of wildlife science and policy. The Club currently has affiliated programs at the University of Montana, Texas A&M, Oregon State, and Michigan State universities. Following is a list of the 14 graduate B&C Fellows at the University of Montana, Texas A&M, and Oregon State.

## UNIVERSITY OF MONTANA FELLOWS

**Jami Belt** - Using citizen science to estimate mountain goat populations in Glacier National Park

National Park

**Jonathan Derbridge** - Diets of wolves in Northwestern Montana

**Michel Kohl** - The

importance of water for

bison in Northcentral Montana

**Jerod Merkle** - Black bears in urban areas: resource selection, conflicts, and human attitudes

**Sonja Smith** - Sexual segregation in mule deer

**Jeffrey Wright** - Behavior and impacts of bison and cattle on the shortgrass prairie

## TEXAS A&M FELLOWS

**Andrea Feldpausch-Parker** - Communicating Climate Change: A Case Study of the U.S. Department of Energy's Carbon Sequestration Program

**Damon Hall** - Energy Technology Diffusion Policy at the State-level

**Cristi Horton** - Yellowstone River Cultural Inventory

**Mike Liles** - International public participation practices for

conservation: A case study on El Salvador's eastern Pacific hawksbill turtle

**Anna Munoz** - The Edwards Aquifer Recovery Implementation Program: Opportunities, Constraints, and Considerations in the use of Collaborative Decision-making for Addressing Endangered Species Conflict

**Leigh Bernacchi** - In Commonness is the Preservation of the Bird: Citizen Science, Climate Change and Birds

**Chara Ragland** - Energy Technology Diffusion Policy at the State-level

## OREGON STATE FELLOW

**Cristina Eisenberg** - Trophic Cascades Involving Humans, Wolves, Elk, and Aspen in the Crown of the Continent Ecosystem

