100 YEARS OF EXPERIMENTAL FORESTS and eons of tinkering

BY DOUG CRANDALL

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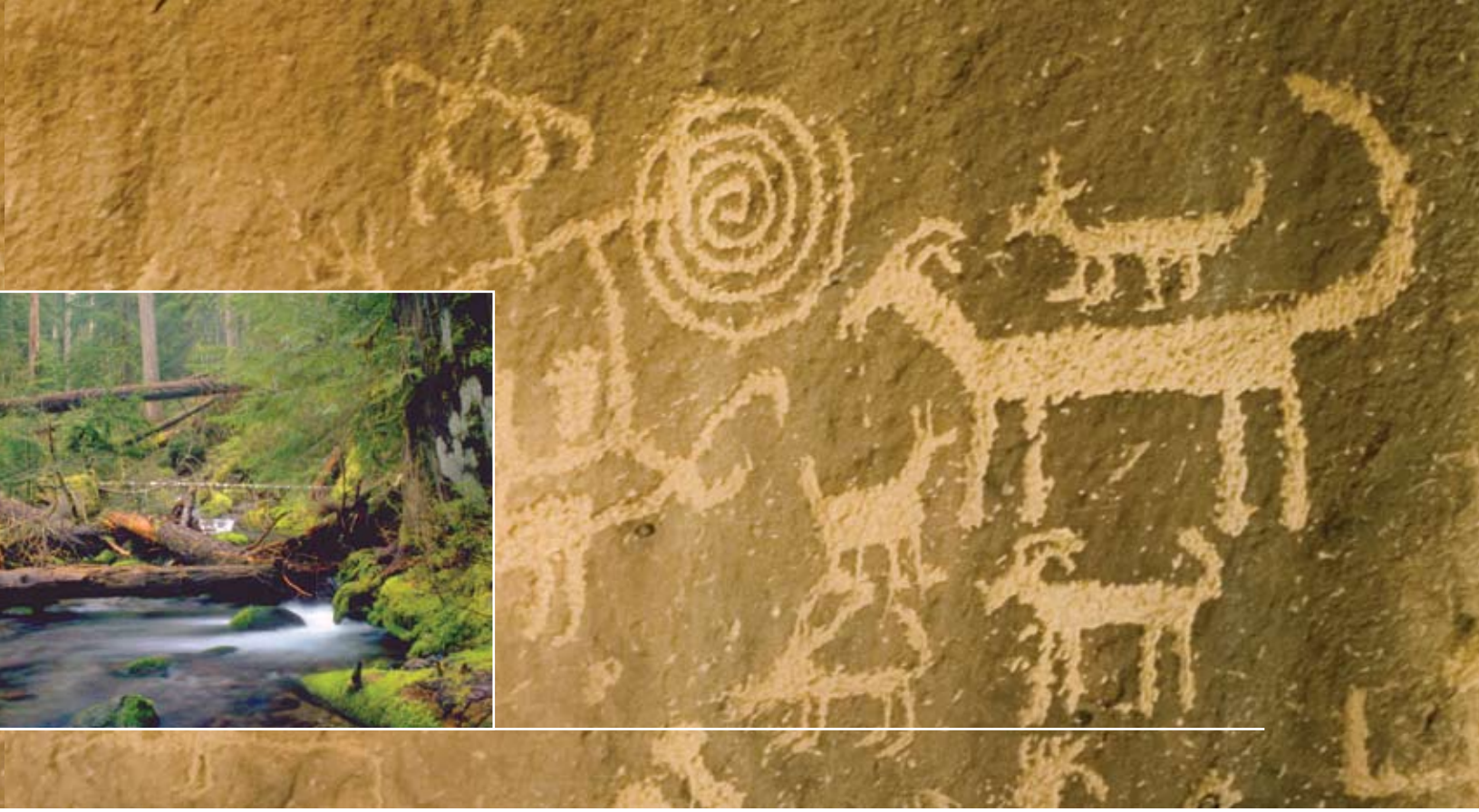
Since humans first set foot on American soil about 15,000 years ago, forest management has been a way of life. These Asian immigrants brought with them a vast knowledge of ways to manipulate forests (including the use of fire) and make them a source of food, shelter, medicine, bedding, tools, weapons, and a host of other essential uses.

Dense, closed forests provided little for these paleoindians in terms of food; the grasses, shrubs, and forbs they needed for themselves and for wild game were more available in open forests, as were trees and shrubs that produced nuts, acorns, and berries. These intelligent and creative people used fire to thin and open dense stands. Evidence shows few, if any, landscapes unaffected by paleoindian fire.

The structure and makeup of American forests first viewed by Europeans were greatly impacted by, and to a great extent the result of, intentional manipulation by Native Americans. Many Europeans learned the value of these techniques. The founder of the Rhode Island colony, Roger Williams, documented this observation of native forest management: "This burning of the wood to them they count a benefit, both for destroying of vermin, and keeping down the weeds and thickets."

European settlement had its own impact on forests, largely in the form of their removal for agriculture, fuelwood, and building materials. The story of the decline of American forests, particularly in the East, as well as their recovery, has been well documented since 1900, following the birth of the modern conservation movement. A key element of that movement was the emphasis on, and growth in, the forest sciences. This is indicated in part through the increase in number of forestry schools. Only two colleges offered forestry curricula in 1900, but by 1915 there were 13. In addition, the advancement of science in forestry became one of the objectives tied to the creation and management of the nation's forest reserves.



EXPERIMENTAL FORESTS

Shortly after President Roosevelt created the USDA Forest Service in 1905 and placed it under the supervision of his friend Gifford Pinchot, the agency's first chief, the department worked to establish experimental forests. In August of 1908, Raphael Zon, the first chief of silvics, planted a ceremonial tree at the initial experiment station at Fort Valley in Arizona, saying, "Here we shall plant the tree of research." One hundred years later, the Forest Service manages more than 80 experimental forests and ranges for the purpose of conducting applied research—living laboratories where long-term science and management studies can be done on all of the nation's major vegetation types. Among them are tropical forests (Luquillo Experimental Forest in Puerto Rico), boreal (Bonanza Creek Experimental Forest in Alaska), semi-arid chaparral (San Dimas Experimental Forest in California), and peat-bog deciduous (Marcell Experimental Forest in Minnesota). The experimental forests range from small units (116-acre Kawishiwi Experimental Forest in Minnesota) to large (55,600-acre Desert Experimental Range in Utah).

Many important scientific and policy advances have been made at these sites. Some examples are:

- The Wind River Experimental Forest in Washington was crucial in addressing reforestation needs following extensive logging and major fire events in Douglas fir forests of the Northwest during the first half of the 20th century. As a result, millions of acres were successfully regenerated.

- A primary management tool for achieving the important ecological task of reintroducing native longleaf pine forests in the South was developed at the Escambia Experimental Forest in Alabama.

- Many rangeland restoration methods widely used today were developed through grazing studies on the Great Basin Experimental Range in Utah.

- The Calhoun Experimental Forest in South Carolina was created from lands that had been severely degraded by extensive cotton and tobacco farming. Considered the "worst of the worst," this site provided a perfect laboratory for focused and highly successful, long-term research on soil improvement.

- The first documentation of acid rain in North America took place at the Hubbard Brooks Experimental Forest in New Hampshire, where some of the first and most complete, long-term watershed and hydrologic studies have been done and continue to be undertaken.

The research done at these locations has typically been long-term and of a collaborative nature engaging univer-

sities, government agencies, tribal governments, private industry, private landowners, conservation groups, and other forest scientists from around the world. These forests continue to contribute to issues of relevance, such as invasive plants, insects and disease, global climate change, watershed function, and recovery after natural disturbances.

CHALLENGES

All of this is good and, in its centennial year, worthy of celebration; but there are some problems—or as we are urged to say in the government vernacular, there are "challenges."

The short list includes aging infrastructure, unstable funding streams, political meddling, and bureaucratic weight. But probably most troubling is that the ability to do cutting-edge research is diminished on these federal lands because of the same regulatory congestion that restricts management on the rest of the federal landscape. Just to do basic research, the agency is required to spend huge amounts of time and money to produce volumes of procedural documentation required for compliance with the National Environmental Policy Act, the Endangered Species Act, the Administrative Procedures Act, the National Forest Management Act, the American Antiquities Act, the Clean Water Act, and a host of other laws. Ironically, Congress passed each of these laws individually with the intent of protecting the environment, but collectively their overlapping and sometimes contradictory requirements have become a barrier to the efficient accomplishment of some of the basic research needed to help find solutions to important ecological problems.

An additional consequence of this gridlock is to push some of the most important research onto non-federal lands where work can proceed more economically and effectively. This would be fine except that the best areas for doing this type of research often fall within the 193 million acres of national forest. The diversity of landscapes and the amount of available land for "control" sites are unmatched.

Even more disconcerting is that because of the legal/political stalemate tying up management decisions on federal lands, little of the cutting-edge science being developed by the Forest Service can actually be applied on Forest Service lands. Fortunately, however, this research is helping to advise the management of state, private, and tribal lands, and forests and grasslands in other countries.

KNOWLEDGE

The advent of the scientific method has created an exponential increase in the knowledge base available for making informed decisions in every aspect of our lives; forestry is no exception. And experimental forests have played a key role in this regard during the first century of their existence. The knowledge created at these experimental

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forests is not a replacement of, it is in addition to and an improvement on, the knowledge that was built over eons of human interaction with forests. The cumulative result is that our abilities to manage forests for a host of ecological and economic values have increased dramatically and will continue to improve as long as we continue to fund and promote basic forest research.

The thoughtful utilization of experimental forests needs to remain a key element. To do this, it will be necessary to address the legal/regulatory framework that is limiting the ability of these forests to provide the amount and quality of research for which they are reasonably capable. One suggestion is for Congress to charter a "blue ribbon" panel of forest scientists and managers for the purpose of analyzing these issues and developing recommendations. Recently, some of the higher profile versions of this type of panel have been the Iraq Study Group and the Base Realignment and Closure Commission. A more direct correlation could be made to the Public Land Law Review Commission, passed by Congress and signed into law by President Johnson in 1964.

The charge of the commission was to make a comprehensive review of the public land laws and the rules, regulations, policies, and practices of federal, state and local governments, and to recommend any necessary modifications and prepare a final report. The commission's 1970 report, "One Third of the Nation's Land," paved the way for the eventual enactment of the Federal Land Policy and Management Act and the National Forest Management Act. Given the recent centennial of the USDA Forest Service in 2005 and this year's Experimental Forests' centennial, perhaps the time is right to convene a similar panel to analyze the effectiveness of today's federal regulatory landscape.

Finally, we need to remember that these experimental forests were established primarily for conducting applied research to better inform the management of our forests and rangelands. Applied research requires changing the environment to understand the environment—this is the essence of experimentation. Excessive regulatory restrictions that impede experimentation are simply bad for the long-term health, productivity, and sustainability of our forests.

In an era where tens of millions of acres of federal lands are at high risk of catastrophic fire due to unnaturally high concentrations of brush, dead trees, and other hazardous fuels, now would be a good time to apply that knowledge to the management of larger segments of our federal landscape.

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