

A Special Issue of the Journal of Forestry— Tribal Forest Management: Innovations for Sustainable Forest Management

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Native American forests and tribal forest management practices have sustained indigenous communities, economies, and resources for millennia. These systems provide a wealth of knowledge and successful applications of long-term environmental stewardship and integrated, sustainable forest management. Tribal forestry has received an increasing amount of attention from forest managers, academics, and tribal communities in recent years. Tribal forestry is seen as a way to provide approaches for solving our most complex social, economic, and environmental issues facing natural resource managers today. It is also considered as an important approach to build landscape-level partnerships and leverage funding for landscape-scale management. Tribal forest management provides numerous examples of balancing complex, multiple objectives in an era of shrinking budgets, novel ecologic interactions, and increasing human demands on our natural resources. This special issue of the *Journal of Forestry* seeks to capture a broad range of forest management practices occurring in Indian Country and beyond; to increase general recognition of the role that tribal forest plays in the greater landscape; and to engage broad audiences regarding the value of tribal forests and how they can serve as models for sustainability, integrated management, resilience, and restoration.

Tribal forest and natural resource management is multifaceted. Forests are managed for timber production that supplies tribal and nontribal sawmills. Forests are managed for spiritual and cultural values, but they are also managed using cutting-edge and novel management techniques. Tribal forests are managed to maintain diversity of species, respect culturally important landscapes, mitigate the negative effects of wildland fire, and protect water resources.

Every tribe is unique, has a different history, holds multiple levels of cultural perspectives, and is internally diverse. Tribes also vary in how their forests are managed; in some cases, tribes manage their forests with minimal involvement from the Bureau of Indian Affairs Division of Forestry and Wildland Fire Management (BIA Forestry).

In other cases, BIA Forestry provides the majority of staff and funding for forestry operations. Other tribes are somewhere in the middle with a mix of BIA Forestry and tribal employees and resources. BIA Forestry is the US government agency responsible for the federal trust responsibility to sustainably and productively manage tribal forests (US Congress 1994) whereas other federal land management agencies have trust responsibilities and treaty obligations on lands they manage. These relationships have sometimes led to differences in perspectives among tribes, BIA Forestry, and other federal agencies as to what is sustainable and what is the best productive use. The papers in this special issue are written with this as a backdrop.

Readers of the *Journal of Forestry* will appreciate this special issue for several reasons. First, there is an increasing desire to manage forests at a landscape scale. This necessitates working with multiple land management entities including American Indian tribes. There are 567 federally recognized tribes in the United States (Bureau of Indian Affairs 2017) and more than 300 tribes manage more than 18 million acres of forestland (Gordon et al. 2013). There are also nearly 4,000 miles of shared borders with US Forest Service lands alone (US Forest Service 2014). In addition, federal land managers have legal requirements to consult with tribes in their management.

We received an incredible response from foresters and academics across the country to our call for papers and received several dozen submissions, of which 24 were accepted and compiled into this special issue. Although it is not possible to have articles on every project, innovation, and aspect of tribal forest management, we believe that this special issue provides a range of papers that will be useful for foresters, land managers, and individuals interested in tribal natural resource management. We grouped papers into subsections, but given the holistic perspective of tribal forestry programs, we recognize that there is great overlap among each article's themes, ideas, and research. Subsections include tribal forests and management, silviculture and forest management techniques, collaboration and partnership, cultural keystone species management, and education.

Tribal forest management is developing innovative solutions to shared land management problems such as fire risks, invasive species, and models for sustainable forest management. Articles by Corrao and Andringa, Lake and colleagues, Morishima and Mason, Motanic, and Sessions and colleagues each highlight that tribal forests, tribal forest management, and tribal perspectives can serve as exam-

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ples of the sustainable forest management needed to solve our myriad problems. Mausel and colleagues describe the legacy and future of our nation's first sustained yield forest on the Menominee Nation's reservation, and Sasatani and colleagues outline the perceived value of voluntary certification programs for Native American forest products.

Specific examples of silviculture techniques, timber stand improvement, and other management tools form the second section of this special issue to give foresters practical examples and ideas. Hoyt and colleagues look at southwestern dwarf mistletoe impacts on Ponderosa pine, Singleton and Oblinger discuss western white pine and blister rust pruning, Bardon and colleagues test ways to improve red elm germination, Dey and colleagues describe the yield potential and value of high-quality sugar maple, Vales and colleagues describe a nutrition-based approach for managing elk habitat, and Kern and colleagues describe research into gap sizes and outcomes for managing northern hardwood forests.

The third subsection includes papers focused on the management of cultural keystone species. This is exemplified in Long and Goode's "Picture the Past" discussion that illustrates the cultural continuity of black oak acorn collection and management. Long and colleagues' article on black oak restoration shows the cultural importance of ecological restoration for tribal communities in California. Costanza and colleagues review black ash ecology, silvics, and management and its heightened importance to tribal communities because of threats from invasive species.

Several articles describe how collaborative partnerships are critical to achieving both tribal and federal land management as exemplified in Hatcher and colleagues' article on the Klamath Tribes and US Forest Service partnership, Hays' article discusses a unique collaboration between the Mescalero Apache Nation and the US Forest Service, Journey and colleagues' article describes part-

nerships between tribes and the National Forests of Arkansas and Oklahoma, Lucero and Tamez discuss collaboration and the implementation of the 2004 Tribal Forest Protection Act, and finally, Alexander and colleagues' article discusses how working across cultures in California has supported invasive species management for natural and cultural resources. These articles illustrate that partnerships for natural resource management are important for the future and give us models to emulate while highlighting pitfalls to avoid.

The final subsection is on education, and here several articles explicitly describe education as a way to engage tribal youth, enhance natural resource management, and develop a cadre of future natural resource managers. A tribal youth mentorship program in Maine that has successfully increased university enrollment is described by Carr and colleagues. Hoagland and colleagues show how tribal lands can be used to enhance university education for all students. Finally, Gervais and colleagues describe Native American student perspectives of natural resources in higher education and provide recommendations for improving Native American student retention and university practices for Indian students.

To further aid readers, it is helpful to discuss terms used in this special issue. First, individual authors used their own terms throughout this special issue; however, in general, *Native American*, *Indian*, *tribe*, *tribal*, and *indigenous* are the most inclusive terms and typically refer broadly to the original inhabitants of these lands. This can include people from federally recognized tribes, state-recognized tribes, or tribal descendants. *American Indian* is often more specific and is typically used to indicate federally recognized tribes or individuals of federally recognized tribes. *Alaska Native* and *Pacific Islander* also have specific federal and legal meanings, but they are emphasized to lesser extent in this issue.

We hope that this special issue raises awareness of the range of forest management

happening in tribal forestry today. By broadening perspectives, understanding, and knowledge of tribal forest management, we hope that this special issue lays the groundwork for future collaboration, partnerships, and improved forest management on tribal and nontribal lands alike. The authors are thankful for the stewardship that tribes have engaged in over millennia. They are also thankful to their tribal partners and the *Journal of Forestry* editors and staff who helped compile this important collection of papers. Funding for this special issue was provided through a partnership between the US Forest Service and the Society of American Foresters.

Supplemental Podcast

This article includes a podcast interview. Visit the online version of this article to listen to the podcast.

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