

# Indicator 7.50:

U.S. Forest Sustainability Indicators <https://www.fs.fed.us/research/sustain/>

## Programs, services, and other resources supporting the sustainable management of forests

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October 3, 2018

### What is the indicator and why is it important?

Sustainable forest management requires a broad range of well-trained practitioners, scientists, educators, extensionists, and other professionals across multiple disciplines working in government, academia, nongovernmental organizations, and the private sector. Forest sustainability benefits from education, technology transfer, and other programs and services, as well as from sufficient and sound infrastructure—buildings, roads, utilities, communications, etc., for the protection, production, and delivery of forest goods and services. This indicator provides information on the capacity of the public and private sectors to deliver programs and services, to access financial and human resources, and to maintain and develop infrastructure necessary for sustaining forests.

### What does the indicator show?

Forestry education and training programs are extensive throughout much of the United States. Land-grant universities and community colleges, as well as two private universities, provide most of the college-level forestry education and training in the United States. As of 2016, 53 U.S. universities had Bachelor of Science or Master of Science forestry degree programs accredited by the Society of American Foresters (SAF). These SAF-accredited programs included more than 1,200 forestry professors in 2016 (see Indicator 7.51). In addition, the SAF accredited 21 programs in forest technology.

According to a 2015 study, forestry programs in the 67 member institutions of the National Association of University Forest Resources Programs (NAUFRP) enrolled

3,885 undergraduate students in 2012. At that time, fisheries and wildlife programs enrolled more than 7,300 undergraduate students and natural resource conservation and management programs another 4,750. Over the last 30 years or so, increasing numbers of students enrolled in natural resources and fisheries and wildlife programs in the United States, but fewer students enrolled in forest management degree programs (fig. 50-1). These trends demonstrate a shift in focus from traditional production-oriented natural resource fields, like forestry, to more interdisciplinary and ecosystem-based programs, at least at the undergraduate level.

Certified forester programs also support sustainable forestry in the United States. The SAF offers a Certified Forester program, which listed about 2,000 certified and candidate certified foresters in 2016. The program distribution reported in 2009 included forestry consultants (25 percent), private industry (24 percent), State and local government (19 percent), Federal Government (9 percent), college/university (7 percent), retired (7 percent), and other (9 percent). Providing other related programs and services, the Association of Consulting Foresters (ACF), listed 651 certified consultants in 2014, and The Wildlife Society (TWS) reported about 1,300 Certified Wildlife Biologists and 300 Associate Wildlife Biologists in 2016. Additionally, 12 States require a license to practice forestry, and four more require forester registration, altogether comprising several thousand State-licensed and registered foresters across the United States.

Most of the SAF-accredited universities and NAUFRP member institutions provide continuing professional education for foresters and offer education programs for forest landowners, other professionals, and the public as well. The SAF, ACF, TWS, and State forester registration laws all require some level of continuing forestry education. Most States also have forestry or logging

associations with professional and technical training programs. Nongovernmental organizations also provide forestry education and training in the United States. For example, the Sustainable Forestry Initiative (SFI) supports multistakeholder implementation committees at various levels (e.g., State, provincial, regional) to promote the SFI forest standard, provide public information and education on sustainable forest management, and advance sound forest practices on the ground.

Partial statistics of the number of people who work for Federal or State agencies, or who are members of the SAF or ACF provide an indicator of the trends in support provided by forest-related professions over time (table 50-1). The U.S. Department of Agriculture, Forest Service—the country’s largest forest-associated employer—had a total of 38,071 employees in 2014, including 28,207 permanent employees and 9,864 nonpermanent employees. Most of the agency’s employees are located on the national forests, but a significant number of employees work on college campuses, at research laboratories, or in urban settings. The most common occupations in the Forest Service are forestry technician (about 7,000 employees) and forester (about 4,000). The agency also employs about 700 forest-related researchers and research technicians.

According to the U.S. Office of Personnel Management, the number of people working for the Forest Service has declined slightly over the past decade from a total of 39,948 employees in 2006 to 38,055 employees in

2015 (-1,893 employees, -4.7 percent) (fig. 50-2). The reductions in force affect more nonpermanent and seasonal positions (-1,306), which includes most firefighting and support positions, than permanent, nonseasonal, full-time positions (-587). Significant shifts within agency personnel positions include a 39 percent decline in nonfire personnel and a more than 100 percent increase in fire personnel from 1998 to 2015. Reductions in nonfire Forest Service personnel ultimately result in fewer people dedicated to forest management and restoration, recreation, outreach, research, and other areas in which the agency works to support local communities, economic activity, and, ultimately, forest sustainability.

State forestry agencies employed 25,830 persons in 2014, including 7,756 foresters (30 percent); 4,782 technical persons (19 percent), 2,368 other professionals (9 percent), 1,375 administrative and clerical staff (5 percent), and 9,549 seasonal employees. The largest share of seasonal State forestry employees—more than 7,000—work in fire control and fire prevention. State forestry agency employment levels have fluctuated in the past decade, but currently maintain about the same levels as in the mid-2000s.

The U.S. Cooperative Extension System also provides support for sustainable forest management to private forest landowners, State and local government forest landowners, and urban residents in every State except Nevada. This system is a nonformal educational and outreach program designed to help stakeholders understand and apply

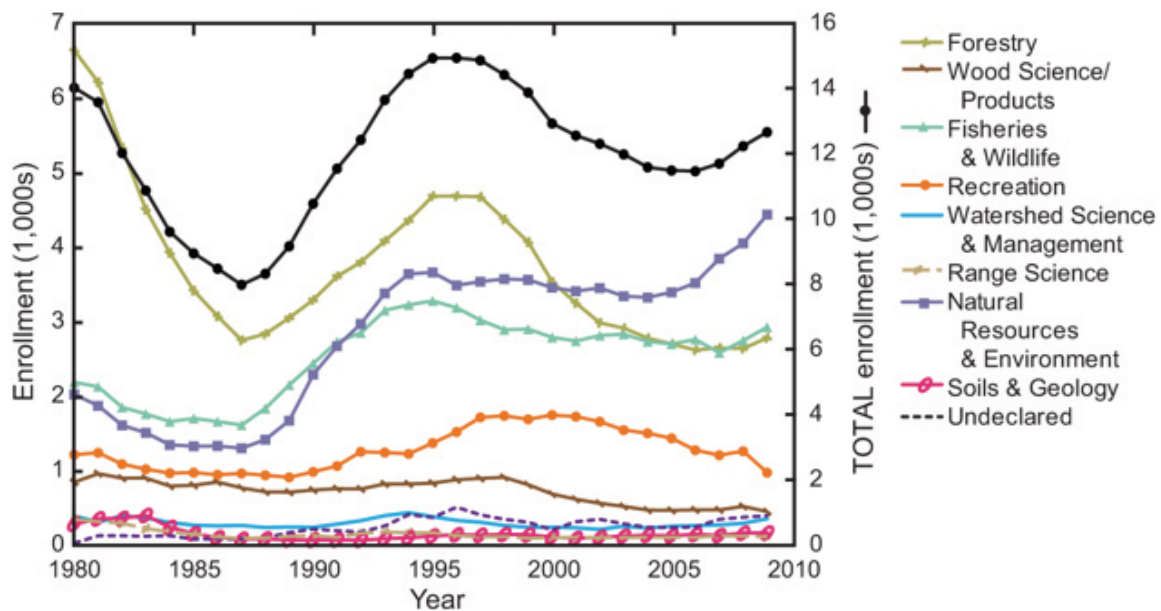


Figure 50-1—Undergraduate enrollment in natural resource programs by field of study at 31 National Association of University Forest Resources Programs institutions in the United States, 1980–2009. (Source: Sharik et al. 2015).

relevant research-based knowledge. A 2014 study found about 250 forest extensionists in the United States. The largest number of full-time equivalent (FTE) forest extension personnel worked in the South, followed by the North and West.

Membership in professional forestry organizations also gives some indication of the human capital available for forests and their management. The two most well-known and established professional forestry organizations in the United States are SAF and ACF. Both organizations enroll forestry and forest-related professionals as members, and students may join SAF. SAF and ACF have about 10,000 and 650 members, respectively. Experts estimate that SAF may have only about one-quarter of all U.S. foresters as members, which would suggest there may be up to 40,000 forest resource professionals in the country. In addition, many other professions and persons contribute to sustainable forest management, as indicated in the summary of persons employed by the Forest Service and State forestry agencies, which alone employ more than 50,000 persons. Since public lands account for about 40 percent of the total forest area, with private land managers, the number of forest resource professionals of some type in the United States could be more than 100,000.

Federal, State, and local governments also invest directly (e.g., through the construction of roads and dams) or indirectly (e.g., through cost-share projects with private enterprises) in infrastructure projects affecting forests and their management, often supporting private-sector production, local livelihoods, and social well-being. Private-sector investments in sustainable forest management have fluctuated over the past decade or so. For instance, according to the U.S. Census, total capital expenditures by the wood products manufacturing sector were \$3.056 billion in 2007; declining by almost 50 percent by 2009, following the recession; and recuperating to \$3.526 billion by 2015 (table 50-2). Government investments in public infrastructure such as roads, bridges, schools, parks, and other physical facilities provide an important complement to the capital investments made by private firms, particularly in forest-dependent communities. Additionally, some public financial resources available for supporting sustainable forest management, such as fiscal incentives and tax breaks, require the development or maintenance of adequate facilities and forest infrastructure, such as roads, firebreaks, fire-fighting gear, and harvesting equipment.

Federal, State, and local governments who own public lands, teach, or perform research and private sector firms and forest owners who manage forests or forest product

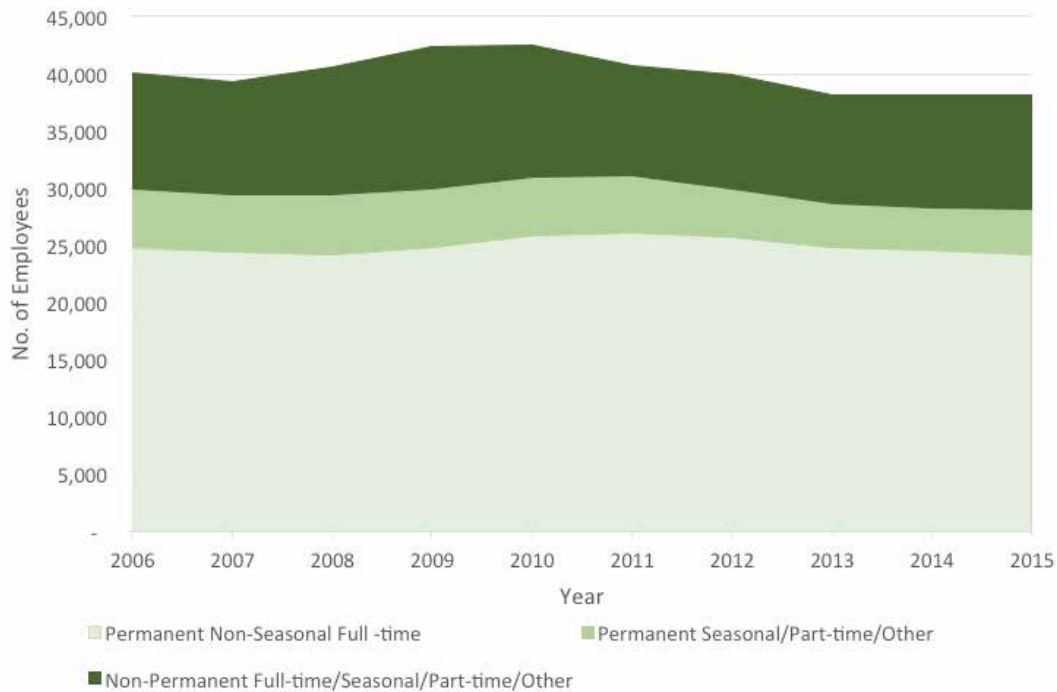


Figure 50-2—USDA Forest Service employment, 2006–2015 (Source: USDA Forest Service, information on file).

manufacturing facilities are also responsible for developing and maintaining adequate infrastructure to support the supply of forest goods and services. Overall, infrastructure investments in the United States, while significant, have declined some in the past decade or so. For example, more frequent, large forest fires in recent years, has resulted

in an increasing share of the budget for national forests being dedicated to firefighting, at the cost of infrastructure and other critical investments. Indeed, the Forest Service fire budget now exceeds the national forest management budget. States also have retrenched many of their forestry programs with increasing firefighting demands.

Table 50-1—Selected statistics on forestry employment and membership in professional organizations  
Sources: USDA Forest Service; National Association of State Foresters; Sagor et al. 2014; Society of American Foresters; Association of Consulting Foresters

Type/Region/ Organization	Forest Service	State Forestry Agencies	Cooperative Extension	Society of American Foresters	Association of Consulting Foresters
	no. employees in 2014	no. employees in 2014	no. FTEs in 2013	no. members in 2014	no. members in 2014
Status					
Permanent	28,207	16,281		---	---
Nonpermanent/ Seasonal	9,864	9,549		---	---
Total	38,071	25,830	248	10,099	651
Region					
North and DC	---	---	89	3,411	162
South	---	---	106	3,466	394
Mountain	---	---	15	1,166	23
Pacific Coast, Alaska, Hawaii	---	---	39	2,056	72

FTE = full-time equivalent

Table 50-2—Total capital expenditures by wood products manufacturing enterprises, 2007–2015  
(Source: U.S. Department of Commerce, U.S. Census Bureau).

Year	Total Capital Expenditures (\$1,000)	No. of establishments
2007	3,056,913	17,432
2008	2,517,930	17,115
2009	1,605,372	16,295
2010	1,685,956	15,435
2011	1,802,404	15,142
2012	no data	14,715
2013	3,137,354	14,430
2014	3,606,392	14,448
2015	3,526,872	14,484

# What has changed since 2010?

U.S. college and university forestry programs, while extensive, saw undergraduate enrollments generally decline slightly in the 2010s, as wildlife and natural resources enrollments increased. Trend data are lacking, but Federal, State, and private forestry employment is robust and has been fairly stable in the 2010s after cuts after the 2008 recession. Ongoing shifts in public agency activity, budget, and workforce from forest management to fire management in the last two decades mark an important change in public forest management. The broader field of natural resources and fisheries and wildlife management also contribute substantially to forest resource management capacity in professional management, research, and outreach activities. Infrastructure essential for sustaining forests may be in decline.

## References:

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