

U.S. Forest Service R&D Newsletter - July 2018

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U.S. Forest Service  
**Research  
and Development**

Monthly News and Highlights from  
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***News from the Washington Office and Research Stations***

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## FEATURED NEWS

### State of the Nation's Forests

The 17th annual [report](#) on forest health by the Forest Service Health Monitoring program indicates that U.S. forests face many challenges. For example, the report describes 62 mortality-causing insects and diseases detected on nearly 7.4 million acres across the lower 48 states and an analysis of tree mortality in the West based on [Forest Inventory Analysis](#) data showing that mortality exceeded growth in many places.



## HUMAN HEALTH

### Biodiversity May Help Protect Children from Developing Asthma

A USDA Forest Service [study](#) of nearly 50,000 children in New Zealand found that those who live in neighborhoods with diverse natural vegetation have a nearly 7 percent lower risk of developing asthma. However, children living in areas with the invasive plant gorse or exotic conifer species were at a 3 percent and 4 percent higher risk, respectively, of developing the chronic lung disease. The Forest Service collaborated with Massey University using a database that covers most of New Zealand's 4.6 million residents.



## AMPHIBIANS

### Rapid Response Plan to Counteract Amphibian Fungal Pathogen

Forest Service scientists worked with international collaborators to develop a [plan](#) to address the emerging threat of the fungal pathogen "Bsal," which causes the disease chytridiomycosis in amphibians. The pathogen is one of the greatest threats to amphibian biodiversity and may lead to worldwide extinctions.



## INVASIVE SPECIES

### Illegal Marijuana Sites on National Forests Can't Hide from Science

Forest Service scientists are helping to [counteract](#) illegal marijuana grows on National Forest lands, where growers use toxic rodenticides and pesticides that endanger wildlife and humans. The researchers have developed computer algorithms that detect sites using aerial and satellite imagery, mapping models that reveal factors affecting decisions by growers on where to locate grow sites, and scientific evidence that supports site reclamation and restoration.



## INVASIVE SPECIES

### The Secret to a Long Life: How Great Basin Bristlecone Survive Beetles

Forest Service [research](#) reveals that the Great Basin [bristlecone pine](#)--which can live for over 5,000 years--not only repels mountain pine beetles but also provides a hostile environment for the invaders' offspring. Nearly all other pine species within the beetle's native range in Western North America have proven to be susceptible hosts for the next generation of beetles.

The unique defenses of the Great Basin bristlecone pine might be used to develop strategies to protect other high-value trees from mountain pine attacks.



## CONSERVATION

### Ranking Locations for Lion Conservation in Southern Africa

An international team of researchers that includes the Forest Service developed a [strategy](#) for focusing lion conservation activities in areas where they will be most impactful. These include dispersal areas (regions where lions move between breeding sites), strategic corridors used by lions to move between dispersal areas, and locations at highest risk of human-lion conflict. The researchers identified these focus areas by analyzing GPS collar data that revealed lion movements.



## BIRD CONSERVATION

### A Warmer Midwest Could Make a Common Songbird Less Common

Forest Service scientists [predicted](#) Acadian flycatcher populations through the year 2100 across the 96-million-acre Central Hardwoods Region to understand how climate change might affect them over time. Under severe warming projections, changes in forest habitat and increases in nest predation by snakes could push the birds in the region close to extinction by the end of this century.



## AQUATIC SUSTAINABILITY

### Hope for Trout and Salmon as Western Waters Grow Warmer

Forest Service scientists [found](#) that average summer and early fall river temperatures in the northwestern United States rose about 1° Celsius from 1976 to 2015 and could rise another 1° Celsius by 2050. This warming trend is likely to affect economically important trout and salmon species

But trout and salmon are adapting by moving to cooler sites during heat waves and altering their migration timing. They also appear to be gradually shifting upstream to live long-term in cooler waters. The researchers point out several management options for managers to help offset warming and preserve cold-water river habitats, such as minimizing water withdrawals from rivers and increasing shade through riparian vegetation.



## AQUATIC SUSTAINABILITY

### Leveraging Leftovers: Using New eDNA Technique to Track Freshwater Species

Forest Service [researchers](#) and partners are pioneering a quick, cost-effective, noninvasive method for simultaneously testing small quantities of river water for the presence of multiple species in freshwater ecosystems. This method is based on sampling for environmental DNA (eDNA): DNA left behind from skin cells, feces or urine of animals that have been in the river.

View this [storymap](#) to learn how multispecies eDNA may support management of freshwater organisms, particularly threatened species.



## WATER SUPPLY

### The Future of Forested Watersheds

Forest Service scientists and partners developed a [model](#) to help define how fine-scale land use patterns impact watersheds. Resulting information will help water managers and city planners identify where future forest loss might produce the greatest impacts.



## FORESTRY

### Family Forests Impacted by Fragmentation

Forest Service [research](#) shows that family-owned forests are increasingly compromised by bordering lands. This research, which incorporates [Forest Inventory and Analysis](#) data, compares landscape patterns from 2001 to 2011 and finds a 1.5 percent increase in family forests bordered by developed or agricultural areas. This habitat fragmentation may damage an adjacent family forest's ability to sustain ecosystem services.



## FOREST RESTORATION

### Where to Source Seeds Used in Restoration?

Forest Service [research](#) identifies actions needed to improve decision-making about whether to use local or nonlocal native seeds in forest restoration projects. Traditionally, restoration practitioners have sourced local seed to maintain the evolutionary history of plant populations and limit risks. However, the impacts of habitat fragmentation and climate change on plant populations have led some to advocate for using non-local seed populations to prepare for future environmental conditions.



## SOCIAL JUSTICE

### Increasing African American Land Asset Value in the South

Forest Service researchers have partnered with other agencies to support community-based assistance programs in southern states through the [Sustainable Forestry and African American Land Retention Project](#). Research shows that African American landowners whose families migrated to industrializing northern cities in the early- to mid-1900s return to family land in the South after retirement or to care for aging parents.



## NONTIMBER FOREST PRODUCTS

### Why Harvest Nontimber Forest Products?

A [report](#) by Forest Service researchers synthesizes the best available science to help decision-makers, practitioners, and researchers promote the sustainable harvest of nontimber forest products. The harvest of products such as medicinal herbs, wild onions, and mushrooms contributes millions of dollars to the U.S. economy each year, but a lack of data has prevented a thorough analysis of their economic value. This report helps fill these gaps.



## BEE CONSERVATION

### Want to Help Bees? Take a Break from Lawn Mowing

Across the globe, native bee species are having trouble, with populations experiencing decline attributed to habitat loss. A Forest Service [study](#) found that cutting the grass every two weeks can significantly increase bee abundance in your own backyard. This allows for relatively short grass and plenty of lawn flowers that bees can access.



## HISTORY

### Out-of-control Flooding Motivated Early Forest Conservation Efforts

Deforestation in the eastern U.S. stripped away tree cover that prevented runoff, leading to torrential flooding in the late 19th and early 20th centuries. In 1907, [flooding](#) from the Monogahela River watershed in West Virginia caused \$100 million in damage en route to Pittsburgh (pictured), where it created another \$8 million in damage. This event and others culminated in the Weeks Act of 1911, which authorized the U.S. Secretary of Agriculture to purchase private lands to protect river and watershed headwaters and allowed for these lands to be preserved and maintained as national forest territory.



## DID YOU KNOW?

### What are the Oldest Trees in the World?

Standing high atop the White Mountains of the Inyo National Forest in California, the Great Basin bristlecone pines rank as the [oldest trees in the world](#). These trees live in the mountains of Eastern California, scattered throughout high mountains of Nevada and, to a lesser extent, Utah. There are many trees in the bristlecone pine forest of the White Mountains that exceed 4,000 years of age and are still growing. Recent research indicates there is a living tree older than 5,000 years.

## Recent Blogs



**Faces of the Forest Service: Meet Carlos Milan Torres**

Carlos is the information technology specialist for the Forest Products Laboratory.



**Faces of the Forest Service: Meet Brooke Penaluna**

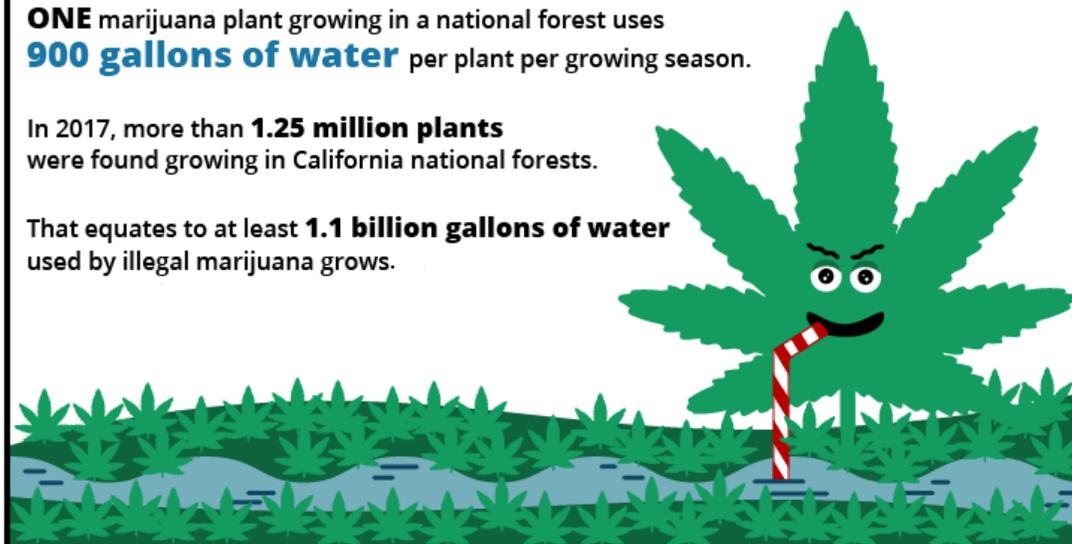
Brooke is a research fisheries biologist at the Pacific Northwest Research Station.

**MARIJUANA: A WATER GUZZLER**

**ONE** marijuana plant growing in a national forest uses **900 gallons of water** per plant per growing season.

In 2017, more than **1.25 million plants** were found growing in California national forests.

That equates to at least **1.1 billion gallons of water** used by illegal marijuana grows.



[Learn more about Illegal Marijuana Grows](#)

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