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# Can Sheep Help Stop Cheatgrass?

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*Fall grazing on cheatgrass in Deer Creek canyon. Hopping and Renee Kehler are off in the distance, watching the sheep.*

## Scientists and ranchers in Idaho are trying something new to stop cheatgrass—using sheep!

Cheatgrass is a fast-growing plant that was brought to the U.S. by accident. It spreads quickly, pushes out native plants, and dries out early in the year. That makes it very easy to catch fire. Places with a lot of cheatgrass burn more often than they used to.



*Cheatgrass becomes very flammable after it dries out, causing damage to the range.*

## So what makes cheatgrass such a problem?

Cheatgrass spreads easily because it grows early, steals water from other plants, and has seeds that move around easily. One way cheatgrass spreads is through grazing. When animals like cows or sheep walk through cheatgrass, its seeds stick to their fur or feet. Sometimes they eat the seeds and poop them out later in a new place.

Grazing also breaks up the soil and removes native plants, which gives cheatgrass more space to grow. If animals eat too much or stay in one place too long, it helps cheatgrass spread even more. But not all grazing is bad. Some scientists are testing careful grazing, where sheep eat cheatgrass early in the year before it goes to seed. This might help stop it from spreading and reduce fire risk.

**Kelly Hopping, a scientist from Boise State University, is leading a study to see if sheep can help. Sheep eat grasses and weeds, so scientists wanted to know if they would eat cheatgrass too.**

Sheep were brought to special study areas in the mountains. Scientists watched them in spring and fall. They found that sheep will eat cheatgrass—especially in the fall, when it's dry and there's less other food. In the spring, when there's lots of green plants, the sheep don't eat as much cheatgrass.

The sheep wore GPS collars so scientists could track where they went and how much time they spent in the test areas.



*Abigail Moody /Boise State Public Radio*

**Hopping hopes they can continue the project to get many more years of data with different weather, treatment and timing conditions to eventually build a guide for other rangeland managers interested in targeted sheep grazing.**

The scientists also studied the soil and other plants. They want to make sure that using sheep won't hurt the good plants or make cheatgrass grow more. They are also learning how cheatgrass affects fire and how much it spreads.

This research could help ranchers and land managers find better ways to stop cheatgrass and reduce wildfires.



*Boise State University Professor Kelly Hopping points toward a band of sheep grazing in a research plot nearby. (Photo by Steve Stuebner/LOTR)*

## Questions to discuss:

**How do we encourage ranchers do this? Why wouldn't ranchers do this?**

**This is one innovation to help stop the spread of cheatgrass. What else can your group think of to help protect the sagebrush steppe ecosystem?**



# Attacking Invasive Cheatgrass at Its Root

**Not much can stop cheatgrass from spreading. That's why scientists are turning to a solution in the soil, a microbe that inhibits the growth of cheatgrass roots, giving native plants a chance to return.**

Cheatgrass is a plant that doesn't belong in the western United States, but it's spreading quickly—so fast that it now covers over 50 million acres of land that used to be full of native sagebrush.

This is a big problem. Animals like sage grouse, mule deer, and pygmy rabbits depend on sagebrush to live. It's also bad for ranchers and people who live in fire-prone areas. Cheatgrass burns very easily, and it helps wildfires spread faster and more often.

Before cheatgrass, fires in sagebrush land happened maybe every 30 to 150 years. But once cheatgrass moves in, fires can happen every 3 to 5 years.



*In August and September 2007, a lightning strike sparked the 48,000-acre Castle Rock wildfire near Ketchum, Idaho. Cheatgrass helped fuel the fire. Photo © Kari Greer via U.S. Fish and Wildlife Service Headquarters on Flickr*



*Dixie Dringham holds up cheatgrass on the left and native grass on the right. Photo © Hannah Letinich*

## So what makes cheatgrass such a problem?

It grows earlier in the spring and later into the fall than most native plants. Its roots grow quickly and steal water and nutrients before other plants can get them. Then cheatgrass dries out by early summer—becoming perfect fuel for wildfire. When fire burns through, it kills native plants and makes more room for cheatgrass to grow. This keeps happening year after year, until cheatgrass takes over.

Big sagebrush, a native plant, is especially hurt by this. It gets killed by fire and takes around 10 years to grow back. If fires happen too often, there's no time for sagebrush to return.

For a long time, people tried to get rid of cheatgrass with herbicide (plant-killing chemicals). But herbicides mostly kill grown plants—not the seeds left in the soil. Those seeds grow back the next year, and people have to spray again and again.

**That's why a scientist named Ann Kennedy is working on a new idea: using bacteria (tiny living things in the soil) to stop cheatgrass from growing.**

These helpful microbes can block cheatgrass roots from growing too fast, giving native plants a better chance to survive and come back.

Ann has studied soil for over 30 years. One day she noticed a wheat plant that wasn't growing well, and she wondered if something in the soil was causing it. She and her team collected over 25,000 tiny organisms from Washington soil and tested them. One of them—called D7—looks very good at stopping cheatgrass and might be safe for other plants and animals.

This tiny bacteria might be a big part of the solution to our cheatgrass problem. The helpful bacteria called D7 doesn't just stop cheatgrass—it also works on another harmful plant called medusahead. Even better, it doesn't hurt native plants, crops, or animals.



*Cheatgrass on the land of Dixie Dringham. She volunteered for D7 (the biocontrol) testing on some plots of her land. Photo © Hannah Letinich*

**Some people were worried that animals might get sick if they ate the bacteria.**

But scientists tested it and found that it disappears from the surface of the ground or plants after just 48 hours. The only part that stays behind goes into the soil, where it keeps working. That makes it safe for wildlife. This is good news for animals like the pygmy rabbit, which live in sagebrush areas. These tiny rabbits eat mostly sagebrush, so they need that habitat to stay healthy and safe.

Another great thing about D7? It saves money. Spraying the bacteria costs about \$8–10 per acre, and once it's in the soil, it can keep working for years. That means you don't have to spray it again every year. Compare that to herbicides, which cost about \$15 per acre—and you have to spray them every single year. By the third year of testing, scientists saw about 50% less cheatgrass in almost every place where the bacteria was used. That means fewer weeds, fewer fires, and more room for native plants to grow back.



*A patch of land on Dixie Dringham's property where the D7 biocontrol has taken effect, allowing native grasses to grow back. Prior to treatment this was all cheatgrass. Photo © Hannah Letinich*

**Questions to discuss:**

**What would you tell land managers and leaders to do next with this bacteria?**

**This is one innovation to help stop the spread of cheatgrass. What else can your group think of to help protect the sagebrush steppe ecosystem?**



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# Why were so many trees cut down in Ponderosa State Park?

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**If you visited Ponderosa State Park near McCall this summer, you might have noticed big changes to some of the forested areas off the park's main road.**

Large slash piles sit along the road and elsewhere in the park, and the forested area has been noticeably thinned using selective logging. Selective logging is when only certain trees are cut down instead of clearing the whole forest. This helps forests stay healthy by reducing fire risk, making space for younger trees to grow, and protecting wildlife habitat. Smaller trees that cannot be turned into lumber are piled up and burned.

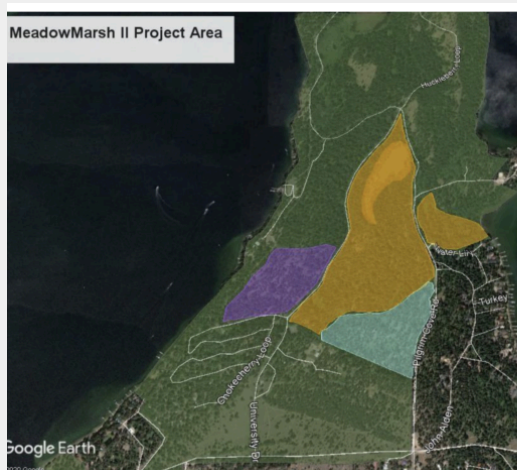
It's part of a large project by Idaho State Parks & Recreation aimed at restoration of the forest, to restore a balance of the park's namesake ponderosa trees that officials say has changed with fire suppression techniques over the years.



*A slash pile left after forest thinning work in Ponderosa State Park. Photo: Don Day/BoiseDev*

**The state says the project will remove mostly grand fir trees, which make up about 56% of the trees in the 90-acre Meadow Marsh II forest area.**

Forest managers say ponderosa pines are naturally resistant to "periodic, low-intensity fires," due to thick bark and high branches. But they say prior fire suppression techniques allowed "great numbers" of Grand fir trees to grow which could lead to a more catastrophic fire that could be "unnaturally severe."



*Map of project area in Ponderosa State Park*



Meadow Marsh I project area  
before 1996 restoration.

The past project opened the  
area up, reducing wildfire fuel  
and encouraging plant growth.

A similar project in the 1990s of another forest area in the park opened up the forest floor with less overgrowth and more prominent ponderosa trees according to park managers.

The state says it hopes to get back about \$88,000 through the sale of some of the timber removed from the park.

### Questions to discuss:

**What are the negatives to selective logging?**

**What are the positives?**

**This is one innovation to help stop big fires in Ponderosa forests. What else can your group think of to help protect this ecosystem?**



# How Fire Can Help Forests

**California has had some of the biggest and most dangerous wildfires in history.**

These fires are made worse by hot, dry weather caused by climate change. But another big reason for these huge fires is that there hasn't been enough fire in the past 100 years.

A long time ago, forests in places like Yosemite looked very different. There were more open meadows, fewer trees, and lots of healthy plants. Native American tribes helped keep the land healthy by using small, careful fires. This kind of fire is called a cultural burn.



*On-site at a cultural burn led by Ron Goode on the Jack Kirk estate in Mariposa, California. Credit: Sinead Santich*

## Cultural burns help the land by:

- Clearing out dry plants that could catch fire easily
- Making space for helpful plants like oaks and berries to grow
- Bringing water back to the land
- Helping animals and people who rely on these plants

When European settlers came, they didn't understand this practice. They stopped Native people from using fire, and forests became too full of trees and brush. These thick forests now burn hotter and faster, making wildfires worse.



*A side-by-side comparison of Yosemite in 1872 versus 2020. Tree cover in the area has greatly expanded. Credit: University of California*

## Today, some scientists and land managers are learning from tribes like the North Fork Mono, Yurok, and Karuk.

They are starting to allow cultural burning again to help forests become healthy and safe.

Cultural burns are done with care and passed down from older to younger generations. The goal isn't just to stop big fires—it's to take care of the land for the future.

Some places, like Yosemite, are starting to bring back cultural burning with the help of Native leaders. New laws in California are also making it easier for tribes to do this important work.



Sisters Lillian Rentz and Janet Morehead of the Karuk Tribe examine California hazel stems recently harvested from a controlled burn area. Credit: Frank K. Lake/U.S. Forest Service

By using traditional knowledge and working together, we can help forests grow strong again—and protect people, animals, and plants for many years to come.



Ashes are raked into the soil to encourage plant regrowth after a cultural burn. These restorative steps are an integral part of the cultural burn process. Credit: Sinead Santich

## Questions to discuss:

**Why is it important to listen to people who have lived on the land for a long time?**

**What would you say to a neighbor who is worried about using fire to take care of land?**

**This is one innovation to help stop big fires in Ponderosa forests. What else can your group think of to help protect this ecosystem?**



# Fires, Forests, and Safer Neighborhoods

## How We Can Live Safely in Lodgepole Pine Forests

As our world gets warmer and drier, wildfires are becoming more common—especially in the forests of the western United States. Scientists wanted to know: how can we make neighborhoods safer from fire, especially in forests filled with lodgepole pine trees?

They used computer models to study what might happen in the future, and they learned some important lessons.



*A neighborhood trims for fuel, The Nature Conservancy*

## More Fires Are Coming

No matter what kind of weather happens, more land is likely to burn. By the year 2050, big fires could happen more often, especially during hot and dry years.

But something surprising also happened: the most dangerous fires (called high-intensity fires) didn't keep getting worse forever. After a while, fires burned up a lot of the fuel (like dead trees and plants), so there was less left to burn.

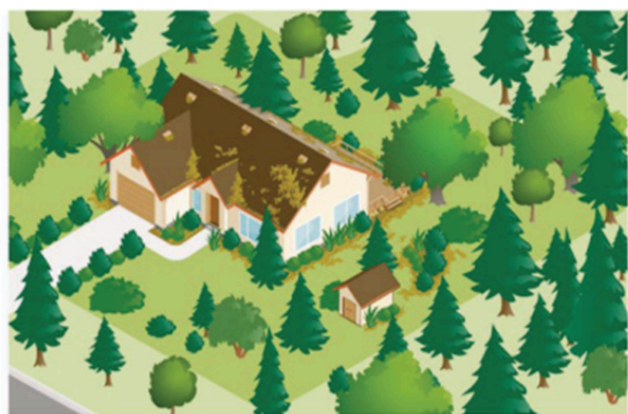
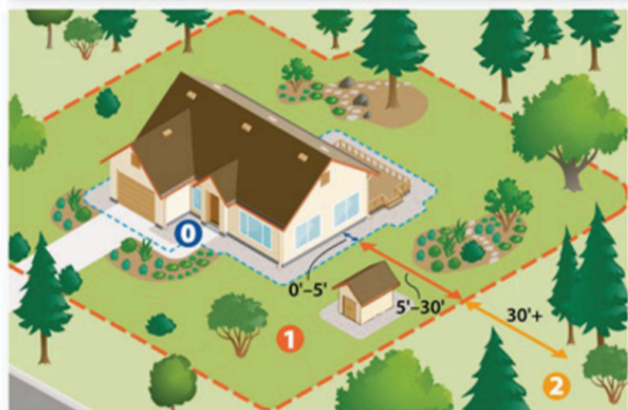


*Figure 4. Before (upper) and after (lower) implementation of the three-zone defensible space strategy. While this figure shows a forested setting, the same concepts apply to other vegetation types (e.g., grass- and shrub-lands) and residential settings (Valachovic, et al. 2021).*

## Cleaning Up Around Homes Helps

The study looked at how defensible space—cleaning up trees and dry plants around homes—affected fire danger. These cleanups helped lower flame sizes near houses, especially when done every 10 years. But if homes were spread out, fire could still move from house to house.

The best results happened when homes were:

- Grouped closely together
- Surrounded by treated land

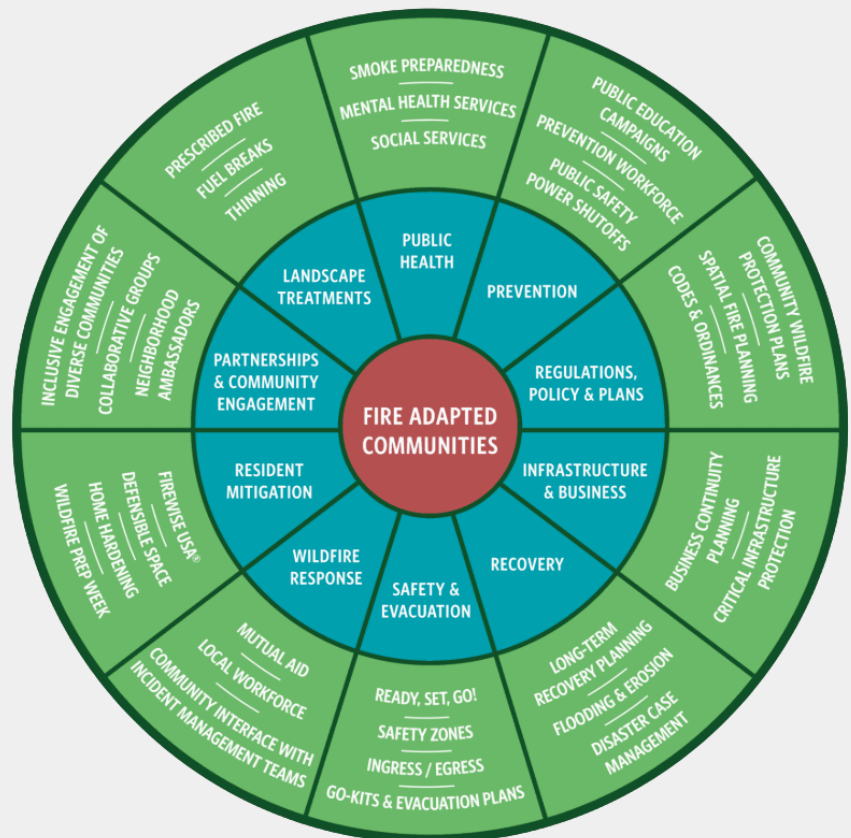
This made fires less likely to reach homes.

## Neighborhood Design Makes a Big Difference

Houses that are clustered—close together like a little village—are much safer from fire than houses that are spread out. It's easier for firefighters to protect them, and fewer houses are at risk.

So, if people want to live in forest areas, the safest plan is:

- Build homes close together
- Treat the land around them often
- Work together with neighbors



## What Is a Firewise Community?

A Firewise community is a neighborhood where people work together to make their homes and land safer from wildfire. They follow smart practices like:

- Cleaning up dry plants
- Using fire-resistant building materials
- Making emergency plans
- Helping neighbors prepare

Being Firewise means thinking ahead—and working as a team—to protect your home, your forest, and your community.

### Questions to discuss:

**What don't more neighborhoods use Firewise landscaping?**

**This is one innovation to help stop big fires in Lodge Pole Pine ecosystems. What else can your group think of to help protect this ecosystem?**



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# Project Pinecone: Restoring Idaho's Forests

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## The forests near Stanley, Idaho, are very special.

They grow many kinds of pine trees, and seeds from these trees have been used to replant burned forests all over the Northwest. But after recent wildfires, there aren't enough seedlings left to replant the local forest—only enough for about 50 acres.



*Pinecones are collected by professional tree climbers who use harnesses and spurred boots to climb trees between 75 and 120 feet tall. The pinecones are then transferred to Lucky Peak Nursery for seed processing. (Photo by Bill Josey)*



*A team with the Sawtooth National Forest collected 75 bushels of pinecones in August and September to restore its seed bank at Lucky Peak Nursery. (Photo by: Elexis Bernstein, USFS)*

## That's why a group started Project Pinecone.

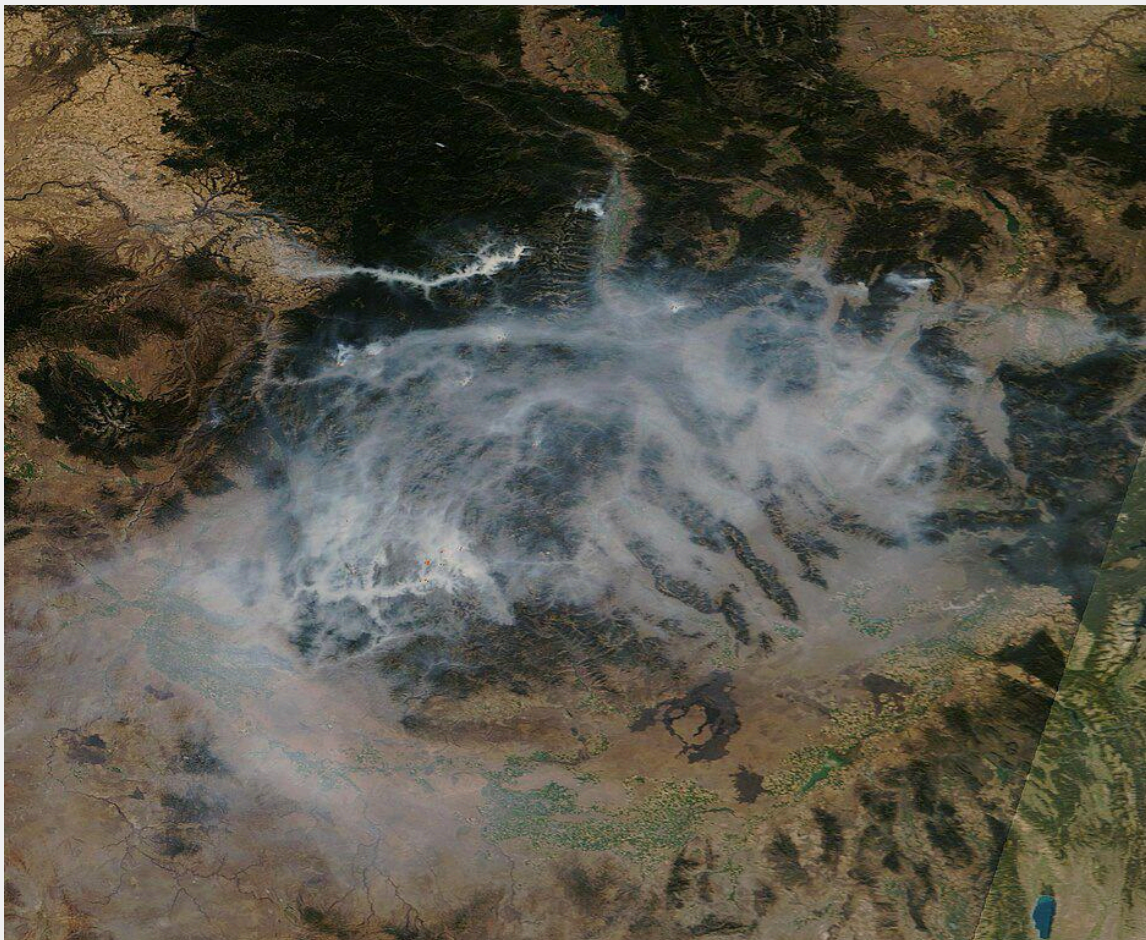
Their idea was simple: raise money to pay for "pinecone pickers." These workers climb tall trees to collect pinecones. Each cone has about 25 seeds inside, and some of those seeds will grow into new trees. With enough cones, thousands of young trees can be planted in burned areas.



## **Regrowing after severe fires**

A recent survey showed that about 480 acres of forest outside Stanley had burned so badly that nature alone couldn't bring the trees back. Project Pinecone's goal was to raise \$15,000 to pay for pinecone pickers to collect enough seeds for about 140,000 new trees—enough to replant the most damaged area.

Thanks to donations from people and local companies, Project Pinecone raised even more than expected—\$25,000! That means even more trees will be planted to help the Sawtooth National Forest recover.



*Wildfire smoke hovers in the Sawtooth Mountains*

### **Questions to discuss:**

**Why do people need to help replant the forest instead of just letting nature do it on its own?**

**This is one innovation to help recover from big fires in Lodge Pole Pine ecosystems. What else can your group think of to help protect this ecosystem?**