

In 1995 a microscopic fungus called *Phytophthora ramorum*, or *P. ramorum*, was first detected in the forests of the western United States. *P. ramorum* infects trees and causes particularly serious damage in oak trees: in many infected oaks, leaves wither rapidly, large cracks appear in the bark, and the trees die. A spread of *P. ramorum* represents a serious threat to the forests in the western states. Several methods of protecting the forests have been proposed. First, stopping *P. ramorum* spores from spreading would surely be an effective method. Spores are small particles through which all fungi, including *P. ramorum*, reproduce. Researchers have discovered that many *P. ramorum* spores can be found along hiking or biking trails, suggesting human-assisted spread by way of shoes and bicycle tires. A few measures to prevent such human-assisted spread—like encouraging hikers to wash their shoes and installing new bike scrubbers on bicycle trails—would be an effective and low-cost way to stop the spread of *P. ramorum*. Second, there are a few fungicidal (fungus-fighting) chemicals that can be used to protect the oak trees. Some of these chemicals stimulate the oak trees' natural defenses against the *P. ramorum* fungus and have been found in small-scale tryouts to significantly reduce the likelihood that the oaks will be infected. A third way to fight *P. ramorum* is a practice called clear-cutting. This approach starts with cutting and burning the diseased oaks, but it also involves cutting and burning the seemingly healthy vegetation (bushes and other kinds of trees) surrounding the oaks. This is done because some of the surrounding plants and trees may be infected even though they do not show any symptoms of the disease. Clearing large areas of vegetation in places where diseased trees are found is often an efficient measure to stop the spread of infections.

Now listen to part of a lecture on the topic you just read about. Unfortunately, the methods described in the passage have serious limitations that make them ineffective or impractical in many situations. Precautions like cleaning shoes and using bike scrubbers might help a little but they will not make a huge impact. The problem is that *P. ramorum* spores do not spread just through human assistance. Studies have detected the spores in water streams following rainfall. It appears that the spores are frequently picked up by rainwater and washed into water streams, which then carry them long distances. This type of water-assisted spread is much harder to control. Second, the fungicides referred to in the reading provide effective protection against *P. ramorum* only when they're injected directly into the tree trunks. But their effect lasts only for a few months, so the injections have to be repeated. Now, this type of treatment might work if you want to protect a few oak trees in a city park, but it's just not very practical in protecting whole forests that contain thousands and thousands of oak trees. Can you imagine forest managers having to inject every single oak in a large forest with a dose of fungicide every few months? That sounds impractical and also too expensive. Third, as the reading explains, clear-cutting destroys the vegetation around the sick oak trees, because some of that vegetation may be infected. But keep in mind that some of that surrounding vegetation is in fact healthy, and it gets destroyed in the process anyway. Now, in some forests it makes sense to sacrifice some healthy vegetation in order to stop the spread of a dangerous disease. However, the vegetation in many forests of the western United States includes tree species that are very rare and cannot grow back easily. So, clear-cutting in these forests would mean destroying many healthy rare trees. This would represent a greater ecological damage than the *P. ramorum* damage

we' re trying to prevent.

Summarize the points made in the lecture, being sure to explain how they cast doubt on the specific methods proposed in the reading passage.

Do you agree or disagree with the following statement? Leadership comes naturally: one cannot learn to be a leader. Use specific reasons and examples to support your answer.