

Invasive Species and California's Natural History

What is an invasive species?

Invasive species can be defined in a few different ways, but for the purposes of this lesson, we will use three distinguishing factors.

Invasive species:

- Are not native
- Compete with and displace native plants
- Can cause ecological and economic harm

So, what do these factors mean? A native species is a plant or animal that is indigenous to an area. These plants are naturally occurring and have usually been in their habitat for an extended period of time. By contrast, invasive species are not native to an area, but have been introduced. This could have been done purposefully, or by accident. Not all introduced plants, however, are destined to become invasive species. Invasive species compete with native plants for natural resources (such as sunlight, water, nutrients, and space). Over time, these invasive species can displace and outcompete native species, leading to a decline or even complete extinction of native species. (See table for common invasive and native species)

Invasive species not only impact single species, but can ultimately affect entire ecosystems. These changes can put stress on an ecosystem in a multitude of ways including: native animals who no longer have adequate sources of food or shelter, soil parameters such as pH and available nutrients, and an increase in the frequency of wildfires. It can also have substantial economic consequences. Bark beetles killing native pine trees and eucalyptus trees falling over during high winds and rain are just a few examples of how invasive species can cause financial impact to homeowners and governments. One ecological and economic stress that we will focus on in this lesson is how invasives change wildfire ecology.

How do invasive species impact California's Fire Ecology?

If you've lived in California for any number of years, you have probably been witness to, or know someone who has been affected by the destruction of wildfires. In California, it seems that in late summer and early fall, we have come to expect at least a few wildfires to spread across our state. Wildfires are a natural and regularly occurring phenomenon that many of Southern California's native plant species are adapted to survive. Many of these native plants in ecosystems such as Chaparral and Coastal Sage Scrub can tolerate low intensity fires and will, over time, return to the state the ecosystem was in before the fire. Fires remove debris and burn underbrush opening up the forest floor to sunlight and nutrients that were not previously available. Some native species even depend on these low intensity fires in order to spread their seeds and reproduce, such as pine cones which need fire to open and spread their seeds.

In California, as invasive species continue to spread, they begin to influence the ecology of wildfires. Most of these plants have a short life - growing, taking up resources, seeding, and then quickly dying. These now dead, dry, invasive species can increase the frequency of fire by providing a more continuous source of fuel that is much easier to ignite than native plants. By adding more fuel, fires not only burn more often, but burn a wider area at a higher intensity. These high intensity fires can spread to other ecosystems, like the riparian (river), where plants are less adapted to fire. Native species, such as oak trees, become permanently damaged by these intense fires happening more frequently

After these fires sweep through an area, invasive species are usually the first to re-grow. Invasives often have a rapid re-establishing period, allowing them to quickly seed and cover a majority of the land around them. This prevents native plants from growing and recovering in this newly altered land.