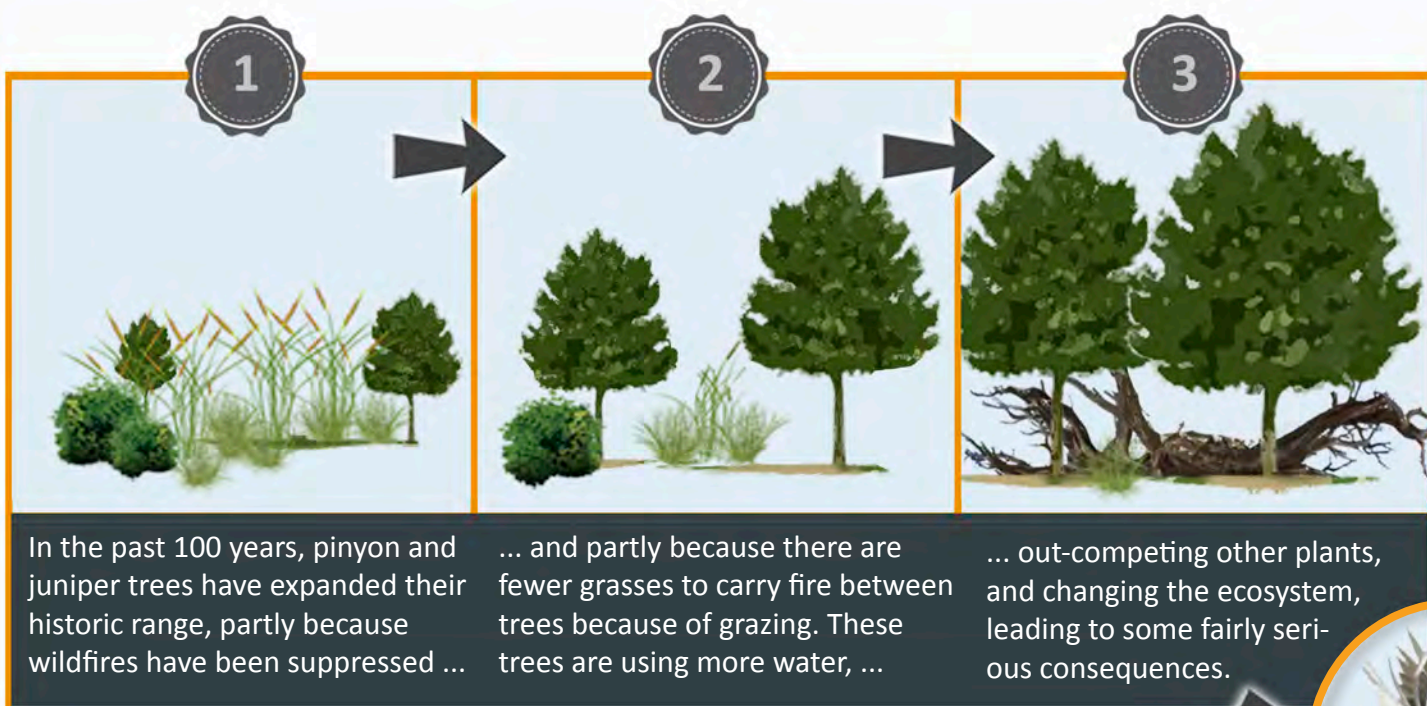


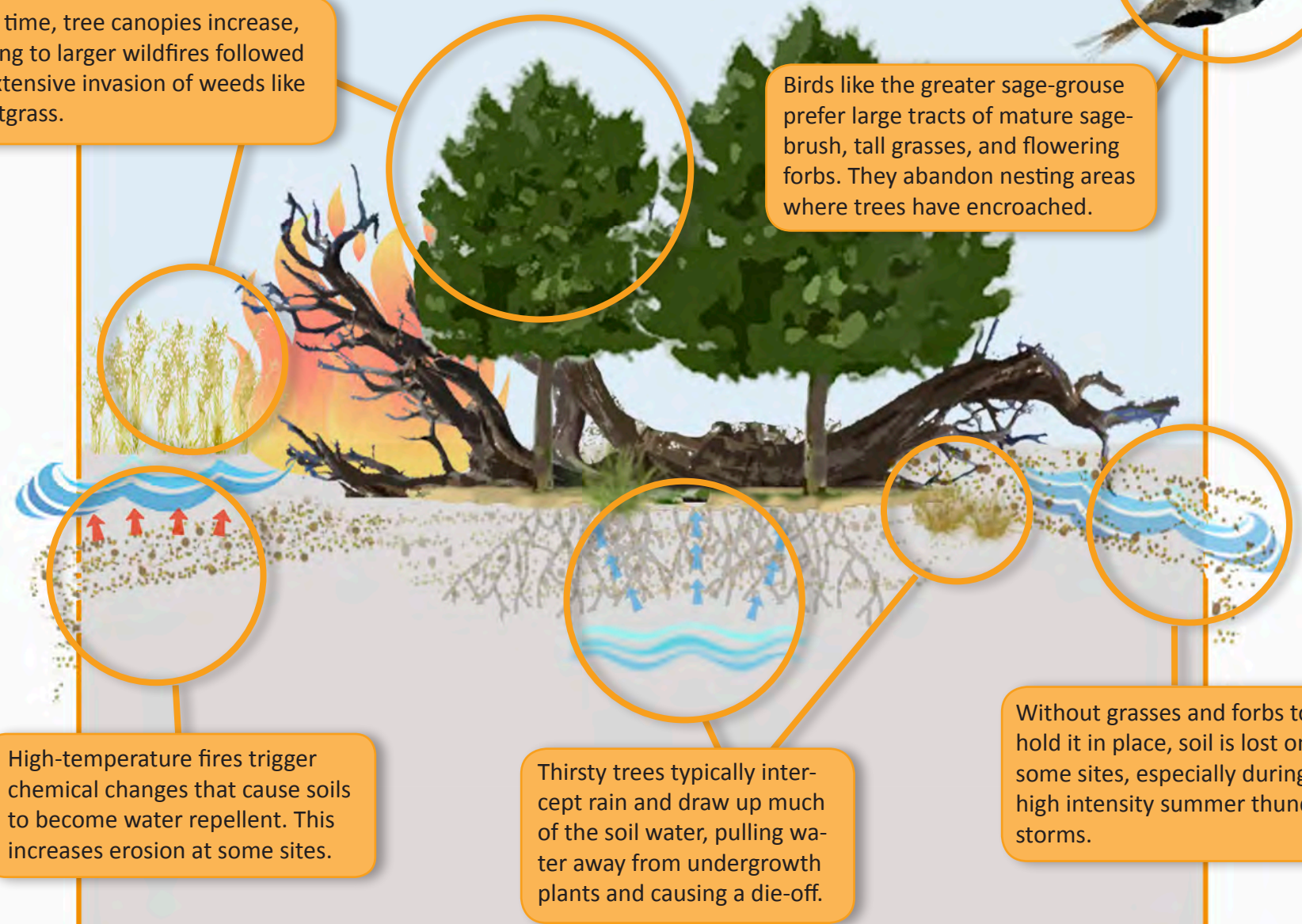
# EXPANSION

## of Pinyon and Juniper Trees in the Great Basin



Over time, tree canopies increase, leading to larger wildfires followed by extensive invasion of weeds like cheatgrass.

Birds like the greater sage-grouse prefer large tracts of mature sagebrush, tall grasses, and flowering forbs. They abandon nesting areas where trees have encroached.



High-temperature fires trigger chemical changes that cause soils to become water repellent. This increases erosion at some sites.

Thirsty trees typically intercept rain and draw up much of the soil water, pulling water away from undergrowth plants and causing a die-off.

Without grasses and forbs to hold it in place, soil is lost on some sites, especially during high intensity summer thunderstorms.

## REMEDIES

### Prescribed Fire



Prescribed fire reduces both trees and shrubs. Areas treated with prescribed fire have lower shrub cover than those treated with cutting or shredding even six years after treatment.

### Cutting



Clearcutting uses chainsaws to cut trees taller than half meter, and leave them where they fall. It can reduce tree cover to less than one percent of what it was before treatment.

### Shredding



During mastication, live trees are shredded with a spiked, rotating drum attached to a tractor. It can be done any time the soil is dry enough to avoid excessive compaction.

Prescribed fire, and mechanical treatments like cutting and shredding, reduce the number of encroached trees. This increases the time that soil water is available to other plants in the spring, which increases grass and shrub growth and cover. Water and available nutrients become available to both desirable native grasses and unwanted weeds like cheatgrass.

Prescribed fire removes live trees and consumes much of the wood on the ground, allowing later wildfires to be less intense and less severe.

Cutting and shredding are more flexible, more controlled, and less risky than prescribed fire. They reduce canopy fuels and allow easier wildfire suppression, and can be done any time of year, as long as the ground is not too wet.

Prescribed fire causes short-term increases in runoff and soil erosion. But this should be evaluated in the context of the big picture – avoiding more serious consequences of encroachment and wildfire.

Mechanical treatments like cutting typically double or triple the amount of small down wood that could burn during a wildfire, particularly in older woodland stands.

Shredding produces mulch that can increase water infiltration rates and reduce erosion.

Shredding aids in wildfire suppression by bringing the fire from tree tops to the ground.

Warm and dry sites are not well-suited to prescribed fire, especially if native grasses are missing from the understory.

The burnable mulch left after shredding and the downed wood from cutting can increase the risk of high-temperature ground fires, which may damage desirable plants and seeds by causing the fire on the ground to burn hotter and longer.

Treatment of any kind increases burnable grass fuels, especially in older stands, probably because the removal of woody vegetation results in an increase in soil water during the growing season, which can be captured by grasses and flowering plants like forbs as they grow to re-claim the site.

To best maintain and increase cover, sites should be treated before the encroaching tree cover approaches 20% (to maintain shrubs) or 45% (to maintain grasses and forbs). These sites will have more surviving native plants at the onset, which will help prevent a cheatgrass invasion later.

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