

## Reforestation Your Forestland after a Wildfire

 [articles.extension.org/pages/73378/reforesting-your-forestland-after-a-wildfire](https://articles.extension.org/pages/73378/reforesting-your-forestland-after-a-wildfire)

### Article Written by:

Yvonne Barkley, University of Idaho Extension, Moscow, ID

One of the first activities most people plan after a burn is reforesting their forestland after a wildfire. **Reforestation** is the process of establishing a new stand of trees on a previously forested site following a disturbance such as fire. There are two ways to re-establish a stand of trees. **Natural regeneration** is when you let nature handle the job of revegetating a site with trees, whereas **artificial regeneration** is when you bypass nature and seed or plant the site yourself. The success of any natural regeneration after a burn will depend on the abundance of seed available, both in surviving species and in soil seedbanks, that remains after a burn. And though the most cost-effective means of reforesting your property, natural regeneration does not allow for species selection, stocking levels, and spacing.



The standard choice for artificial regeneration is to plant seedlings. Direct seeding is not recommended. Seed eaten by rodents, birds, and insects can drastically affect success and incur additional follow up costs for fill-in planting, brush control, and thinning. By planting seedlings you can select favored species and get a one to five year head start on other plants that will sprout from local seed.

### Planning Your Reforestation Project

A successful reforestation project will require a considerable amount of planning and preparation. There are many things to accomplish before planting day.

#### Species Selection

Select the species you want to plant.

- Match the species to the site. Consider soil type, amount of precipitation, slope aspects, and frost pockets. Look at past management records to see what species did well and what did not. Consider a mix of conifers and some shrubs, forbs, and grasses for the understory.
- Look at your management objectives. Do you have multiple goals? Perhaps some areas will be primarily for timber production, others are riparian areas, and yet others designated as wildlife habitat areas. Do not forget to take into consideration other, more non-tangible needs such as recreation, aesthetics, and view sheds.
- Trees that are grown from seed gather at sites with similar conditions to yours will do better. The most commonly used criteria for matching seed zones in the Inland Northwest is elevation, and reputable nurseries should be able to tell you at what elevation their seed was collected for each species.

#### Stock Selection

Select the type of stock you want to use.

The most important characteristic of your planting stock will be the caliper (diameter) of the stem. The larger the caliper, the stronger and more resilient the seedling. Attention should also be paid to the shoot to root ratio. You need a sufficient amount of top to support the root system with 'food' from photosynthesis and a sufficient amount of root system to support the top with moisture and nutrients.

Planting stock comes in two basic forms:

- **Bareroot stock** is grown in nursery seedbeds, lifted, and transplanted to field sites. As the name implies, this type of stock has no rootball of soil around the roots. Bareroot stock is the most commonly found reforestation stock and is usually available in larger sizes at a lower cost. Some species of trees, such as hemlock, do not grow well as bareroot stock and will not be readily available. Bareroot stock is also more susceptible to stresses such as heating and drying during storage and shipping. Good shoot to root ratios for bareroot stock are 2½ - 3 (shoot) to 1 (root).
- **Plug, or container grown**, stock is grown in containers and removed from the container before planting. This type of seedling retains the plug of soil it is grown in and usually experiences less transplant shock, though they usually cost more than bareroot stock. This type of stock is becoming more readily available and some nurseries offer a variety of sizes. Frost heaving is more of a problem with containerized stock than bareroot trees. Good shoot to root ratios for containerized stock are 1-1½ (shoot) to 1 (root).

## Quantity

How many trees will I need?

The answer to this question, as so many others when addressing natural resource management issues, is "it depends". It depends on the burn severity, number of trees and species present before the burn, management objectives, site characteristics, and the carrying capacity of the site. Tree planting recommendations are usually offered as number of trees per acre or as a specified spacing. But these recommendations are not very useful to landowner who is faced with planting areas that have experienced a mosaic of burn severities. Restocking your land to mimic pre-burn densities is not a good guideline either. Chances are good to excellent that you had too many trees per acre before the burn – most people do.

Reforestation companies commonly plant 435 trees per acre at 10' x 10' spacing on clearcut sites that will experience high mortality from harsh conditions such as droughty conditions, sites with south- or west-facing aspects, or high animal depredation. Numbers decrease with better conditions and will decrease again when you have residual trees. A distance of 16 feet between trees will give you approximately 170 seedlings per acre; 20 foot spacing will result in 110 seedlings per acre.

**The best I can offer is this.** Using your management objectives, the characteristics of each area you want to plant, and your state's reforestation requirements, determine the number of trees you want to have per acre when they reach maturity, subtract the number of surviving trees per acre and add 10 % to compensate for mortality. If your site is particularly harsh or you expect a lot of animal depredation, add 25% for mortality.

## Project Considerations and Steps

Most states have Forest Practices Acts (FPA), which are laws set to guide landowners on basic forest practices and outline minimum management requirements. These Acts usually include reforestation standards. It is important to be familiar with your state's FPA laws. They are sometimes vague and misinterpretation is not an excuse for noncompliance. To be sure, contact your local state land's office for a copy of your state's rule and for any clarification you may need on particular laws.

## Order Your Trees

Finding and selecting a nursery is the same process as finding and selecting a contractor. Locate several nurseries and visit them, if possible, to see the quality of their stock. Compare availability of species and types of stock and compare costs. When ordering reforestation stock it is best to order early to get the number and species of trees you want.

## Site Preparation

Site preparation is done to ready the soil to receive seed or seedlings, reduce fire hazard, and/or control pest and diseases. Fortunately, even low intensity burns will leave you with partially prepared seedbeds by decreasing or

removing duff layers and competing vegetation and exposing mineral soil. Treat weeds and any remaining undesirable vegetation the fall before planting. This gives you time to see if your preparation was effective and to do any follow up treatments as needed.

## Planting

Spring planting conditions are optimal when soil temperatures are 40oF at a depth of four to six inches. But many reforestation projects are started as soon as the snow is off the ground and the site is accessible in order to take advantage of spring moisture.

- When your order arrives from the nursery, handle the boxes gently to prevent damaging seedlings. If you cannot plant immediately, ensure seedlings are stored properly. Keep seedlings as cool as possible in the packaging material they arrive in, even if it is only for a day or two. Open the boxes and make sure the roots are moist. If not, add some water, rewrap, and close the box. If you need to store your seedlings for a week or more, put them in refrigerated storage at temperatures as close to 35oF as possible.
- Only take as many boxes out to the site as you can plant in one day. If your storage area is close to your planting site, remove boxes in batches throughout the day. Keep boxes and bundles of seedlings out of direct sunlight and be careful how you shade them. Seedlings in a tarp-covered box will be hotter than if placed directly in the sun. The best place for your seedlings at the planting site is in heavy shade under existing trees. If you have no shade at the site, you can create some by suspending a tarp at least three feet above boxes, which will allow air to circulate freely between tarp and boxes.
- While planting, move seedlings around the site in a planting bag or five-gallon bucket. This not only gives you an easy way to transport them, but also protects them from wind, sun, and heat. When possible, plant seedlings on the north- or east-sides of stumps and logs, which will provide some protection from direct sun.
- Dig a good hole. Planting holes should be twice as wide and as deep as the root system or plug. Spades, shovels, and hoedads are the tree planters' tools of choice – dibbles are not recommended as they do not create a large enough hole and often contribute to soil compaction.
- Place the seedling in the hole, making sure you spread the roots out if you are using bareroot stock. Backfill, keeping sticks and rocks out of the hole, and firm the soil around the seedling with your hand. DO NOT firm the soil around your seedlings by stepping around them – this compacts the soil and is commonly referred to as “the death stomp”.

## Maintenance

- Expect weeds. They will be most abundant in areas that were severely burned, adjacent to established weed populations, and/or in poor condition before the burn. Pay special attention to riparian areas, as they typically have richer and moister soils and are able to support a greater diversity of plant species.
- Weed control methods include hand treatments, herbicide applications, biological controls, and changes in grazing prescriptions, with the most commonly used being chemical control. You can call your local Extension office or agricultural and forestry chemical supply company for information and recommendations.

As a rule, the more severe the burn, the more likely the need for reforestation. One thing you can count on – empty space will quickly be occupied by vegetation. Your goal is to ensure that the vegetation that occupies the space is the vegetation you want and planned for.