



Guidelines For Rehabilitating Landscapes After Fires

There is a wide range of scientific opinion over how to rehabilitate forest and range lands after intense wildfires. ODFW is aware that some range conservationists are promoting the exclusive use of native seed sources for rehabilitation efforts. Some are recommending only the use of seeds that originate from genetically local sources of native species. However, in recent years, the size and severity of wildfires in Oregon have created a demand for native seed sources to rehabilitate burned landscapes that exceed supply. In the absence of native seed sources, some are recommending that no seeding occur regardless of the fire impacts to the landscape.

Wildfires cause short-term loss of wildlife habitat. Wildfires can cause soil erosion, which can negatively impact aquatic habitat and water quality. In some cases wildfires can generate enough heat to change soil surface characteristics and thereby inhibit water infiltration, plant establishment and hinder response of native perennial plant species. These areas can be particularly susceptible to invasion by noxious weeds leaving the landscape more vulnerable to long-term reduction in productivity and stability. ODFW objectives for rehabilitating landscapes after wildfires are to:

- 1) stabilize soils to minimize impacts to water quality and aquatic habitats;
- 2) minimize competition for native vegetation recolonization;
- 3) prevent the invasion of noxious weeds and other undesirable species; and
- 4) provide cover and forage for wildlife.

ODFW encourages prescribed treatments that are based on site-specific conditions. In areas where fire impacts are light, ODFW's goal is natural recovery by native species. In areas where fire impacts warrant rehabilitation (i.e., to stabilize erosion prone soils, or prevent noxious weed invasion), ODFW believes native seed sources should be used. Seed developed from local genetic material is preferred. However, in the absence of native sources, the use of non-native seed sources is appropriate in certain situations to accomplish the objectives listed above. ODFW believes that discrete use of non-natives can benefit the ecosystem by minimizing short-term resource impacts, and increasing the likelihood of long-term natural site restoration. All landscape rehabilitation projects should be monitored over time to determine whether or not treatment objectives were met, and to make adjustments if necessary.

Certified weed free non-native seed is often available that meets treatment objectives. There are species available that do not persist over time, will not cross pollinate with local plants, and will not likely spread beyond the treatment area. Prescriptions that include these species provide land managers with the flexibility to address short-term resource risks, then re-seed with native seed when available, or allow native species to recolonize on their own. Specific seed mix recommendations will vary depending on ecoregion, topography, soil types, moisture regimes, and other site-specific factors.

Resource objectives may be different depending on land ownership and management goals. When it is deemed appropriate to rehabilitate after a fire and the supply of native seed sources is limited, ODFW recommends using a seeding guidance manual (i.e., *Oregon and Washington Guide for Conservation Seedings and Plantings* – NRCS, 2000) to determine an appropriate seed mix for a specific application.

In addition, ODFW offers the following general seed mixes for the various ecoregions in Oregon. These seed mixes can be tailored to meet specific land management objectives, or to address site-specific needs. In general, on highly erodible sites where native vegetation is the recolonization goal, increase the percentage of annuals in the seed mix and increase the application rate (pounds of seed mix per acre). On non-erodible sites where the recolonization by native vegetation is a priority, increase the percentage of annuals in the seed mix, but decrease the application rate. On highly erodible sites where native recolonization is not a concern, increase the application rate. On non-erodible sites where native recolonization is not a concern, use the prescribed seed mix. Finally, ODFW recommends that land managers consult with their local District Wildlife or Habitat Biologists or resource managers on site-specific changes to these mixes. A list of ODFW Regional Offices is included at the end of the Seeding Mixtures. The Regional Office staff will be able to direct you to the appropriate ODFW Biologist in your area. Seeding information is also available at local NRCS and Soil and Water Conservation District Offices.

Listing of Seeding Mixtures

Introduced = (I), Native = (N)

Erosion Control = (EC), Forage = (F)

*These species provide good erosion control and/or forage for wildlife, but may be controversial due to the length of time they persist on the landscape (3 to 7 years or more). Many are shade intolerant and will disappear as the native vegetation recolonizes. Their use should be carefully considered by land managers, and only used to meet specific management objectives.

Northwest Oregon

Pasture Mix – Used for seeding pasture lands, roadsides, and forest areas. This mix was developed to reduce sod formation, provide high quality forage for deer and elk, and readily establish in most areas of western Oregon. Application rate is 12-14 pounds per acre.

26% Annual ryegrass (tetraploid) (I) (EC)

25% *Potomac orchardgrass (I) (EC) (F)

20% *New Zealand white clover (I) (EC) (F)

15% *Perennial ryegrass (I) (EC) (F)

14% Annual crimson clover (I) (EC) (F)

Southwest Oregon

Umpqua Watershed

Elk Mix – This is recommended where fall and spring forage are limiting factors. It is appropriate for soils and rainfall in the westside Klamath Basin ecoregion. It provides vertical and horizontal plant diversity and good soil stabilization as well as very palatable forage for deer, elk and game birds while maintaining a high nutritional value. Application rate is 40 pounds per acre if applied to bare ground, or 20-30 pounds per acre if over seeding.

- 35% *Subclover (I) (EC) (F)
- 10% Meadow brome (N) (EC) (F)
- 15% Annual ryegrass (I) (EC)
- 25% *Berber or Palestine orchardgrass (I) (EC) (F)
- 8% *New Zealand white clover (I) (EC) (F)
- 7% Alfalfa (I) (F)

Low Invasive Mix – This mix provides fair nutrition for a short time (2-3 years) before dying out and has the advantage of stabilizing soils while providing a moderately palatable mix of diverse plants for deer, elk and other herbivores. It provides very non-competitive forage when compared with other non-native mixes. Application rate is 40 pounds per acre.

- 28% *Common vetch (I) (EC)
- 16% *Perennial ryegrass (I) (EC) (F)
- 20% Annual ryegrass (I) (EC)
- 14% *New Zealand white clover (I) (EC) (F)
- 7% Meadow brome (N) (EC) (F)
- 15% Big bluegrass (N) (F)

Rogue Watershed

Forage Mix – This seed mix provides erosion control and good wildlife forage on low to mid-elevation sites in the Rogue Watershed. Annual rye grass is fast growing for soil stabilization, and is not persistent. Subclover is very nutritious for deer and elk, and has been shown to suppress the noxious weed yellow starthistle. Other types were chosen for their high forage value. Application rate is 25 pounds per acre.

- 30% *Subclover blend (I) (EC) (F)
- 25% Annual ryegrass (I) (EC)
- 10% *Paiute orchardgrass (I) (EC) (F)
- 10% Rose clover (I) (F)
- 10% Winfred brassica (I) (F)
- 5% *Timothy (I) (F)
- 5% Tonic plantain (I) (F)
- 5% Persian clover (I) (F)

North Central Oregon

Low Precipitation 12-20 inches - Application rate is in pounds per acre.

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| Sherman big bluegrass (N) (F) | 2 lbs. |
| *Covar sheep fescue (I) (EC) (F) | 2 lbs. |
| Secar bluebunch wheatgrass (N) (EC) (F) | 2 lbs. |
| Delar small burnet (I) (F) | 2 lbs. |

Sanfoin (I) (F)	2 lbs.
Ranger and Ladak alfalfa (I) (F)	1 lb. each
Beardless wheat (I) (EC) (F)	10-20 lbs.

Precipitation Zone 18-30 inches - Application rate is in pounds per acre.

*Paiute orchardgrass (I) (EC) (F)	3 lbs.
Mountain brome (N) (EC)	3 lbs.
*White clover (I) (EC) (F)	2 lbs.
Delar small burnet (I) (F)	2 lbs.
Ranger and Ladak alfalfa (I) (F)	1 lb. each
Beardless wheat (I) (EC) (F)	20-30 lbs.

Grass Alternate: Oahe intermediate wheatgrass (F), Bannock thickspice wheatgrass (N) (EC) (F)

The wheat sprouts early and will provide good early soil stabilization and green feed. The seed will provide feed for birds and big game. The wheat will not persist and the other grasses and legumes will take over.

Central Oregon

Use on denuded sites, where the objective is to provide big game forage and other wildlife forage and cover. Application rate is in pounds per acre.

12"> Precipitation (up to 15 lbs./acre total of the following seed mix including a cover crop)

Sandberg's bluegrass (N) (F) or sherman big bluegrass (N) (F)	½ -1 lb.
Bluebunch wheatgrass (N) (EC) (south and west aspect)	2 lbs.
Idaho fescue (N) (EC) (F) or *sheep fescue (I) (EC) (F)	1 lb.
Bottlebrush squirreltail (N) (EC) (F)	½ -1 lb.
Prairie June grass (N) (EC) (F)	½ lb.
Needle Grass (N) (EC) (F) (Needle and Thread, Thurber's, or Western depending on site)	½-1 lb.
Great Basin wildrye (N) (EC)	½ lb.
*Paiute orchardgrass (I) (EC) (F) (if appropriate)	1 lb.
Arrowleaf balsamroot (N) (F)	0.2 lb.
Spurred lupine (N) (F)	0.2 lb.
Western yarrow (N) (EC)	0.2 lb.
Ranger or Ladak alfalfa (I) (F) (if appropriate)	2 lbs.
Small burnet (I) (F) (if appropriate)	½ lb.
Bitterbrush (N) (site appropriate)	1 lb.
Sagebrush (N) (site appropriate)	¼ lb.

12"< Precipitation (up to 10 lbs./acre total of the following seed mix including a cover crop)

Sandberg's bluegrass (N) (F) or sherman big bluegrass (N) (F)	½ -1 lb.
Bluebunch wheatgrass (N) (EC)	2 lbs.
Idaho fescue (N) (EC) (F) or *sheep fescue (I) (EC) (F)	1 lb.
Bottlebrush squirreltail (N) (EC) (F)	½ -1 lb.
Needle grass (N) (EC) (F) (Needle and Thread, Thurber's, or Western depending on site)	½-1 lb.
Indian ricegrass (N) (EC) (good for sandy soils)	½ -1 lb.

Great Basin wildrye (N) (EC)	½ lb.
Western wheatgrass (N) (EC) or *Paiute orchardgrass (I) (EC) (F) (if appropriate)	½ -1 lb.
Arrowleaf balsamroot (N) (F)	0.2 lb.
Spurred lupine (N) (F)	0.2 lb.
Western yarrow (N) (EC)	0.2 lb.
Lewis blue flax (N) (EC) (F) (if appropriate)	½ -1 lb.
Ranger or Ladak alfalfa (I) (F) (if appropriate)	1-2 lbs.
Bitterbrush (N) (site appropriate)	1 lb.
Sagebrush (N) (site appropriate)	¼ lb.

If appropriate, use one of the following as a cover crop:

Pioneer Triticale (I) (EC) (F)	10 lbs.
Regreen (sterile wheat) (I) (EC) (F)	10 lbs.
Beardless wheat (I) (EC) (F)	10 lbs.
Beardless barley (I) (EC) (F)	10 lbs.

Northeast Oregon

Umatilla County – Application rate is in pounds per acre.

Dry South Facing Slopes with Little Soil:

Secar bluebunch wheatgrass (N) (EC) (F)	6 lbs.
*Covar sheep fescue (I) (EC) (F)	2 lbs.
Idaho fescue (only if above 2,000 ft. elevation) (N) (EC) (F)	2 lbs.
Sherman big bluegrass (N) (F)	1.5 lbs.

On dry south slopes with more soil, add:

Ladak alfalfa (I) (F)	1 lb.
Small burnet (I) (F)	2 lbs.

North slopes or flat areas with soil and some broken shade quality (charred sticks count):

*Paiute orchard grass (I) (EC) (F)	2 lbs.
*Timothy (I) (F)	½ lb.
*Meadow foxtail (I) (EC) (F)	2 lbs.
Sherman big bluegrass (N) (F)	1 lb.
Idaho fescue (N) (EC) (F) or *Covar sheep fescue (I) (EC) (F)	1.5 lbs.
*Dutch white clover (I) (EC) (F)	2 lbs.
Ladak alfalfa (I) (F)	2 lbs.

Same as above only with rocks or little soil:

Sherman big bluegrass (N) (F)	2 lbs.
Idaho fescue (N) (EC) (F)	3 lbs.
*Paiute orchardgrass (I) (EC) (F)	3 lbs.
Small burnet (I) (F)	2 lbs.
Ladak alfalfa (I) (F)	1 lb.

Wallowa County – Application rate is in pounds per acre.

*Potomac orchardgrass (I) (EC) (F)	2 lbs.
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*Timothy (I) (F)	½ lb.
Alfalfa (I) (F) – If grazed, Rhizoma or Spreader	2 lbs.
– If not grazed, Ladak	2 lbs.
*Dutch white clover (I) (EC) (F)	1 lb.
Small burnet (I) (F)	½ lb.
Cereal wheat (beardless) (I) (EC) (F)	5 lbs.

Baker County – Seed mix will depend on the particular site potential (i.e. available moisture, shade, and habitat type).

Range Mix: Application rate 5-7 lb./acre

Nomad Alfalfa (I) (F)	1-2 lbs.
Sagebrush (N) (same variety as before burn)	¼ lb.
Lewis blue flax (N) (EC) (F)	½ lb.
*Fourwing salt brush (I) (EC)	1-2 lbs.
Bitterbrush (N) (on dry sites if it was present before the burn)	½ lb.
*Paiute orchardgrass (I) (EC) (F) (more moist site)	2 lb.
or Bluebunch wheatgrass (N) (EC) (intermediate site)	1 lb.
or *Crested wheatgrass (I) (EC) (F) (dry site)	1 lb.

Forest Site Mix: Application rate up to 10 lb./ac

*Paiute orchardgrass (I) (EC) (F)	3-4 lb.
*White clover (I) (EC) (F)	1 lb.
Bitterbrush (N) (on dry sites if it was present before the burn)	½ lb.
Lewis blue flax (N) (EC) (F)	½ lb.
Small burnet (I) (F)	½ lb.

Grant County – Application rate is in pounds per acre.

*Intermediate wheatgrass (I) (EC)	2 lbs.
Idaho fescue (N) (EC) (F)	2 lbs.
Sherman big bluegrass (N) (F)	2 lbs.
Bluebunch wheatgrass (N) (EC)	1 lb.
Great Basin wildrye (N) (EC)	1 lb.
Small burnet (I) (F)	1 lb.
Winterfat (N) (F)	1 lb.
Mountain mahogany (N) (F)	1 lb.

South Central & Southeast Oregon – Application rate is in pounds per acre.

Seed mixes for grazable forest environments 15 -18” Precipitation (Common Mix)

*Intermediate wheatgrass (I) (EC)	4 lbs.
Mountain brome (N) (EC)	2 lbs.
Sherman big bluegrass (N) (F)	1 lb.
Idaho fescue (N) (EC) (F)	1 lb.
Slender wheatgrass (N) (EC)	1 lb.
*Paiute orchardgrass (I) (EC) (F)	1 lb.
Bitterbrush (N) (at forest edges)	1.5 lbs.
Sagebrush sp. (seed types of sp. present prior to fire) (N)	¼ lb. of PURE LIVE SEED

Seed mixes for sagebrush steppe and upland environments 9-12 " Precipitation (Common Mix)

Beardless wheatgrass (N) (EC) (F)	1 lb.
*Crested wheatgrass (I) (EC) (F)	1 lb.
Sherman big bluegrass (N) (F) or *Covar sheep fescue (I) (EC) (F)	1 lb.
Indian ricegrass (N) (EC)	1 lb.
Bottlebrush squirreltail (N) (EC) (F)	½ lb.
Blue flax (N) (EC) (F)	¼ lb.
Alfalfa (I) (F)	¼ lb.
Other native forbs common to site (F)	¼ lb.
*Fourwing saltbush (I) (EC)	2 lbs.
Bitterbrush (N)	1.5 lbs.
Sagebrush sp. (seed types of sp. present prior to fire) (N)	¼ lb. of PURE LIVE SEED

Seed mixes for saline or alkali soils and areas of poor drainage

Great Basin wildrye (N) (EC)	2 lbs.
*Crested wheatgrass (I) (EC) (F)	2 lbs.
Western wheatgrass (I) (EC)	2 lbs.
Thickspike wheatgrass (N) (EC)	2 lbs.
Indian ricegrass (N) (EC)	1 lb.
Bottlebrush squirreltail (N) (EC) (F)	½ lb.
Alfalfa (I) (F)	½ lb.
Other native forbs common to site (F)	up to 1 lb.
Sagebrush sp. (seed types of sp. present prior to fire) (N)	¼ lb. of PURE LIVE SEED

Single Species Applications (OR/WA Guide – NRCS 2000)

Beardless wildrye (N) (EC)	10 lbs.
Cereal barley (I) (EC) (F)	20 lbs.
Slender wheatgrass (N) (EC) (F)	7 lbs.
*Strawberry clover (I) (EC)	1-3 lbs.

Seed mixes for rangelands – 9 – 12" precipitation (Common Mix)

Bluebunch wheatgrass (N) (EC)	3 lbs.
Thickspike wheatgrass (N) (EC)	2 lbs.
Sherman big bluegrass or Sandbergs bluegrass (N) (F)	1 lb.
*Crested or siberian wheatgrass (I) (EC) (F)	1 lb.
*Paiute orchardgrass (I) (EC) (F)	1 lb.
*Yellow sweetclover (I) (F), or Native lupine (N) (F), or Vetch (I) (EC) if available	1 lb. (or ¼ lb. each)
Alfalfa (I) (F)	½ lb.
Bitterbrush (N)	1.5 lbs.
Sagebrush sp. (seed types of sp. present prior to fire) (N)	¼ lb. of PURE LIVE SEED
*Fourwing saltbush (I) (EC)	2 lbs.

Seed mixes for rangelands – less than 9" precipitation.

*Crested wheatgrass (I) (EC) (F)	2 lbs.
Bluebunch wheatgrass (N) (EC)	1 lb.

Sherman big bluegrass or Sandbergs bluegrass (N) (F)	1 lb.
Idaho fescue (N) (EC) (F)	1 lb.
Bottlebrush squirreltail (N) (EC) (F)	¼ lb.
Sagebrush sp. (seed types of sp. present prior to fire) (N)	¼ lb. of PURE LIVE SEED
*Fourwing saltbrush (I) (EC)	¼ lb.
Winterfat (N) (F)	¼ lb.
*Yellow sweetclover (I) (F)	¼ lb.
Native lupine (N) (F)	¼ lb.
Vetch (I) (EC)	¼ lb.
Alfalfa (I) (F)	¼ lb.

Sandy or Loam Soils

Thickspike wheatgrass (N) (EC)	2 lbs.
Indian ricegrass (N) (EC)	2 lbs.
*Crested or siberian wheatgrass (I) (EC) (F)	2 lbs.
Sherman big bluegrass or Sandbergs bluegrass (N) (F)	1 lb.
Basin wildrye (N) (EC)	1 lb.
Alfalfa (I) (F)	2 lbs.
Sagebrush sp. (seed types of sp. present prior to fire) (N)	¼ lb. of PURE LIVE SEED

ODFW Regional Offices

West Region (Clackamas) 971-673-6000
East Region (La Grande) 541-963-2138

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