

Restoring Native Grass Communities on the Oak Ridge Reservation

Before human disturbance and the widespread introduction of nonnative species, native grasses commonly grew on the Department of Energy's (DOE's) Oak Ridge Reservation (ORR). Unfortunately, nonnative grasses now dominate parts of the ORR, including areas that have been seeded with tall fescue or invaded by Japanese grass.

To bring back the natural biodiversity of native grassland communities, an initiative is ongoing to restore native grasses and wildflowers on the ORR. Planning for the restoration began in spring 2001, and planting began in summer 2002. Partners in the program along with Oak Ridge National Laboratory (ORNL) include the Tennessee Wildlife Resources Agency, Tennessee Valley Authority, DOE, Native Gardens Nursery, Tennessee Department of Environment and Conservation, and Southern Appalachian Man and the Biosphere.



Native grass and wildflower restoration has been successful near the east guard portal on Bethel Valley Road. (Photo by Pat Parr)

Restoration Species

The project to restore ORR native grass ecosystems focuses on a community approach using native grasses and wildflowers. The primary grasses being used in the ORR restoration are big bluestem, little bluestem, Indian grass, and switchgrass. These plants are prairie grasses, known as native “warm-season” or “bunch” grasses. Other grasses being planted include eastern gama, side-oats grama, river oats, bushy bluestem, and a variety of native rye grasses.

Native wildflowers are also included in the ORR restoration to add natural habitat features, food for wildlife, and aesthetic qualities. Among the wildflower species being planted are purple and gray-headed coneflowers; lanceleaf tickseed; black-eyed Susan; common and butterfly milkweeds; silky smooth, aromatic, smoky, and New England asters; marsh blazing star; showy goldenrod; golden ragwort; rattlesnake-master; Maximilian sunflower; cardinal flower; and ironweed.



Switchgrass (*Panicum virgatum*) grows up to seven feet tall in big leafy clumps. The pyramid-shaped flower clusters, borne singly on the end of branches, persist throughout the winter, providing shelter for animals when it snows. With an exceptionally deep root system, *Indian grass* (*Sorghastrum nutans*) is used for erosion control, conservation buffers, and wildlife cover. The most abundant native grass in the United States, *little bluestem* (*Schizachyrium scoparium*) appears in 90 percent of the states. It attracts birds and butterflies and is used for wildlife cover and erosion control. The decorative *river oats* (*Chasmanthium latifolium*) is found on river sandbars and provides food and wildlife cover. A highly ornamental bunch grass, *side-oats grama* (*Bouteloua curtipendula*) has its flower clusters mainly on one side of the stem. (ORNL photos of switchgrass by Mike Ryon and Indian grass and river oats by Pat Parr, little bluestem photo © J. S. Peterson @ USDA-NRCS PLANTS Database, and side-oats grama photo © Robert Soreng @ USDA-NRCS PLANTS Database)



A controlled burn was conducted in this field at Freels Bend: (from left to right) during the burn, immediately after the burn, during seeding, and two months after the burn. (Photos © R. K. McConathy)

Benefits of Native Grass Communities

Native bunch grasses grow upright with spaces between each bunch. This growth form makes them ideal wildlife habitat—providing protective cover, quality nesting areas, and open travel lanes. In addition, once established, these grasses are more nutritious for wildlife than nonnative grasses such as fescue. Animals commonly found in such communities include quail, deer, rabbit, turkey, migratory songbirds, and small mammals such as voles and mice. The rabbits and small mammals in turn attract larger predators such as fox, coyote, and raptors.

Native grass communities provide other environmental benefits, including filtering sediments and chemicals from runoff, dispersing water flow, and reducing erosion. Most native grass species develop a strong root system that contributes to an increase in soil fertility, recycling nutrients while alive and returning vital nutrients to the soil as the roots decompose. Because many native grasses are adapted to survive in almost any soil conditions, they require no fertilizer or irrigation after planting. Thus, over the long term, planting native grasses and wildflowers can reduce maintenance costs. Restored areas on the ORR have included powerline rights-of-way, roadsides, riparian buffer zones, flood plains, and fallow pastures.

Management

The economic and environmental benefits of natural plant communities on the ORR have been a key factor in this restoration initiative. Native grass communities can be maintained with prescribed burning, annual mowing, or some use of herbicides. Periodic controlled burning of native warm-season grasses maintains their vigor, encourages intense seed set, reduces invasions of woody plants and exotic grasses, recycles nutrients tied up in dead vegetation, stimulates insect life, and opens up the ground between grass clumps. Prescribed burns also reduce the chances of wildfire by removing fuel loads under controlled conditions.

For more detailed information on native grass restoration and management on the ORR, contact Pat Parr, the ORNL Natural Resources Manager, at 865-576-8123, or parrpd@ornl.gov; or check the Research Park Web site at www.esd.ornl.gov/facilities/nerp.



These bushy bluestem grass plugs were grown by Native Gardens Nursery from seed collected in East Tennessee. They were planted by scientists from the ORNL Environmental Sciences Division as part of the First Creek restoration effort. (Photo by Pat Parr)