

Invasive Plants

on the Oak Ridge Reservation

Not all green is good. Almost 170 species of nonnative plants grow on the Department of Energy's (DOE's) Oak Ridge Reservation (ORR). Many of these unwelcome plants have no natural controls in this area and compete with native vegetation. They are, thus, invasive and harmful to native biodiversity. President Bill Clinton signed Executive Order (EO) 13112 in 1999 to address the problem of invasive species in the United States. That EO requires federal agencies such as DOE to help prevent the introduction of invasive species and to control them.



Japanese grass is the most problematic invasive plant for the Oak Ridge Reservation. It forms dense patches and displaces native vegetation as it spreads. Its control involves labor-intensive hand pulling or multiple applications of herbicide.

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Harmful and unwanted effects caused by infestations of invasive plants include ecological, economic, and human health impacts such as

- displacing native flora;
- disrupting natural biological community processes by upsetting associations between native plants and animals;
- increasing maintenance costs for ORR infrastructure, grounds, and waste areas;
- altering the visual landscape;
- influencing compliance monitoring, research sites, and budgets;
- affecting security and safety;
- spreading to lands neighboring the ORR;
- transporting contaminants; and
- heightening wildfire hazards.

Where Problem Plants Grow

Often introduced as ornamental plants in gardens or planted for erosion control, invasive plants have escaped into the wild and flourish there. Invasive plants tend to be most problematic in disturbed areas such as clearings and openings along roads, under transmission lines, beside waterfronts, and in areas with dead pines. Some can,



Japanese honeysuckle occurs in early to mid-successional habitats. It kills young trees by twisting tightly around the trunks, cutting off the flow of water through the plant. Photos © R. K. McConathy.

however, grow on more natural sites. Kudzu (*Pueraria montana*) invades areas of the ORR along roads and transmission lines, but it is seldom found in adjacent, more natural habitats. In contrast, Japanese grass (*Microstegium vimineum*) grows not only in disturbed areas, but also spreads rapidly in forests unchanged for decades.

Some invasive plants are restricted to specific habitats. Spearmint (*Mentha spicata*), for example, is restricted on the ORR to the open wetland habitat in the Hembree Marsh Natural Area. Sun-loving invasive plants grow best in open, disturbed areas. Such species found on the ORR include sericea or Chinese lespedeza (*Lespedeza cuneata*), field garlic (*Allium vineale*), Johnson grass (*Sorghum halepense*), autumn olive (*Elaeagnus umbellata*), crown vetch (*Coronilla varia*), and fescue (*Festuca* species).

Other invasive plants can grow in a broad range of environments and are major management concerns across the entire ORR. Tree-of-heaven (*Ailanthus altissima*) and empress tree (*Paulownia tomentosa*) are both woodland edge and interior forest species. Japanese grass is found in habitats ranging from shallow flowing water to margins of gravel roads along dry ridge tops and in shaded forests. Chinese privet (*Ligustrum sinense*), although most abundant along road margins, is also common adjacent to streams and is occasionally present on drier, upland sites. Multiflora rose (*Rosa multiflora*) grows in a broad range of soils and environments from dry ridges to wet floodplains. Japanese honeysuckle (*Lonicera japonica*) also grows in a wide range of habitat, although it is less of a problem in woodlands than in open areas.



Chinese privet is most abundant on the Oak Ridge Reservation in disturbed areas. It produces copious quantities of fruits and seeds, enabling it to spread quickly. Photos © R. K. McConathy.

Some invasive plants grow in dense patches that smother and exclude native plants. Such patches on the ORR consist of Japanese honeysuckle, Chinese privet, multiflora rose, sericea lespedeza, periwinkle (*Vinca minor*), autumn olive, or bull thistle (*Cirsium vulgare*).

Management Plan

To protect the natural resources of the ORR, an invasive plants management plan is being implemented. It prioritizes eradication and restoration activities with the goal of returning the reservation to a more natural condition. A main focus is on minimizing the opportunity for invasive plant species to become established by using native species in landscaping and quickly revegetating disturbed areas with desirable species. Control will focus on those species that pose the greatest threats to native species or mission operations, emphasizing those that are most feasible to contain or eliminate.

For more detailed information on nonnative, invasive plants and their management on the ORR, contact Pat Parr, the ORNL Area Manager, at 865-576-8123; parrpd@ornl.gov.



Kudzu, nicknamed “the vine that ate the South,” is a prime example of an invasive species. It grows rapidly (up to a foot per day) and outcompetes native plants for resources by depriving them of sunlight for photosynthesis. Photo © R. K. McConathy (inset © David J. Moorhead, The University of Georgia, www.invasive.org).



Multiflora rose is present on the ORR along fence rows and in early to mid-successional habitats. It spreads rapidly and can form impenetrable thickets that exclude native plant species. Photo © R. K. McConathy (inset © James H. Miller, USDA Forest Service, www.invasive.org).