

THE TENNESSEE VALLEY AUTHORITY



Clinch River Barge/Traffic Area

Terrestrial Plant Communities and Botanical Resources Survey Report

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Affected Environment

Terrestrial Ecology (Plants)

The Barge/Traffic Area is located in the Southern Dissected Ridges and Knobs and Southern Limestone/Dolomite Valleys and Rolling Hills ecoregions, which are subdivisions of the Ridge and Valley. The Ridge and Valley, which occurs between the Blue Ridge Mountains on the east and the Cumberland Plateau on the west, is a relatively low-lying region made up of roughly parallel ridges and valleys that were formed through extreme folding and faulting events in past geologic time (Griffith et al. 1998). About 80 percent of Barge/Traffic Area is found within the Southern Dissected Ridges and Knobs ecoregion. This region contains crenulated, broken, or hummocky ridges, that support chestnut oak and pine forests in the higher elevations and stands of white oak, mixed mesophytic forest, and tulip poplar on the lower slopes (Griffith et al. 1998). The remaining 20 percent of the study area, located in the Bear Creek Valley, lies within the Southern Limestone/Dolomite Valleys and Rolling Hills. Bedrock geology in this heterogeneous region is composed predominantly of limestone and cherty dolomite. Landforms are mostly undulating valleys and rounded ridges with many caves and springs. Land cover in this ecoregion varies and includes forest, pasture, intensive agriculture, and areas of commercial, industrial, and residential development.

Field surveys were conducted in May 2015 to assess the terrestrial community structure, to document infestations of invasive plants, and to search for possible threatened and endangered plant species on the site. Areas representative of each vegetation type present on the Barge/Traffic Area were visited during the survey. Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types found on the Barge/Traffic Area can be classified as a combination of deciduous forest and herbaceous vegetation. No forested areas in the proposed project area had structural characteristics indicative of old growth forest stands (Leverett 1996). The plant communities observed on-site are common and well represented throughout the region.

Deciduous Forest, which is characterized by trees with overlapping crowns where deciduous species account for more than 75 percent of the canopy cover, is the most common vegetation type and covers more than 90 percent of the Barge/Traffic Area. Common overstory species in dry upland forest includes American beech, black gum, chestnut oak, mockernut hickory, red maple, scarlet oak, sourwood, umbrella magnolia, and white oak. The understory consists of flowering dogwood, lowbush blueberry, and mountain laurel. Herbaceous plants were sparse and included Christmas fern, muscadine, and wild yam. Forested wetlands were also present the Barge/Traffic Area. This forest type was located in bottomlands associated with the Clinch River and contained overstory species including American sycamore, black willow, green ash, red maple, and sweetgum. The size of overstory trees in the Barge/Traffic Area varies by stand and ranges from six to 30 inches diameter at breast height.

Herbaceous Vegetation has greater than 25 percent cover of grasses and forbs and occurs on less than 10 percent of the Barge/Traffic Area. Fields and maintained power line right-of-ways account for the vast majority herbaceous vegetation in the project area. Most of these areas are dominated by plants indicative of early successional habitats including many non-native species. Common species in these disturbed areas include Japanese honeysuckle, lobed tickseed, sericea lespedeza, showy goldenrod, Small's ragwort, southern blackberry, and winged sumac. Several small emergent wetlands support a higher proportion of native species including buttonbush, common rush, groundnut, jewelweed, lizard's tail, shallow sedge, silky dogwood, squarrose sedge, and tall false indigo.

Invasive Non-Native Plant Species

Executive Order 13112 defines an invasive non-native species as any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem; and whose introduction does or is likely to cause economic or environmental harm or harm to human health (USDA 2007). Some invasive nonnative plants have been introduced into this country accidentally, but many were brought here as ornamentals or for livestock forage. These robust plants arrived without their natural competitors that tend to keep native plants in check. According to Morris et al. (2004), invasive non-native species are the second leading threat to imperiled native species.

Common invasive plant species occurring within the Barge/Traffic Area include Chinese lespedeza, Chinese privet, Japanese honeysuckle, and Nepalese browntop. These species have the potential to spread rapidly and displace native vegetation and are considered a severe threat in Tennessee (Tennessee Exotic Plant Pest Council 2009). No federal noxious weeds were encountered during field surveys of the Barge/Traffic Area.

Threatened and Endangered Plant Species

A review of the TVA Regional Natural Heritage database indicates that no federally listed plants have been previously reported from within five miles of the Barge/Traffic Area, but two federally listed and one candidate for federal listing have been previously reported from Roane County, Tennessee (Table X). Designated critical habitat for plants does not occur on the Barge/Traffic Area. American Hart's-tongue fern, monkey-face orchid, and Virginia spiraea have very specific habitat requirements and the that do not occur on the site. Federally listed plant species would not be affected by the proposed action.

The TVA Regional Natural Heritage database indicates that seventeen species listed by the state of Tennessee have been reported from within five miles of the Barge/Traffic Area (Crabtree 2014). In preparation for field surveys, the TVA botanist considered the unique habitat requirements of each of the species and used remote sensed data including aerial photos, geologic quadrangles, national wetland inventory data, and topographic maps to identify areas where rare species would be most likely to occur. Specifically, glade/barrens habitat, rich calcareous forest, and forested wetlands were prioritized as areas of interest. Field survey efforts were subsequently focused on locating these habitats to maximize the likelihood that rare plants would be found if present on the property.

Both shining ladies'-tresses (*Spiranthes lucida*) and spreading false foxglove (*Aureolaria patula*) have been previously reported from a small portion of the southern part of the Barge/Traffic Area, just west of the West End Water Treatment facility. The last observation of shining ladies'-tresses and spreading false foxglove on the site have been in the years 2000 and 1991, respectively. May 2015 field surveys of the wetland and associated uplands near the water treatment facility did not relocate individuals of either species; neither currently occurs in the Barge/Traffic Area. State-listed plants would not be affected by the proposed action.

Table X. All plant species of conservation concern previously reported from within five miles of the Barge/Traffic Area as well as candidates for federal listing and federally listed plants reported from Roane County, Tennessee.

Common Name	Scientific Name	Federal Status	State Rank/Status
Earleaf Foxglove	<i>Agalinis auriculata</i>	-	END/S2

American Hart's-tongue fern ²	<i>Asplenium scolopendrium</i> var. <i>americanum</i>	THR	END/S1
Spreading False-foxglove ¹	<i>Aureolaria patula</i>	-	SPCO/S3
River Bulrush	<i>Bolboschoenus fluviatilis</i>	-	SPCO/S3
Tall Larkspur	<i>Delphinium exaltatum</i>	-	END/S2
Branching Whitlow-wort	<i>Draba ramosissima</i>	-	SPCO/S2
Waterweed	<i>Elodea nuttallii</i>	-	SPCO/S2
Godfrey's Thoroughwort	<i>Eupatorium godfreyanum</i>	-	SPCO/S1
Naked-stem Sunflower	<i>Helianthus occidentalis</i>	-	SPCO/S2
Butternut	<i>Juglans cinerea</i>	-	THR/S3
Short-head Rush	<i>Juncus brachycephalus</i>	-	SPCO/S2
Slender Blazing-star	<i>Liatris cylindracea</i>	-	THR/S2
Loesel's Twayblade	<i>Liparis loeselii</i>	-	THR/S1
American ginseng	<i>Panax quinquefolius</i>	-	S-CE/S3S4
Pale Green Orchid	<i>Platanthera flava</i> var. <i>herbiola</i>	-	THR/S2
Monkey-face orchid ²	<i>Platanthera integrilabia</i>	C	S2S3/END
Heller's Catfoot	<i>Pseudognaphalium helleri</i>	-	SPCO/S2
Prairie Goldenrod	<i>Solidago ptarmicoides</i>	-	END/S1S2
Virginia Spiraea ²	<i>Spiraea virginiana</i>	THR	END/S2
Shining Ladies'-tresses ¹	<i>Spiranthes lucida</i>	-	THR/S1S2

Status codes: **C** = Candidate; **END** = Endangered; **SPCO** = Special Concern; **S-CE** =Special Concern-Commercially Exploited; **THR** = Threatened.

Rank Codes: **S1** = Extremely rare and critically imperiled in the state with 5 or fewer occurrences, or very few remaining individuals, or because of some special condition where the species is particularly vulnerable to extirpation; **S2** = Very rare and imperiled within the state, 6 to 20 occurrences; **S3** = Rare or uncommon with 21 to 100 occurrences; **S4** = Apparently secure; **S#S#** = Denotes a range of ranks because the exact rarity of the element is uncertain (e.g., S1S2).

¹ Species of conservation concern previously reported from the Barge/Traffic Area.

² Candidates for federal listing and federally listed plant species previously reported from Roane County, Tennessee, but not from within 5 miles of the Barge/Traffic Area.

Literature Cited

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