

THE OAK RIDGE RESERVATION (ORR) VASCULAR FLORA LIST

This species list is a revision of List 1 in Appendix E of the Resource Management Plan for the Oak Ridge Reservation, Volume 29: Rare Plants on the Oak Ridge Reservation (Cunningham et al. 1985) and was published in Appendix C of the Survey of Protected Vascular Plants on the Oak Ridge Reservation (Awl et al. 1996). More than 100 additional species have been found on the ORR since 1985.

Some species listed in an unpublished report by the Tennessee Valley Authority (TVA) (1950-1953), An Ecological Survey of White Oak Creek, do not appear on the current ORR list because Research Park staff were unable to locate the corresponding herbarium specimens for verification. These specimens are presumed to have been re-filed since they were not found under the species names used in the report. Refiling normally indicates a change in identification. No attempt was made to find the new location of a specimen (i.e., its new identification).

FLORA FIELD DESCRIPTIONS

FAMILY, GENUS, SPECIES, VARIETY

The scientific names (i.e., family, genus, species, and variety) are primarily taken from Wofford and Kral (1993). Gleason and Cronquist (1991) and Radford et al. (1986) were used for the scientific names of the few taxa, indicated in the COMMENTS field, not referenced in that source.

Some taxa do not meet criteria for inclusion in the ORR flora, but they have been included in the list to clarify their status. These ineligible species are marked with an asterisk (*). The ELIGIBILITY field (see below) indicates why these taxa are not included in the ORR flora.

SYNONYM

In some cases synonyms for scientific names are given that might be more familiar to the user than those chosen by our sources. If the synonyms differ only as to genus, then only genus is given in the synonym column.

COMMON NAME

The principal sources used for common names were Great Smoky Mountain Natural History Association (no date [a] and [b]) and Gleason and Cronquist (1991). A standard list of common names is expected to be published soon by John T. Kartesz and Rosemarie Kartesz. Their list may be used in future versions of this flora.

ORR FLORA ELIGIBILITY

The list contains some taxa that are not eligible for inclusion in the ORR vascular flora, but have been retained in the list to clarify their status. These species are marked with an asterisk (*). The column headed ELIGIBILITY indicates why these taxa are not included in the ORR flora:

- el (eligible) = meets criteria for membership in ORR flora (see NOTE below)
- ne (not established) = exotic taxon from horticulture that has not yet shown that it can survive without horticulture

- qr (questionable report) = questionable report of the taxon
- hy (hybrid) = a hybrid that does not seem to be established independently of its parent species
- id (identification) = the identification is questionable
- tax (taxonomy) = there may be confusion in the taxonomy
- pl (previous list) = on Mann et al. (1985) (A Checklist of the Vascular plants of the Department of Energy Oak Ridge Reservation), but currently we do not have evidence in the form of a specimen or a confident report from a botanist for the occurrence of the taxon on the ORR
- ot (ownership transferred) = the location where the taxon was found is outside the current ORR boundary (The ORR boundary has changed due to the transfer of "surplus" land.)
- nt (new taxon) = the taxon has recently been described and is likely to occur on the ORR, but there has not yet been a search for it.

NOTE: The following criteria must be met for inclusion in the ORR vascular flora:

1. The taxon is a vascular plant.
2. Verification exists (see PROOF below) that the taxon occurs within the ORR boundaries as of October 1995. Verification includes herbarium specimens, photographs, and confident reports of botanists. We are in the process of obtaining specimens in cases where the only verification is a confident report.
3. The taxon appears capable of maintaining itself indefinitely without horticultural support (i.e., it is a natural occurrence). The list does not include many of the taxa currently used for plantings around buildings or taxa that were planted originally at homesteads but are gradually dying out as the homestead sites return to natural vegetation.
4. The taxonomic identification of the specimen is accepted. The identification of a specimen may be tentative in several ways: a) the quality of the available specimen is inadequate, b) a botanist with expertise in the taxa and able to confirm the identification has not yet been located, or c) the material cannot be clearly identified because it may represent plants unidentifiable by available taxonomic literature (e.g., the material is from a hybrid, diseased, or undescribed plant).
5. The taxon is valid. For example, a taxon may be invalid if it is distinguished from other taxa based on environmentally determined (rather than genetically determined) characters. We try to follow expert opinion as to validity, but the experts do not always agree.

PROOF

This column lists the verification for the occurrence of each taxon on the ORR:

- ORRH = specimen in the ORR herbarium
- ORRHv = only specimen stored in the ORR herbarium vault
- ORRHs = specimen in a special collection at the ORR herbarium (i.e., not filed with general specimens)

- TENN = specimen in the University of Tennessee - Knoxville (UTK) herbarium
- US = specimen in the Smithsonian Institution herbarium
- DU = specimen in the Duke University herbarium
- P = photographs in the ORR National Environmental Research Park office and in the herbarium
- r (report) = reported with confidence by a botanist

CONTAMINATED SPECIMEN

This column indicates taxa that are contaminated with radioactive material. These specimens are sequestered in a vault adjacent to the ORR herbarium at Bldg. 0907.

c = contaminated

COMMENTS

This field indicates species which are not included in Wofford and Kral (1993), a source which attempts to list all species naturally occurring in Tennessee. The source used for these species is given in this field. This field also indicates species which are rare in Tennessee and/or East Tennessee (i.e., east of the central basin), based on range maps in Chester et al. (1993) and unpublished range maps kept in the University of Tennessee herbarium.

ADD YEAR, SOURCE

These fields indicate records added since 1993, with the year of entry (ADD YEAR) and the initials of the person who added the record (SOURCE).

L.P. = Larry Pounds

TN NATIVE VS. EXOTIC

This column indicates whether the taxon is considered to be native or exotic in Tennessee according to Wofford and Kral (1993), with changes as found on the University of Tennessee Herbarium's Web site (<http://tenn.bio.utk.edu/index.html>).

Wofford and Kral do not define native in this 1993 work. Native to Tennessee might be defined as occurring naturally in Tennessee previous to the influence of European culture and not solely in Native American cultivation. Taxa may be native to Tennessee but not to East Tennessee or the ORR (e.g., bald cypress). Such taxa are not differentiated in the list. In many cases direct evidence of pre-European occurrence is lacking, and the conclusion is a best guess.

Exotic is taken to mean not native. Aggressive vs. passive was determined based on the field experience of ORR Research Park botanical staff.

- n (native) = native to TN (may not be native to the ORR)
- a (exotic aggressive) = not native, observed to exclude native species on the ORR

- a? (exotic aggressive questionable) = not native, not yet observed to exclude native species, but has characteristics that make it likely to become a problem in the future
- p (exotic passive) = not native, not observed to exclude or expected to exclude native species
- p? (exotic passive questionable) = not native, not observed to threaten native species, but information is lacking
- ? (exotic) = not native, but no information available on the threat to native species

FREQUENCY (ORR)

This field indicates the approximate frequency of occurrence of each taxon on the ORR as estimated by Research Park staff based on field experience. Except for rare species, frequencies for taxa are subjective. Question marks are used with the codes to indicate a higher degree of uncertainty. The frequency codes are a modification of those used by the Great Smoky Mountains Natural History Association in *Flowering Plants of the Great Smoky Mountains National Park* (no date [a]).

- c (common) = found regularly in common habitats
- f (frequent) = found somewhat irregularly in common habitats
- o (occasional) = found at 14 to 20 sites
- i (infrequent) = found at 9 to 13 sites
- s (scarce) = found at 4 to 8 sites
- r (rare) = found at 2 or 3 sites or at one site with more than 20 individuals
- vr (very rare) = found at 1 site with less than 20 individuals
- ? (status uncertain) = higher than normal level of uncertainty, more information needed

TN LISTED

This column lists the status assigned to the taxon by the Tennessee Department of Environment and Conservation. Codes and code assignment to species are taken from an unpublished Tennessee Department of Environment and Conservation list (1994).

TN code:

- S = special concern
- T = threatened
- E = endangered
- E* = endangered due to commercial exploitation
- P = possibly extirpated from Tennessee (records are historical [not current])

U.S. LISTED

This column lists the status assigned to these taxa by the U.S. Fish and Wildlife Service (1993).

- SpC (species of concern) = a second priority level candidate for federal listing under the Endangered Species Act (formerly called a C2 [candidate level 2] species)
- 3C = a species which was a candidate for listing but did not achieve listing and is no longer considered a candidate for listing

R2IND (WETLAND INDICATOR STATUS), ORRIND (ORR alternative wetland indicator)

The U.S. Fish and Wildlife Service (Reed 1988) has developed a classification system that assigns species to wetland indicator classes according to the frequency with which these species occur in a wetland. These indicators are used to establish the hydrophytic vegetation criterion for identification and delineation of jurisdictional wetlands (U.S. Army Corps of Engineers 1987).

"R2IND" refers to the indicator (IND) that has been assigned to the species in EPA Region 2 (R2), which includes most of the southeastern U.S. A species that is considered to be an upland species in all regions of the U.S. is not included on this list. This creates a problem in interpreting this list, because species found on the ORR and not found in Reed (1988) may be upland or they may not be treated by Reed and, thus, may have a status other than upland. In these cases a judgment was made by Research Park staff. If the species appeared to be an upland species, it was given that code in the column. If not, a question mark (?) was placed in that column, and in some cases a wetland indicator code was given by the staff for the species as seen on the ORR in another column (ORRIND). In a few cases observations on the ORR did not agree with the indicator code assigned by Reed. These disagreements are indicated by alternative indicator codes in the ORRIND column.

If a species is not listed in Reed (1988), it is generally assumed to be an upland species. If the species appears to exist in only xeric, upland situations on the ORR, the UPL indicator was placed in the R2IND column. However, some of these species have routinely been found in wetland conditions on the ORR. In this case a question mark has been placed in the R2IND column, and an unofficial indicator status for the species has been placed in the ORRIND column, based on the professional judgment of the Research Park Staff. The ORRIND column also includes alternative indicators for some species for which field observations were not in agreement with the indicator listed by Reed. The ORRIND column should be considered preliminary and should not be used in conducting wetland determinations.

These codes and their assignment are taken from Reed (1988) except for "?" and in some cases for UPL. (See previous paragraph.) Percents indicate the probability that the species will occur in a wetland (wetland fidelity or frequency).

- UPL (upland) = <1% wetland fidelity.
- FACU (facultative upland) = wetland fidelity in the range 1 to 33%
- FACU- (facultative upland -) = wetland fidelity in the lower part of the range 1 to 33%
- FACU+ (facultative upland +) = wetland fidelity in the upper part of the range 1 to 33%
- FAC (facultative) = wetland fidelity in the range 34 to 66%
- FAC- (facultative -) = wetland fidelity in the lower part of the range 34 to 66%

- FAC+ (facultative +) = wetland fidelity in the upper part of the range 34 to 66%
- FACW (facultative wetland) = wetland fidelity in the range 67 to 99%
- FACW- (facultative wetland -) = wetland fidelity in the lower part of the range 67 to 99%
- FACW+ (facultative wetland +) = wetland fidelity in the upper part of the range 67 to 99%
- OBL (obligate) = >99% wetland fidelity
- NI (no indicator) = no indicator was assigned because of insufficient information
- NO = not believed to be found in Region 2 by Reed
- NA = no indicator status assigned because of lack of agreement among those polled
- ? = the taxon was not found in Reed (1988), but it does not appear to be an upland species (UPL)

TAXONOMIC GROUPING

Taxa are broken down into the following general groups:

- fern ally
- fern
- gymnosperm
- monocot
- dicot

LIFE SPAN

This field indicates whether a species is an annual, biennial, perennial, or a combination of these. Information was compiled from the USDA Soil Conservation Service (SCS) (1982), Gleason and Cronquist (1991), and the National PLANTS Database (USDA NRCS 1995 or the Web version at <http://plants.usda.gov/>). If the USDA Soil Conservation Service (1982) and Gleason and Cronquist (1991) disagreed, information from Gleason and Cronquist was used with a question mark. Reproductive schedule within a species may vary with variety, seasonal weather conditions, and/or geographical region.

- A (annual) = a plant that reproduces and dies after one year (one reproductive period)
- B (biennial) = a plant that reproduces and dies after two years (one reproductive period)
- P (perennial) = a plant that lives more than two years (usually more than one reproductive period)
- AB (annual, biennial) = a plant that can grow as either an annual or a biennial
- ABP (annual, biennial, perennial) = a plant that can grow as an annual, biennial, or perennial

- AP (annual, perennial) = a plant that can grow as an annual or perennial
- BP (biennial, perennial) = a plant that can grow as a biennial or perennial

STRATA

This column separates herbaceous (coded as grasslike, vine, or forb) plants from woody plants and divides the woody plants by growth form. The classification of woody plants used in *Trees of the Great Smoky Mountains* (Great Smoky Mountains Natural History Association, no date [b]) has been followed with an additional code, h = hemishrub, taken from USDA SCS (1982). The decision as to which code to use for a species was influenced by observations on the ORR.

- ct = canopy tree
- ut = understory or small tree
- sh = shrub
- ss (sub-shrub) = very small shrub (normally less than 30 cm high and often not of typical shrub form, sometimes not obviously woody)
- wv = woody vine
- hs (hemishrub) = some woodiness at the base of the plant (suffrutescent)
- gr (grasslike) = a grass, sedge, or rush
- fo (forb) = an herbaceous plant that is not grasslike (gr) or a vine (v)
- hv = herbaceous vine

SYMBIOSIS

This column indicates plants with special features. Information was compiled from the USDA Soil Conservation Service (1982), Gleason and Cronquist (1991), and the National PLANTS Database (USDA NRCS 1995). If the USDA Soil Conservation Service (1982) and Gleason and Cronquist (1991) disagreed, information from Gleason and Cronquist was used with a question mark.

- E (epiphyte) = a plant growing on a tree which does not have roots in the ground or in the living part of the tree
- P (parasite) = a plant that gains all or a significant amount of its nutrition from another vascular plant by root penetration (e.g., mistletoe is not considered to be an epiphyte but rather a parasite)
- M (mycotroph) = a plant that gains most of its nutrition from association with a fungus (in certain cases loosely called saprophytic)

AQUATIC HABIT

This column indicates plants with special features. Information was compiled from the USDA Soil Conservation Service (1982), Gleason and Cronquist (1991), and the National PLANTS Database (USDA NRCS 1995). If the Soil Conservation Service (1982) and Gleason and Cronquist (1991) disagreed, information from Gleason and Cronquist was used with a question mark.

- S (submersed) = a plant that is normally entirely under water
- E (emergent) = a plant normally growing in water with part of the plant above the water
- FL (floating) = a plant normally growing in water with part or all of the plant floating at the water surface (some are rooted in soil below the water)
- ES (emergent, submersed) = a plant normally growing either entirely under water or with part of the plant above the water

US-CAN

This column indicates whether a species is native to the U.S. and Canada. Abbreviations used are as follows:

- I = introduced (based on National List of Scientific Plant Names [USDA SCS 1982])
- In = introduced (based on Gleason and Cronquist [1991] where it disagrees with National List of Scientific Plant Names [USDA SCS 1982])
- N = native (based on National List of Scientific Plant Names [USDA SCS 1982])
- Na = native (based on Gleason and Cronquist [1991] where it disagrees with National List of Scientific Plant Names [USDA SCS 1982])
- N&I = native and introduced (based on The PLANTS Database [USDA NRCS 1995] Web version [<http://plants.usda.gov/>])

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