

Additions to the Known Vascular Flora of Land Between The Lakes National Recreation Area, Kentucky and Tennessee

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Abstract—Land Between The Lakes National Recreation Area (LBL) encompasses 68,800-ha in southwestern Kentucky and northwestern central Tennessee. Established in 1963 and managed for outdoor recreation, environmental education, and historic interpretation, LBL currently receives more than 1.4 million visitors yearly. Administration was by the Tennessee Valley Authority until 1999 when the U.S. Forest Service assumed control. The area is mostly upland secondary forests and successional fields surrounded by the impounded Tennessee River (Kentucky Reservoir) on the west, the impounded Cumberland River (Barkley Reservoir) on the east, and a man-made canal connecting the two reservoirs on the north. Prior to public ownership, the area was mostly rural with a population of about 5000; all were required to vacate. The numerous farms, churches, and other privately-owned properties were federally-purchased and all structures relocated or destroyed. A 24,282-ha National Wildlife Refuge also was relocated. Floristic studies since 1964 have resulted in three checklists of vascular plants, the most recent in 2003 reporting 1334 taxa. This report provides information on an additional 36 taxa, of which 25 are native and 11 introduced.

Introduction

Land Between The Lakes National Recreation Area (LBL) is a 68,800-ha tract in southwestern Kentucky (parts of Lyon and Trigg Counties) and northwestern central Tennessee (part of Stewart County). The area is essentially an inland peninsular between the Cumberland River (impounded in 1966 forming Lake Barkley) on the east and the Tennessee River (impounded in 1944, forming Kentucky Lake) on the west. A man-made canal connects the reservoirs and forms the north boundary, resulting in more than 480 km of undeveloped shoreline. The southern boundary approximates Highway 79 between Dover and Paris Landing.

LBL was established in 1963 from lands previously in small farms (row crops, livestock, hay, timber) and communities (homes, stores, churches). All buildings were relocated or destroyed and the population of about 5000 required to vacate. A 24,282-ha National Wildlife Refuge on the Cumberland River also was relocated since most of the Refuge would be inundated by the future Lake Barkley. Nearly 300 cemeteries, ranging in size from a few to several hundred graves per site, are in various stages of maintenance and frequently are the only indication of previous occupation.

The topography is mostly upland with ridges and deep ravines. A north-south ridge (geologically the Tennessee Ridge) separates the Cumberland and Tennessee River drainage systems and provides a major thoroughfare referred to as the Woodlands Trace in deference to former usage by wildlife, Native Americans, and settlers. Most riverine bottomlands, formerly the most productive agricultural lands in the area, were inundated by the reservoirs.

Vegetation today is mostly upland secondary forests dominated by several species of oaks (*Quercus*), and succes-

sional fields. A few high bluffs and slopes above the reservoirs, barren remnants, and mesic north-facing slopes with outcrops add to floristic diversity. Reservoir drawdowns of about 1.5 meters, normally beginning in early August and continuing until early spring, exposes large mud/sand flats that support a unique, mostly temporal flora.

LBL was administered by the Tennessee Valley Authority until 1999 when the USDA Forest Service assumed control. Current management includes timber harvesting (except in designated natural areas) and prescribed burning with the hopes of grassland restoration. Some creek bottomland fields are leased for cultivation in corn, soybeans, and hay, and some upland and low fields are maintained open by mowing and burning. A large enclosed pasture in Stewart County supports a herd of American bison, and a similar enclosure with a drive-through road in Trigg County provides space for a herd of bison and elk. Environmental and historical interpretation facilities include a nature center, planetarium, an extensive schedule of guided science and natural history tours, and a working 1850s farmstead. Recreational facilities include a wrangler's camp, off-road vehicle area, developed and undeveloped campgrounds, more than 800 km of hiking and bicycle trails, hunting for small and large game, and reservoir access for fishing. A detailed account of the area, including floristic, faunistic, geological, descriptive and historical data, was provided by Chester and Fralish (2002).

The vascular flora has been studied extensively since 1964, resulting in three checklists. Ellis et al. (1971) prepared the initial list of 799 taxa, Chester (1993) listed 1310 taxa in a second, and 1334 taxa in a third (Chester, 2003). These lists were based on extensive field work and herbarium studies in all regional and some national herbaria. Since the third checklist, published additions include four species by Thompson and

Poindexter (2006), 14 by Chester (2008), one by Boone and Chester (2009); and five by Chester (2010).

An eventual fourth checklist will address additions, deletions, numerous nomenclatural changes, taxonomic revisions, error corrections, and family realignments. Pursuant to that checklist, it seems prudent to summarize additional records since 2003 (exclusive of those records noted above), thus providing current information for those interested in the LBL flora as well as a reliable list for other researchers who need to compare floristic data from separated areas.

Methods

The additions reported here were obtained from several sources, including the results of (1) field studies by several botanists involved with various research projects; (2) evaluating and correcting identifications of previous collections, some predating public ownership; and (3) annotations by specialists of herbarium specimens representing several taxonomic groups. Taxa listed as elements of conservation concern were taken from the Kentucky Rare Plant Database (2015) and the Tennessee Department of Environment and Conservation, Natural Heritage Program (2014). Nomenclature follows the Tennessee Flora Committee (2015).

Results and discussion

Thirty-six taxa are reported as additions to the known flora of LBL; 11 of these are introduced. Three taxa from Stewart County are listed elements in Tennessee, including: *Carex hyalinolepis* (threatened), *Pedicularis lanceolata* (special concern), and *Solidago rupestris* (endangered). Three taxa from Kentucky are listed, including *Coreopsis pubescens* (Trigg Co., special concern), *Muhlenbergia bushii* (Lyon Co., endangered), and *Vallisneria americana* (Lyon Co., special concern). Information on the statewide distribution and habitat preference of all species may be found in Jones (2005) and Campbell and Medley (2012) for Kentucky, and The Tennessee Flora Committee (2015) for Tennessee.

In the following list, families are alphabetical with information for each species sequenced as: taxon (preceded by an asterisk if non-native), vernacular, general habitat information for LBL, date of collection, collector(s), collection number, deposition of vouchers as: APSC (Austin Peay State University), ECU (Eastern Kentucky University, Richmond), TENN (University of Tennessee-Knoxville), and VDB (Vanderbilt University collection at BRIT).

AMARANTHACEAE

Amaranthus palmeri* S.Watson, Palmer's Amaranth or Careless Weed. Weedy pastures in the bison range near the former community of Model, also becoming a weed in soybean fields. **Stewart Co.: 3 September 2008, Chester 14774 (APSC, TENN); 25 September 2015, Chester 14915 (APSC, TENN).

ASTERACEAE

Coreopsis pubescens Ell., Star Tickseed. Weedy thickets along streams. **Trigg Co.:** 12 July 2008, Chester 14755, with D. Estes and C. Fleming (APSC); 11 August 2008, Chester 14766 (APSC, ECU).

Nabalus crepidineus (Michx.) A.DC., Nodding Rattlesnake Root. Low woods on the west side of Bee Creek near junction with Bear Creek. **Stewart Co.:** 17 September 2011, Chester 14840 (APSC-3 sheets, TENN). Rosettes were observed in the heavily wooded riparian forest for at least 30 years but never flowering until transplanted into an open area in 2011.

Silphium glabrum Eggert ex Small, Smooth Rosinweed. Mesic to dry roadsides, fields, barrens, occasionally in open woods. Includes material given in previous checklists as *Silphium integrifolium* Michx., *S. astericus* L., and *S. trifoliatum* L., based on annotations by Guy Nesom (BRIT). There are several collections at APSC, only one cited from each county. **Lyon Co.:** 13 July 1987, Chester 87-462. **Stewart Co.:** 1 July 1986, Chester 86-421. **Trigg Co.:** 23 August 1984, Chester 84-367.

Solidago rupestris Raf., Rock Goldenrod. Weedy banks of Lake Barkley near boundary of Bear Creek Waterfowl Management Area. **Stewart Co.:** 30 August 2014, Chester 14865 (APSC, TENN). Identification of the weak-stemmed and straggling plants based on comparison with material from similar habitats in adjacent Montgomery County that were examined by the late Dr. A. Cronquist.

BORAGINACEAE

Myosotis stricta* Link ex Roem. & Schult., Strict Forget-Me-Not. Sunny banks along Highway 68 just east of the Egner's Ferry Bridge over Kentucky Lake and in adjacent low meadows. **Trigg Co.: 16 April 2008, Chester 14735 (APSC, ECU, TENN); 16 April 2010, Chester 14808 (APSC).

BRASSICACEAE

Alliaria petiolata* (Bieb.) Cavara & Grande, Garlic Mustard. Weedy edges of agricultural fields in creek bottomlands. **Trigg Co.: 25 May 2012, Chester 14846 (APSC, ECU). Presently known from one site in LBL but an aggressive weed elsewhere with potential for becoming weedy in LBL.

Thlaspi alliaceum* L., Roadside Penny-Cress. Roadsides, fallow creek bottomland agricultural fields. **Stewart Co.: 12 April 2008, Chester 14732 (APSC, TENN). Rare in LBL but often weedy on roadsides and in adjacent fields elsewhere with potential for becoming weedy in LBL.

CANNABACEAE

Cannabis sativa* L., Marijuana. Waif around a public use and camping area on the banks of Lake Barkley. **Trigg Co.: 2 November 2007, Chester 14731 (APSC). Cultivated across KY and TN in clandestine places, rarely appearing from seed around places of cultivation and in campgrounds and picnic areas.

CARYOPHYLLACEAE

Stellaria corei Shinnars, Tennessee Chickweed. Low woods in the Bear Creek Natural Area. **Stewart Co.:** 5 May 2014, Chester 14861 (APSC, TENN). The floristically rich Bear Creek Natural Area is the only known site for this species in LBL, but it is possibly overlooked elsewhere or confused with the more common *S. pubera*.

CONVOLVULACEAE

Calystegia catesbeiana Pursh, Catesby's False Bindweed. Roadsides, fields, disturbed woods. **Stewart Co.:** 17 May 1988, Chester 88-51 (APSC). **Trigg Co.:** 20 May 1967, Phillips and

Wallen 2748 (APSC). Originally identified as *Convolvulus sepium* L., annotated by D. Estes.

Calystegia silvatica (Kit.) Griseb. ssp. *fraterniflorus* (Mack. & Bush) Brummitt, Shortstalk False-Bindweed. Roadsides, mesic fields, thickets, disturbed woods. **Stewart Co.:** 21 June 1989, Chester 192 (APSC). **Trigg Co.:** 2 July 1985, Chester 85–381 (APSC). Originally identified as *Convolvulus sepium* L., annotated by D. Estes.

CYPERACEAE

Carex hyalinolepis Steud., Shoreline Sedge. Swampy fields and woods, sometimes in shallow water, mostly along Kentucky Reservoir and more often in northern LBL counties. There are several collections at APSC, only one cited from each county. **Lyon Co.:** 8 May 1991, Chester 91-7, with Jerry and Carol Baskin (also at TENN, VDB at BRIT). **Stewart Co.:** 13 May 1996, Chester 13168). **Trigg Co.:** 14 June 1989, Chester 89–273. Originally identified as *Carex lacustris* Willd., which apparently does not occur in Tennessee (Tennessee Flora Committee 2015).

Carex kraliana Naczi & Bryson, Kral's Sedge. Mesic to rather dry woods. **Lyon Co.:** 17 May 1986, Chester 86–176 (APSC); **Stewart Co.:** 4 May 1998, Chester 13273 (APSC, TENN). Originally identified as *C. blanda* Dewey, annotated by D. Estes.

Carex oklahomensis Mack., Oklahoma Sedge. Wet meadows formed by beaver activity. **Stewart Co.:** 12 July 2008, Chester 14752, with D. Estes and C. Fleming (APSC). Identification D. Estes.

FABACEAE

Sesbania exaltata (Raf.) Rydb ex Hill, River Hemp. Known only from sandy shoreline of Barkley Reservoir. **Trigg Co.:** 11 August 2008, Chester 14767 (APSC-2 sheets, ECU). Mostly found west of the Tennessee River in both states.

HYDROCHARITACEAE

Hydrilla verticillata* (L.f.) Royle, Hydrilla. Kentucky Reservoir, often forming large mats in shallow water and in outwash along dewatered shorelines. **Stewart Co.: 15 October 2007, Chester 14730 (APSC, TENN); 10 September 2008, Chester 14776 (APSC, TENN); 29 December 2008, Chester 14787 (APSC, TENN). **Trigg Co.:** 24 July 2007, Chester 14715 (APSC, ECU).

Vallisneria americana Michx., American Eel-Grass. Shallow water of Kentucky Reservoir, sandy substrate. **Lyon Co.:** 17 September 2008, Chester 14780 (APSU-2 sheets, ECU).

HYPERICACEAE

Hypericum lobocarpum Gattinger, Five-Lobe St. Johnswort. Along creeks and in moist-wet areas around beaver ponds. **Trigg Co.:** 12 July 1989 Chester 89–289 (APSC), originally identified as *H. prolificum*, annotated by D. Estes; 16 July 2013, Dattilo s.n. (APSC). Appreciation extended to Adam Dattilo, Tennessee Valley Authority, for providing the second cited voucher.

Hypericum frondosum Michx., Cedar Glade St. Johnswort. Bluffy woods by Lake Barkley (Cumberland River). **Stewart Co.:** 10 August 1966, Evans 2368 (APSC). Originally identified as *H. prolificum* and not observed in LBL since the original collection.

JUNCACEAE

Juncus anhelatus (Wieg.) Brooks, Poverty Rush. Sandy, low meadows, sometimes in fallow agronomic fields. **Stewart**

Co.: 3 June 1967. Riggins 129; 9 June 1986. Chester 86-261, 9 June 1986. Chester 86–271 (all vouchers at APSC). Originally identified as *J. tenuis* Willd., annotated by Wes Knapp, Maryland Natural Heritage Program.

Juncus canadensis J.Gay ex Laharpe. Canada Rush. Bottomland wet fields and meadows. **Stewart Co.:** 9 May 1980, Stack 1150, with E.W. Chester and J. Carpenter (APSC). Originally identified as *J. marginatus* Rostk., annotated by Wes Knapp, Maryland Natural Heritage Program.

LAMIACEAE

Mosla dianthera* (Buch.-Ham.) Maxim., Miniature Beefsteak Plant. Homesites, weedy fields, along trails. **Stewart Co.: 29 October 2010, Chester 14821 (APSC, TENN), 14 September 2012, Chester 14866 (APSC, TENN), 17 September 2014, Chester 14866 (APSC). Appears to be a recent introduction and spreading in LBL.

MELASTOMACEAE

Rhexia mariana L. var. *interior* (Pennell) Kral & Bostk., Maryland Meadow Beauty. Wet meadows, mostly in weedy bottomlands. **Lyon Co.:** 14 July 1988, Chester and Holt 88-148 (APSC). **Stewart Co.:** 7 August 2015, Chester 14897 (APSC, TENN). **Trigg Co.:** 6 September 2003, Thompson and Poindexter 3-966 (APSC). The Trigg Co. specimen was originally identified as *R. virginica* L.; other Lyon and Trigg Co. specimens were originally reported (Chester, 1993, 2003) as *R. mariana* L. without varietal designation.

OLEACEAE

Forsythia suspensa* (Thunb.) Vahl., Yellowbells. Persisting and slightly spreading at homesites and in cemeteries. **Lyon Co.: 9 April 1987, Chester 87-51 (APSC); 20 July 1987, Chester 87–523 (APSC). **Trigg Co.:** 8 October 1986, Chester 86-1246 (APSC). The previously reported *F. viridissima* Lindl. is more commonly seen persisting and slightly spreading in LBL.

OROBANCHACEAE

Agalinis gattingeri Small, Gattinger's False Foxglove. Dry woods. **Stewart Co.:** 20 September 1942, Shanks 2203, det. A. Clebsch (APSC, TENN). Collection recently determined to be from the area that would become LBL. No recent observations.

Pedicularis lanceolata Michx., Swamp Lousewort. Marshy fields and thickets along Barrett Creek. **Stewart Co.:** 5 October 2007, Chester 14729 (APSC-2 sheets, TENN). Known only from this site in LBL.

OXALIDACEAE

Oxalis illinoensis Schweg., Illinois Wood-Sorrel. Mesic woods, especially around outcrops and in ravines. **Stewart Co.:** 8 May 1966 Riggins s.n., 6 May 1980; Stack 199, 9 May 1987; Chester 87–168 (all at APSC). Specimens originally identified and cited as *O. grandis* Small in previous lists; that species occurs to the east of LBL (Schwegman, 1982; Tennessee Flora Committee, 2015).

POACEAE

Muhlenbergia bushii Pohl, Nodding Muhly. Outer edge of fluctuation zone on banks and bluffs above Kentucky Reservoir. **Lyon Co.:** 8 October 1987, Chester 87–855 (APSC).

Originally identified as *M. frondosa* (Poir.) Fern., annotated by J. Campbell.

PHRYMACEAE

Mazus pumilus* (Burm.f.) Steenis, Japanese Mazus. Often abundant on reservoir dewatered zones and in fallow bottomland fields near reservoirs, especially Barkley, in early spring. **Lyon Co.: 30 March 2012, Chester 14842 (APSC, ECU). **Stewart Co.:** 8 June 2011, Chester 14829 (APSC, TENN); 20 March 2012, Chester 14841 (APSC, TENN). **Trigg Co.:** 10 April 2007, Chester 14710 (APSC, ECU). Also reported from the lawn of LBL Nature Center in Lyon Co. (Abbott and Thompson, 2015).

PLANTAGINACEAE

Veronica peregrina L. ssp. *xalapensis* (H.P.K.) Pennell, Hairy Neckweed. Fallow agronomic fields, wet meadows. **Lyon Co.:** 13 April 1967, Phillips and Wofford 2669 (APSC). Originally identified as *V. arvensis*, annotated by D. Estes. **Stewart Co.:** 1 May 1975, Chester 2951 (APSC). Originally identified as *V. peregrina* without varietal designation, annotated by D. Estes.

RANUNCULACEAE

Clematis pitcheri Torr. & A. Gray, Pitcher's Leather Flower. Thickets and open woods around limestone outcrops. **Lyon Co.:** 7 July 1986, Chester 86-479 (APSC), originally identified as *C. viorna*, annotated by J. Campbell.

Clematis versicolor Small, Pale Leather-Flower. Bottomland thickets near Lake Barkley south of Bear Creek. **Stewart Co.:** 23 September 1983, Chester 83-387 (APSC). Originally identified as *C. virginiana* L., annotated by E.W. Chester and D. Estes.

ROSACEAE

Kerria japonica* (L.) DC., Japanese Rose. Persisting and slightly spreading in open woods and thickets around a former homesite. **Lyon Co.: 19 April 2011, Chester 14824 (APSC, ECU).

Rubus bifrons* Vest ex Tratt., European Blackberry. Naturalized in thickets near Kentucky Reservoir. **Stewart Co.: 30 July 2002, Chester 14547-3 sheets (APSC); 20 May 2015, Chester 14885 (APSC, TENN). Listed as *R. discolor* Weiche & Nees by Chester (2010).

VIOLACEAE

Viola palmata L. Palmate-Leaved Violet. Mesic to dry woods, clearings, thickets. Includes specimens formerly referred to as *V. triloba* Schwein var. *triloba* and var. *dilatata* (Ell.) Brainerd, based on annotations by Landon McKinney. There are several collections at APSC, only one cited from each county cited. **Lyon Co.:** 24 April 1986, Chester 86-70. **Stewart Co.:** 18 April 1987, Chester 87-68. **Trigg Co.:** 24 April 1987, Chester 87-101.

Literature Cited

- Abbott, J. R., and R. L. Thompson. 2015. Addendum to the vascular flora of the Hancock Biological Station, Murray State University, Calloway County, Kentucky, USA. *Journal of the Botanical Research Institute of Texas* 9: 229-233.
- Boone, D., and E. W. Chester. 2009. Noteworthy collections, Kentucky. *Castanea* 74: 435-436.
- Campbell, J., and M. Medley (with numerous contributing authors). 2012. The atlas of vascular plants in Kentucky. www.bluegrasswoodland.com.
- Chester, E. W. 1993. Vascular flora of Land Between The Lakes, Kentucky and Tennessee: an updated checklist. *Journal of the Tennessee Academy of Science* 68: 1-14.
- Chester, E. W. 2003. The vascular flora of Land Between The Lakes, Kentucky and Tennessee: A third checklist. Pp. 149-218 in: Lyle, L. I., E. W. Chester, and A. F. Scott (Editors). Proceedings of the Tenth Symposium on the Natural History of Lower Tennessee and Cumberland River Valleys. The Center for Field Biology, Austin Peay State University, Clarksville, TN. www.apsu.edu/field-biology/center.
- Chester, E. W. 2008. Some vascular plant records for Land Between The Lakes National Recreation Area, Kentucky and Tennessee. Pp. 41-44 in: Rothermel, B. B., A. N. Barrass, L. D. Estes, and S. W. Hamilton. Proceedings of the 12th Symposium on the Natural History of Lower Tennessee and Cumberland River Valleys. The Center of Excellence for Field Biology, Austin Peay State University, Clarksville, Tennessee. www.apsu.edu/field-biology/center.
- Chester, E. W. 2010. The woody flora of Land Between The Lakes, Kentucky and Tennessee - a revised checklist. Pp. 45-57. In: Hamilton, S. W., A. F. Scott, and L. D. Estes. Proceedings of the 13th Annual Symposium on the Natural History of Lower Tennessee and Cumberland River Valleys. The Center for Field Biology, Austin Peay State University, Clarksville, Tennessee. www.apsu.edu/field-biology/center.
- Chester, E. W., and J. S. Fralish (eds.). 2002. Land Between The Lakes: Four Decades of Tennessee Valley Authority Stewardship. Miscellaneous Publication Number 16. The Center for Field Biology, Austin Peay State University, Clarksville, Tennessee.
- Ellis, W. H., E. Wofford, and E. W. Chester. 1971. A preliminary checklist of the flowering plants of Land Between The Lakes. *Castanea* 36: 229-246.
- Jones, R. L. 2005. Plant life of Kentucky: an illustrated guide to the vascular flora. University Press of Kentucky, Lexington.
- Kentucky Rare Plant Database. 2015. Kentucky State Nature Preserves Commission. <http://epccpp.ky.gov/nprareplants>.
- Land Between The Lakes Homepage. 2015. www.landbetweenthe lakes.us.
- Schwegman, J. E., 1982. A new species of *Oxalis*. *Phytologia* 50: 463-467.
- Tennessee Department of Environment and Conservation, Natural Heritage Program. 2014. Rare plant list. www.tn.gov/environment/natural-areas.
- Tennessee Flora Committee. 2015. Guide to the vascular plants of Tennessee (editors: E. W. Chester, B. E. Wofford, J. Shaw, D. Estes, and D. H. Webb). The University of Tennessee Press, Knoxville.
- Thompson, R. L., and D. B. Poindexter. 2006. Vascular flora of the Elk and Bison Prairie, Land Between The Lakes National Recreation Area, Trigg County, Kentucky. *Castanea* 71: 104-121.
- The University of Tennessee-Austin Peay State University website. 2015. <http://tenn.bio.utk.edu/vascular>.