

General comments on Land-Between-the-Lakes: government, science and community.

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How can we get a good fair stable balance of interests in management of LBL? I suggest that three basic principles should be used, as in all planning for conservation of natural resources.

A. Teamwork: ensure continual effort to build productive communication among all interested people, with special focus on the ‘natural region’ of LBL. In addition to the core counties, local schools, colleges and universities should be closely involved. It would be useful to organize monthly public field trips for enjoyment, education and ‘citizen science’. These trips, together with occasional indoor meetings, should address central questions such as: What was the original condition before settlement and how is it changing? What mixture of habitats does the community need or want? What management should be done to promote the desired condition?

B. Targets: define clear simple goals for conservation at landscape, habitat and species levels (see next page). Language for these goals should be developed through regular interaction with all interested people. While traditional interests in recreation, wildlife and forestry have often been emphasized in previous planning, there has not been enough synthesis of botanical information. We need to review old land surveys (with ‘witness trees’) and to map the best modern remnants of original woodland (especially sites with rare or ‘conservative’ species).

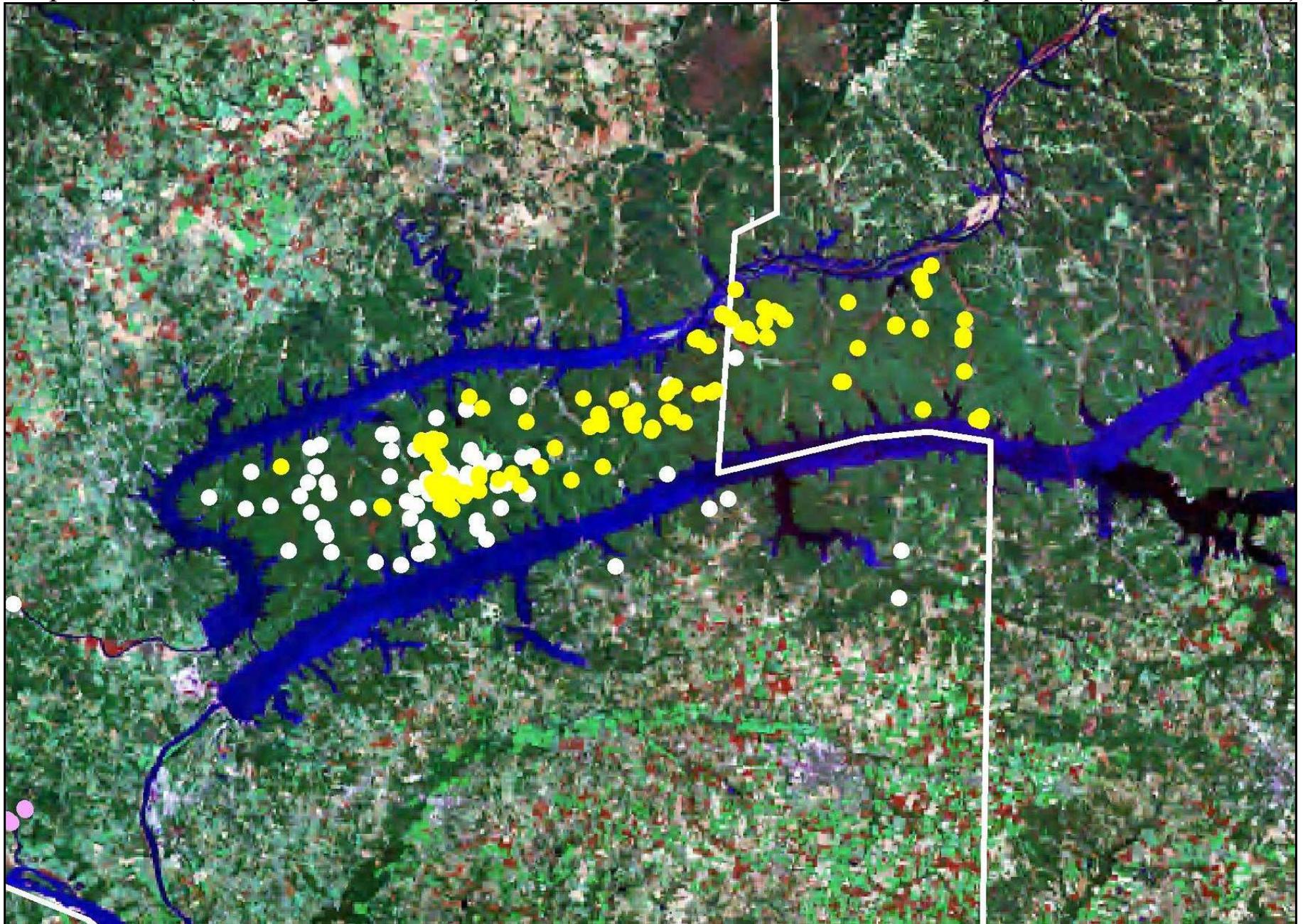
C. Tradeoffs: negotiate careful balance of interests in varied methods to promote agreed targets. Previous planning processes have often led to unresolved controversies. There is no easy solution, other than continued hard work to build good teamwork across the community (A), plus clear simple agreed language for ecological and biological targets (B), plus a fair transparent process for decision-making. These principles are somewhat religious in nature.

Suggested General Goals for Conservation at Land-Between-the-Lakes:

Notes to be developed at my website: bluegrasswoodland.com (“Shawnee Hills+” page).

1. Overall landscape: strengthen and extend general protection for this broad forested corridor along the impounded lower Tennessee and lower Cumberland Rivers (see map overleaf). Restoration of naturalistic conditions should be the primary goal for management of public lands, with commercial logging used only to support restoration.
2. Habitats with special needs for restoration: recovery is slow or absent without human help.
 - 2A. Wetlands. Recovery of beaver populations should be encouraged. Artificial dams, channels and drainage systems in lowland fields should be gradually removed where possible.
 - 2B. Lowlands that have been farmed. These areas should mostly be allowed to reforest with native trees. But, after careful study, selected areas should be maintained as canebrakes or native grassland where naturalistic management with browsing, burning or plowing is useful.
 - 2C. Uplands with remnants of open grassy woods and native grassland. After careful study of where the best remnants are, prescribed burning and browsing should be developed that focuses on true restoration with recovery of rare grassland species. Long-term plans for bison and elk enclosures should be adapted and extended for this purpose, with research on their effects.
3. Groups of species with special needs: recovery is slow or absent without direct human help. These will need more research. Some deserve artificial propagation or other micromanagement.
 - 3A Species of wetlands or their margins (e.g. *Hasteola suavelolens*, *Lysimachia hybrida*).
 - 3B Those of lowland terraces and toeslopes (e.g. *Apios priceana*, *Silphium pinnatifidum*); cane!
 - 3C Those of thin upland woods and grassland (e.g. *Nabalus barbatus*, *Trifolium reflexum*).We can add a few obvious animals, especially elk and bison that must remain in artificial populations but which can be used more for learning how to restore open grassy conditions.

Map of LBL (left to right is N to S); dots show sun-loving conservative plants (white=Baptisia)



Botanical Issues at Land-Between-the-Lakes, Jan 2015 (julian.campbell.twc.com).

(1) Inadequate attention to specific goals for good restoration. Although restoration of “natural” or “presettlement” character is not completely possible, this admirable goal does form a significant component of the current forest plan for LBL. It is depressing then to see that LBL managers do not appear to have reviewed all of the relevant information, and that they depend too much on work of Scott Franklin and James Fralish (now deceased) at Southern Illinois University during 1990-2000. We need a comprehensive update based on all available floristic data (including rare and conservative species in ROWs and old fields), vegetation data (including plot data from recent monitoring of fire effects), historical data (including GLO data from the pioneer era), and a good balanced interpretation (allowing different points of view). It would be very useful to have a regular meeting of scientists and historians to compare notes and guide management. Some of the most knowledgeable people are not involved enough—for example, E.W. Chester (Austin Peay State Univ.) has not been included in the Advisory Board.

(2) Inadequate attention to good restoration of more open areas. Although there is some uncertainty and debate about the amount of open land to maintain at LBL, it is clear that some areas of open grassy woodland used to occur before settlement and that several rare plant species (e.g. buffalo clover, wild quinine, prairie dock) are remnants of that vegetation (mostly in ROWs and a few old fields). Managers have put much effort into cutting or burning several areas across LBL, but there is not enough focus on the relatively few good remnants of open grassy conditions, or on proper restoration in other openings. Specific examples as follows.

- Some of the good remnants documented over 20 years ago have been allowed to grow up into young woods (e.g. one of the best sites reported by W.H. Martin for the LBL symposium).
- The bison-elk area has low floristic quality, with few local species planted.

- The new US 68 corridor has little botanical interest, with too much planting of *Coreopsis lanceolata*, which is not native to this region.
- Some old fields have been planted with local grassland seed (from Roundstone Seed Inc.) but not maintained, allowing trees several inches in diameter.
- The current Pisgah Bay project calls for replacement of alien loblolly pine by open grassy woods with shortleaf pine: not only on ridges—which may be reasonable—but also on lowlands—which is completely unreasonable (given that shortleaf does not occur naturally on such sites).

(3) Inadequate attention to use of “Core Areas” for research, education and guidance of management. Under the original “Man-And-Biosphere” program the Core Areas were supposed to become controls for long-terms comparisons with managed areas, ideally in an experimental context. But without regular scientific meetings, it has been impossible to generate the teamwork needed for such research.

(4) Lack of objective cost/benefit analysis for various management scenarios, including the current state of affairs. We need to determine the complete—financial and biological—costs versus benefits of logging and burning through an objective audit. If USFS tries to burn most of LBL with a 3-5 year cycle (as suggested by recent planning), will they really accomplish this goal? If, as seems more likely, they end up mostly with a patchwork of burns at intervals of 5-10+ years, will the relatively brushy results really be useful for restoration of open grassy conditions—or will they have wasted the effort? Given that proper restoration of open grassy conditions requires burning or browsing at 1-3 year intervals, just how many sites are being managed in this way, and do they include the limited areas with higher biological priority?

Conservative sun-loving (or edge-loving) species on uplands at LBL.

This is a provisional list. Numbers are wildlife openings or fields where species were seen in 2002-2003. Asterisks indicate state-listed species in KY or TN; others are “watchlist” (mostly S3S4); double asterisks are globally rare (G1, G2, G3). See also reports by E.W. Chester.

* <i>Agalinis decemloba</i> (“ <i>obtusifolia</i> ”)	1463/4 [see also Chester’s notes on <i>skinneriana</i>]
* <i>Asclepias hirtella</i>	One report; see Chester (2001)
* <i>Asclepias purpurascens</i>	Chester (2001): “mesic woods/thickets”
* <i>Aster hemisphericus</i>	1350+, 1463/4, 1516/7
<i>Aureolaria pectinata</i>	668
* <i>Baptisia bracteata</i> (including varieties)	266, 359, 364, 365, 388
<i>Croton wildenovii</i>	1463
* <i>Dalea candida</i>	Few sites; see Chester (2001)
* <i>Desmodium</i> cf. <i>nuttallii</i>	1350, 1393+
* <i>Echinacea pallida</i>	One site; see Chester (2001)
* <i>Gymnopogon ambiguus</i>	One site; see Chester (2001)
* <i>Hedeoma</i> cf. <i>hispida</i>	797 (to check id)
<i>Helianthus angustifolius</i>	376, 840, 893, 897+, 926, 970, 1006, 1010+, 1034+, 1110, 1185, 1196+, 1229?, 1308, 1463/4, 1516/7
<i>Helianthus mollis</i>	438/40
<i>Hypericum denticulatum</i>	365, 388, 438/40, 752, 755, 874, 881, 1034+, 1354+, 1463/4, 1516/7
<i>Hypericum hypericoides</i>	881, 914, 926, 1006, 1516/7

<i>Liatris cf. spicata</i>	749/50
<i>Liatris squarrosa</i>	99+, 266, 346 (near), 382, 386/7, 480, 1463/4, 1468+
<i>Liatris squarrulosa</i>	365, 747, 752, 1009, 1013, 1308, 1463/4
* <i>Malus cf. angustifolius/ioensis</i>	1463/4
* <i>Matelea carolinensis</i> (Jacq.) Woodson	[E - Thickets]
* <i>Muhlenbergia glabriflora</i>	Two sites; see Chester (2001)
** <i>Nabalus barbatus</i> (Prenanthes b.)	1351; see also Chester (2001)
<i>Parthenium integrifolium</i>	266, 364, 365, 388, 842/6
* <i>Polytaenia nuttali</i>	One site; see Chester (2001)
<i>Pycnanthemum pilosum</i>	?926, 1372+, 1393+
* <i>Salvia azurea</i> var. <i>grandiflora</i>	365, 489
<i>Silphium integrifolium</i>	382, 749/50, 755, ?756, 897+, 967, 969?, 982, 1010+, 1192, 1308
* <i>Silphium pinnatifidum</i>	797+, 798
** <i>Solidago buckleyi</i>	Chester (2001): “dry upland woods” but thin/edge
<i>Tragia cordata</i>	348+, 428+, 1034+, 1353
** <i>Trifolium reflexum</i>	Dry woods with recent burning, logging, roading; survives occasionally along rocky streams, bluffs
<i>Zanthoxylum americanum</i>	Chester (2001): “dry woods” but thin/edge

Rare species of mesic, submesic or subxeric woods with little opening: see Chester (2001)

Note that several of these still benefit from occasional gaps, edges, trails or other disturbance.

*Aureolaria patula			one old record
**Cimicifuga rubifolia			
Castanea dentata (Marsh.) Borkh., American Chestnut	E	S	Dry woods
*Halesia carolina L., Silverbell	T	-	Mesic woods
Hydrastis canadensis L., Golden Seal	-	S	Mesic woods
*Juglans cinerea L.			[scattered but diseased; esp. edges?]
**Lysimachia fraseri			[1960s records from Stewart Co. in woods]
*Nemophila aphylla (L.) Brumm., Nemophila	T	-	Mesic woods
*Phacelia ranunculacea (Nutt.) Const., Phacelia	S	S	Mesic woods
Populus grandidentata Michx., Large-Tooth Aspen	-	S	Mesic woods
Ulmus serotina Sarg., September Elm	S	-	Bluffy woods

Rare species of lowland terraces and toeslopes: see Chester (2001) for details

Aesculus pavia			
**Apios priceana			Lower edges of woods near valley bottom roads
*Hasteola suaveolens			
*Lesquerella lesquirii			Chester: 2015 abundant in field by S Info. Sta.
*Lilium spp. (canadense, michiganense)			Chester (2001): very few records
*Nabalus crepidineus			
*Trepocarpus aethusae Nutt., Trepocarpus	T	-	Lakeshore thickets/woods

Rare species of wetlands and margins (including beaver swamps): see Chester for details

* <i>Armoracia aquatica</i> (Gray) Al-Sh. & Bates, Lake Cress	T	S	Aquatic
* <i>Carex comosa</i> Boott, Bearded Sedge	H	T	Aquatic
* <i>Carex lacustris</i> Willd., Lake-Margin Sedge	-	T	Aquatic
* <i>Heteranthera dubia</i> (Jacq.) MacM., Water Stargrass	S	-	Aquatic
* <i>Heteranthera limosa</i> (Sw.) Willd., Mud Plantain	S	T	Aquatic
* <i>Hottonia inflata</i> Ellis, Featherfoil	-	S	Aquatic
* <i>Iris brevicaulis</i> Raf., Lamance Iris	-	E	Semi-aquatic-lakeshores
* <i>Liparis loeselii</i> Rich., Fen Orchid	T	E	Beaver swamps
* <i>Najas gracillima</i> (Braun) Magnus, Slender Naiad	S	-	Aquatic
* <i>Oldenlandia uniflora</i> L., One-Flowered Sweet-Ear	E	-	TN River mudflats
* <i>Paspalum boscianum</i> Flugge, Bull-Grass	S	-	Riverbank thickets
* <i>Ptilimnium capillaceum</i> (Michx.) Raf., Mock Bishop's Weed	T	-	Lakeshores
* <i>Ptilimnium nuttallii</i> (DC.) Britt., Mock Bishop's Weed	E	-	Lakeshores
* <i>Ranunculus flabellaris</i> Raf., Yellow Water-Crowfoot	-	T	Aquatic
<i>Sagittaria brevirostra</i> M.&B., Shorted-Beaked Arrowhead	-	T	Aquatic
* <i>Sagittaria graminea</i> Michx., Grass-Leaf Arrowhead	T	T	Aquatic (Golden Pond)