Evergreen Vines in Deciduous Woods and the Herbivore Hypothesis for Bluegrass Woodland

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Evergreen vines form a major class of invasive plants, especially in eutrophic woodland (Bluegrass etc)

Mammalian herbivory appears to be critical for their control—and much other native biodiversity!

We desperately* need to experiment with livestock in restoration (at Griffith Woods, BGAD etc.)


Evergreen Vines in Deciduous Woods
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Diagram of major gradients in KY forests (not wetlands)

<table>
<tr><th rowspan="2">GRADIENT IN DRYNESS AND DISTURBANCE</th><th colspan="5">pH-RELATED GRADIENT (A: strongly acid to E: circumneuntral)</th></tr>
<tr><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th></tr>
<tr><td>xeric or seral (to subxeric)</td><td colspan="2">PINES, HEATHS
and transitions with
sassafras, persimmon</td><td>Varied mixes
esp. post oak
blackjack o.</td><td colspan="2">RED CEDAR, LOCUSTS
CHERRIES, PLUMS
diverse hawthorns, briars</td></tr>
<tr><td>subxeric or seral (to submesic)</td><td>OAK-
CHESTNUT
(former)</td><td colspan="2">OAK-HICKORY: esp. white oak, black oak, s. red oak; pignut, mockernut, shagbark; local red maple, blackgum</td><td colspan="2">OAK-ASH+
chink. oak
bur oak+</td></tr>
<tr><td>mesic (to submesic or subxeric)</td><td>HEMLOCK
BIRCHES
+</td><td colspan="2">BEECH, SUGAR MAPLE
TULIP, BUCKEYES, BASSWOODS
and drier transitions with n. red oak</td><td colspan="2">BLACK
MAPLE
+</td></tr>
<tr><td>riparian (to mesic)</td><td>absent
or rare</td><td colspan="2">RIVER BIRCH,
SYCAMORE
shrubby willows</td><td colspan="2">BOX ELDER, SILVER
MAPLE, SYCAMORE
local willow, cottonwood</td></tr>
<tr><td>subhydric</td><td>absent
or rare</td><td colspan="2">SWEETGUM, SWAMP
RED MAPLE, ALDER</td><td colspan="2">GREEN ASH,WHITE ELM
taller willows</td></tr>
</table>

Percentage of evergreens in total woody basal area

GRADIENT IN DRYNESS AND DISTURBANCE	pH-RELATED GRADIENT (A: strongly acid to E: circumneuntral)				
	A	B	C	D	E
9 openings	66	no plots	no plots	no plots	63
8 xeric-sx.+	51	56	61	no plots	29
7 subxeric+	7.9	9.4	8.5	12	27
6 sx.-mesic	34	17	14	3.3	4.4
5 submesic+	50	37	4.2	0.4	2.3
4 mesic coll.	65	36	8.6	0	0
3 mesic all.	no plots	41	3.1	0	0
2 riparian	no plots	(1 plot)	0.2	0.1	0
1 subhydric	no plots	33	3.3	0.5	0

Frequency of *Bignonia capreolata* (crossvine)

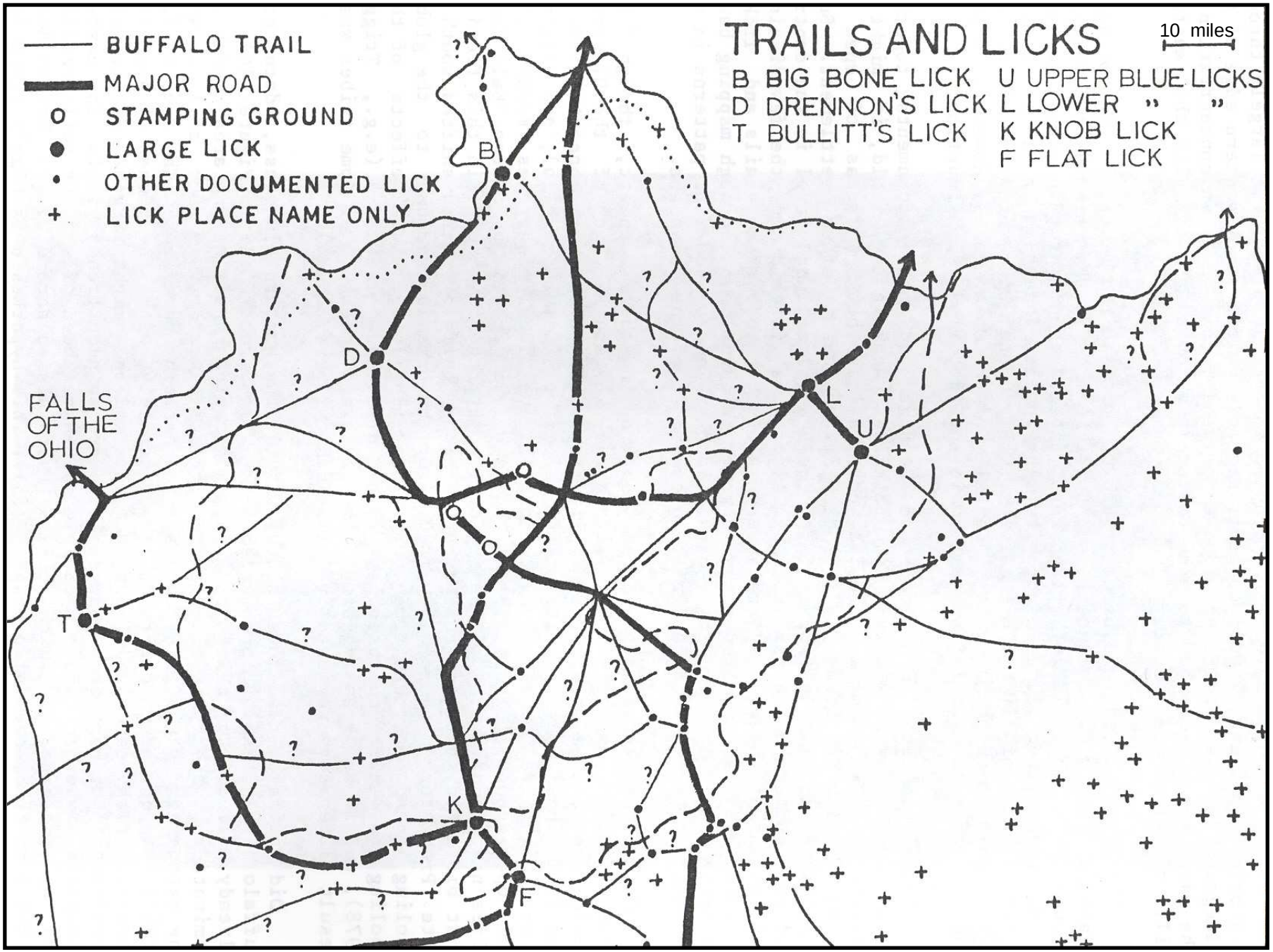
GRADIENT IN DRYNESS AND DISTURBANCE	pH-RELATED GRADIENT (A: strongly acid to E: circumneuntral)				
	A	B	C	D	E
9 openings	(0/19)				(0/2)
8 xeric-sx.+	(0/22)	(0/25)	(0/16)	(0/0) + #13	(2/9)
7 subxeric+	(0/43)	(1/72) + #1	(1/27) + #17	(0/5) + #5,15,16	(2/10) +
6 sx.-mesic	(0/12)	(0/47)	(5/56)	(2/45) #9?	(7/41)
5 submesic+	(0/7)	(0/19) +	(2/24) +	(3/25) + #2,7,8,10,11	(3/26) + #4
4 mesic coll.	(0/11)	(1/14)	(2/22) +	(1/26)	(0/8)
3 mesic all.		(0/8)	(2/13) #6	(0/3) #3	(0/2)
2 riparian		(0/1)	(1/9)	(0/9) #12	(0/4)
1 subhydric		(0/7)	(7/48)	(4/4) #14	(0/5)

Frequency of *Smilax glauca* (catbriar)

GRADIENT IN DRYNESS AND DISTURBANCE	pH-RELATED GRADIENT (A: strongly acid to E: circumneuntral)				
	A	B	C	D	E
9 openings	(6/19)				(0/2)
8 xeric-sx.+	(17/22) + #3,9	(18/25) + #4,8	(10/16) +		(0/9)
7 subxeric+	(28/43) ++ #5,6	(47/72) ++ #7	(20/27) +	(0/5)	(0/10)
6 sx.-mesic	(5/12) +	(24/47) +	(25/56) +	(12/45)	(0/41)
5 submesic+	(2/7) +	(6/19) +	(9/24) +	(7/25)	(1/26)
4 mesic coll.	(1/11)	(3/14) +	(2/22) +	(0/25)	(0/8)
3 mesic all.		(2/8)	(2/13)	(0/3)	(0/2)
2 riparian		(0/1)	(2/9)	(0/9)	(0/4)
1 subhydric		(3/7)	(14/48)	(1/4)	(0/5)

Potential for evergreen vines to be eaten; applications in land management, restoration

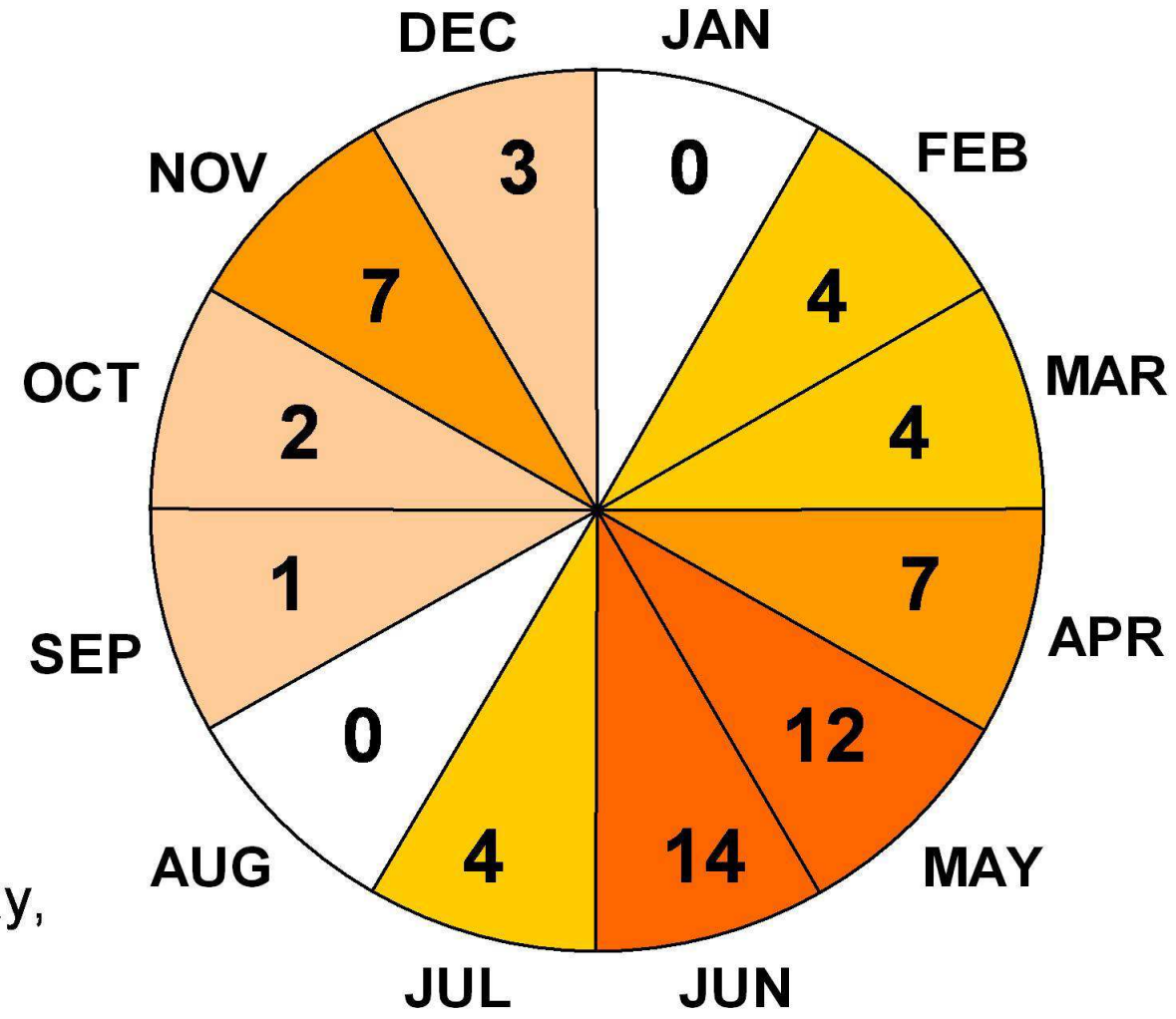
Note also in eutrophic woods: trees with thorns, toxins, big fruits (e.g. honey-locust, coffee-tree); and buffalo-clovers; ecological patterns at Griffith Woods etc.


TRAILS AND LICKS
10 miles
BUFFALO TRAIL
MAJOR ROAD
STAMPING GROUND
LARGE LICK
OTHER DOCUMENTED LICK
LICK PLACE NAME ONLY
B BIG BONE LICK
D DRENNON'S LICK
T BULLITT'S LICK
U UPPER BLUE LICKS
L LOWER " "
K KNOB LICK
F FLAT LICK
FALLS OF THE OHIO
B
D
L
U
T
K
F

Monthly numbers of recorded buffalo sightings in the central Ohio Valley during 1750-86, as reported in all available accounts.

Darker red indicates clustering of records.

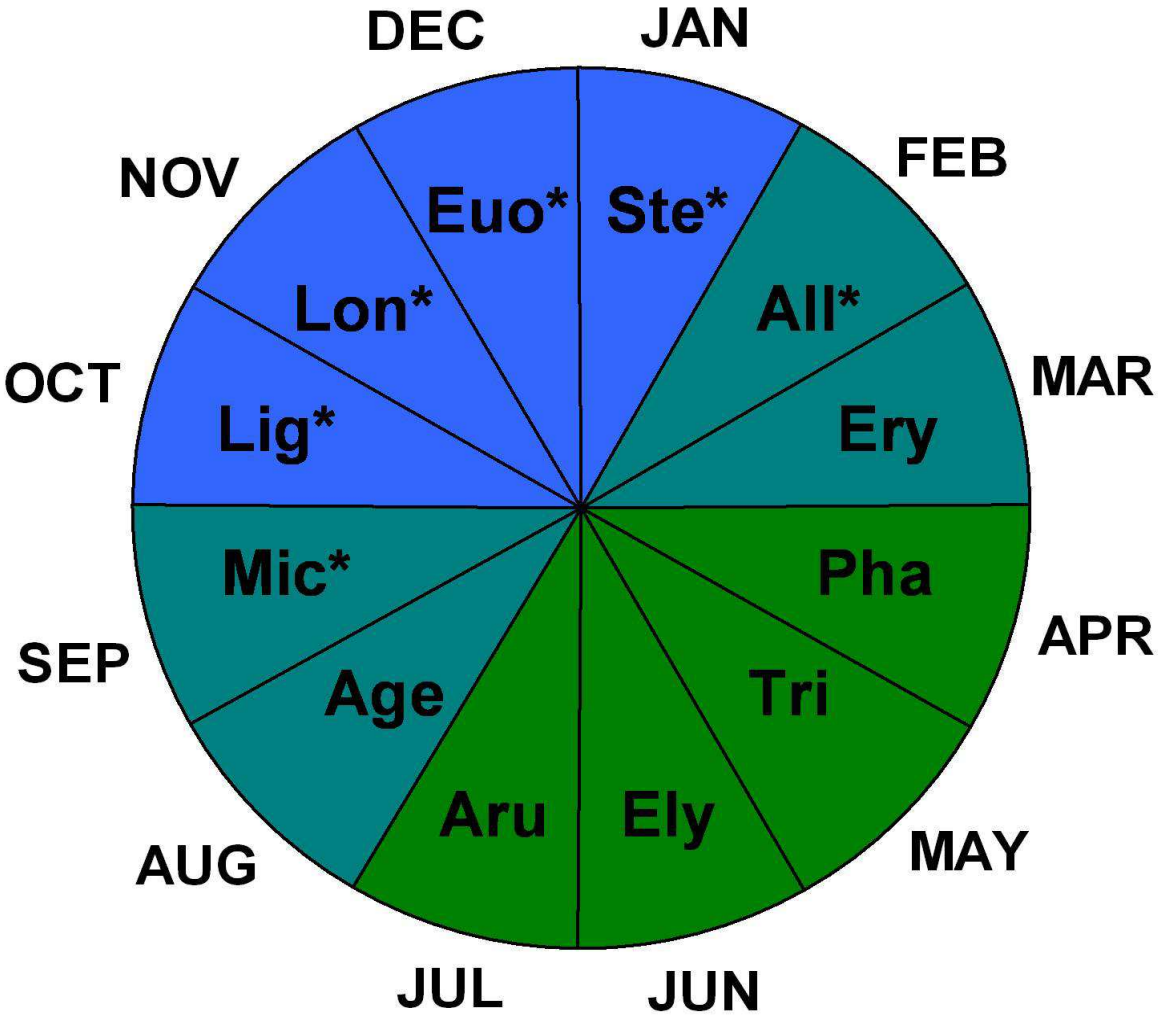
The largest herds were reported during Apr-May, with 100-1000+.

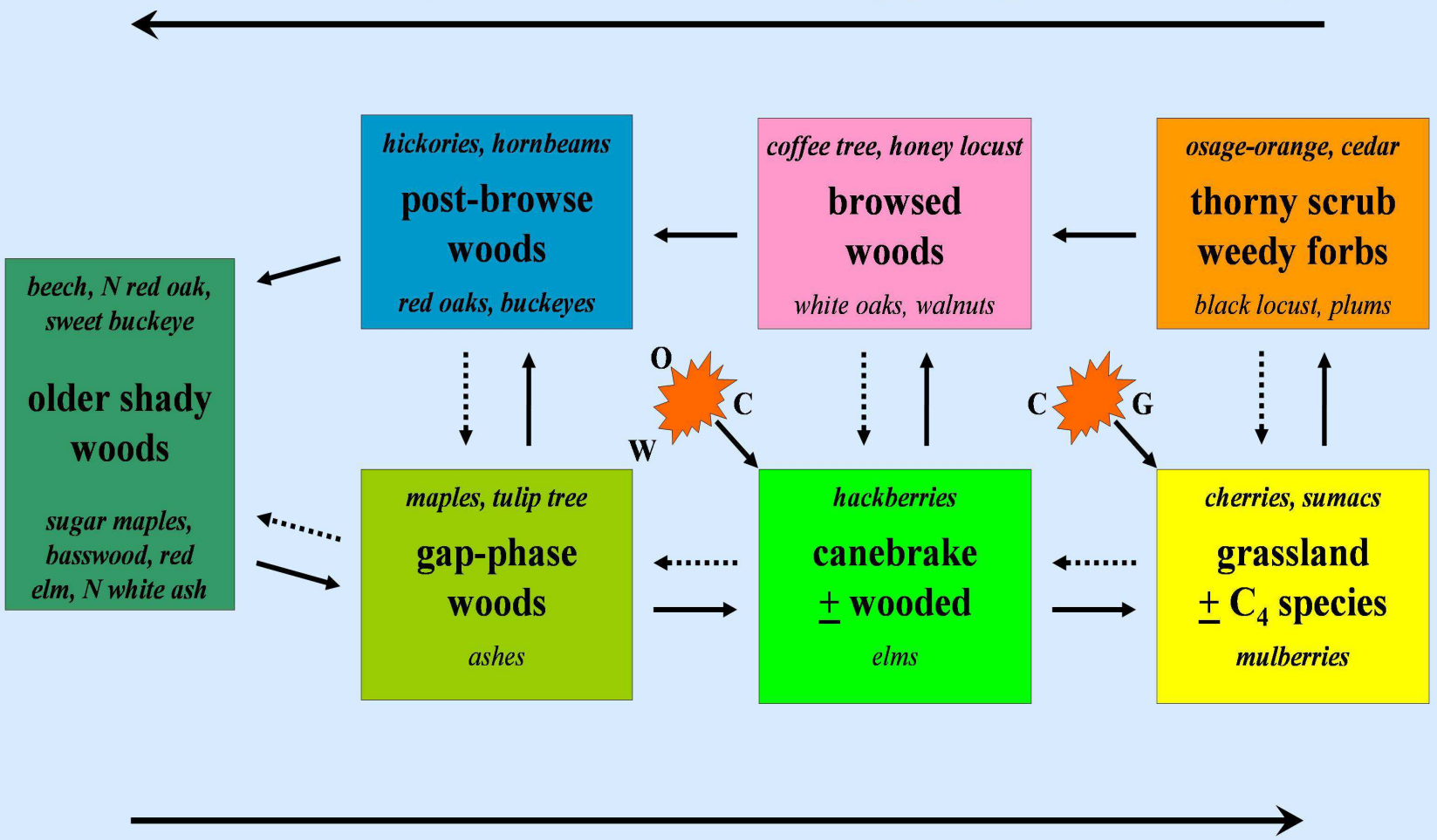


Green: season with most new growth of native forage plants in Bluegrass Woodland.

Blue: season with most exposure of alien plants* relative to native plants.

Cane (Aru) was the only abundant native forage persisting into Oct-Jan.





Letters indicate fuel for fires: W = woody debris; O = oak litter; C = old cane; G = old grass.

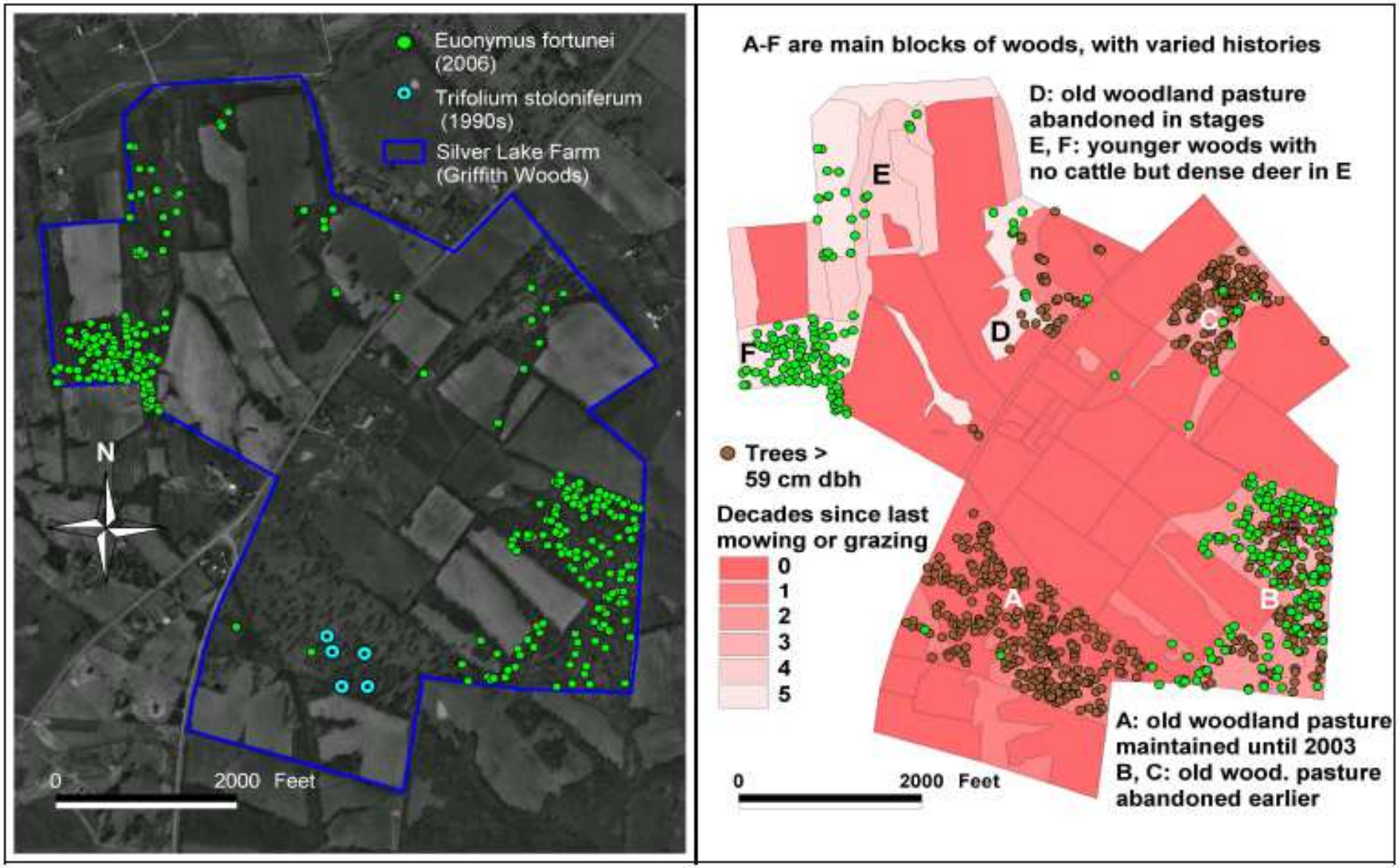
DIAGRAM OF ECOLOGICAL CONCEPT FOR DYNAMIC VARIATION IN WOODLAND OF THE CENTRAL BLUEGRASS (ASSUMING UNIFORM EUTROPHIC SOIL)

American Mastodon, a species of spruce woodlands and cool temperate lowlands that fed a lot on woody plants (including bark and fruit), rather than mostly grass as in the mammoths. Once common in the Bluegrass region, it survived on Earth until 4000-5000 years ago. [Painting by Charles R. Knight]

Some suggestions for Griffith Woods (with plantings)
and other sites in Bluegrass:
plenty of room for varied trials!

e.g. also at BGAD, Taylor Fork, Julian Savanna, UK Arboretum, perhaps even Palisades in general and most sites on damp fertile soils

"The beautiful estate of Spring Hill, originally consisting of upward of 3,000 acres, comprised a military grant to Captain Nathaniel Hale."



We need to establish long-term research for comparing effects of browsing, burning & mowing on woods/plantings

1. Communication: continued open exchange of data, ideas, discussion of proposals (developing shared goals)

2. Partnerships: truly cooperative research, management, education, funding (focus on regional, local goals)

3. Evaluation: mutual assessment of success or failure (based on goals); including efforts to reduce alien plants

Appendix: Kentucky has a lot to offer but...
120 counties, watershed divisions, aquatic/terrestrial divorce; multiple interest groups in conservation/environment but little/no coordination among these groups for effective action

1. Cultural issues in cooperative development:
agendas of institutions versus communities
(as in republican versus democrat—see national level...)

2. Potential role for something like ecoregional planning (see TNC's effort ca 1995-2005); why does such work not become continued, solidified, deepened within regions?

3. Simple need for regular regional conferences where each institution--or significant private land-owner--is able to briefly present, and where common goals can be developed...
KDFWR, KWS, KNC, KSNPC, KNPS, KDF, academics, etc.