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A Survey of the Flora of the Chris Hale Property, Kendall County, Texas, 5 May 2004

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Introduction

On 5 May 2004, I conducted a botanical survey of the Chris Hale property in the Blanco River watershed near Lindendale in northeastern Kendall County, Texas. The survey was undertaken at the request of Steve Jester, the Conservancy's Blanco River Project Director, and at the invitation of Mr. Hale. After giving me the ten-dollar tour of the ranch, Mr. Hale turned me loose to conduct solo field work for about five hours. During that time, about 184 plant species were encountered, including four species that are of low to moderate conservation interest.

Setting

The Hale property occupies about 667 acres just southwest of Lindendale in northeastern Kendall County, roughly 11 to 12 miles west of the town of Blanco. Access is via a gate on the south side of R. M. 1888 about eight miles west of its junction with R. M. 1623. The ranch includes a roughly mile-long stretch of the Blanco River as well as terraces or valley flats along both banks. It also extends some distance onto the limestone ridge south of the river, the divide that separates the Blanco River watershed from that of the Guadalupe River. Although precise boundaries of the property are unknown to me, it appears to lie entirely on the Whitworth Ranch Quadrangle (USGS, 1963). Elevation ranges from about 1620 feet along the river to about 1910 feet on the ridgetop to the south.

According to the Llano sheet of the Geological Atlas of Texas (Barnes & Rose, 1981), two Cretaceous limestone formations are present on the property. Higher points on the southern ridge are underlain by the Fort Terrett member of the Edwards Limestone; exposures are conspicuous in a few places. Lower slopes are underlain by the Upper Glen Rose Formation. Terraces and valley flats along the Blanco River are mantled by Recent alluvium.

Soils of the property are mapped on sheet 3 of the county soil survey (Dittemore & Hensell, 1981). Eight mapping units representing seven range sites are present (Table 1). Most are well drained, calcareous, moderately alkaline clays and clay loams that vary in depth depending on topographic position. However, Anhalt clay, a soil assigned to the Deep Redland range site, is also present. Its surface layer is neutral and its upper subsoil is slightly acid. Such soils typically support a herbaceous flora that differs somewhat from that of alkaline soils, but time did not allow an investigation of that situation on the Hale property.

Areas Examined

Seven areas were examined in some detail (Figure 1). These areas were selected because of their likelihood of supporting populations of plant species of interest and their relative ease of access (i.e., proximity to roads). After the discovery of a particularly interesting species in a ridgetop woodland, most of the rest of the day was spent examining similar habitat elsewhere on the ranch. As a result, some major habitat types, most notably riparian woodlands and Redland sites, were visited only very briefly, and their florula is poorly represented on the plant list.

Plant Species of Interest

For the purposes of conservation planning, The Nature Conservancy collects information on about 400 of the rarest plant species of Texas. All of these species are rare from the global perspective; i.e., they are not just rare in Texas, they are rare throughout their ranges. All are thought to occur in 100 or fewer populations worldwide.

Four such species were found on the Hale property during this survey (Table 2). Three of the species, spreading least-daisy (*Chaetopappa effusa*), Texas fescue (*Festuca versuta*), and Heller's marbleseed (*Onosmodium helleri*), are on the common end of the rare plant spectrum. The fourth, Hill Country wild-mercury (*Argythamnia aphoroides*), is known from only about 25 populations. None has any status with the U. S. Fish and Wildlife Service as an Endangered or Threatened species. The local populations of each species are discussed below. Digital images of all four species were captured and are provided separately.

Spreading least-daisy is a summer-blooming perennial wildflower that is endemic to the Edwards Plateau of Texas; it occurs nowhere else in the world. It is locally common in wooded canyonlands of the Southern Edwards Plateau (Bandera, Bexar, Edwards, Kerr, Medina, Real and Uvalde counties) but quite rare to the north and east (Blanco, Comal, Gillespie, Hays and Kendall counties). It has turned up in only a few spots in the Blanco River watershed. During this survey, spreading least-daisy was observed in "Sinkhole Canyon," a particularly mesic, steep-sided stretch of the canyon of the main drainage south of the river, under and up to about 500 feet south of the LCRA power line. This spot lies near the contact of the Edwards and Glen Rose formations, and a line of seeps is present. The canyon is shaded by a deciduous woodland or forest containing Texas oak (*Quercus buckleyi*), Arizona walnut (*Juglans major*), cedar elm (*Ulmus crassifolia*), escarpment black cherry (*Prunus serotina* ssp. *eximia*), and a few Ashe juniper (*Juniperus ashei*); eastern sycamore (*Platanus occidentalis*) is present in the creekbed itself. Somewhere between 200 and 300 individuals were observed in this area, mostly on well drained gravelly clay of the canyon slopes but also on rock outcrops along the rim. Noteworthy herbaceous associates included maidenhair fern (*Adiantum capillus-veneris*), Texas fescue, white avens (*Geum canadense*), Heller's marbleseed, streamside phlox (*Phlox pilosa* ssp. *riparia*), golden ragwort (*Senecio obovatus*), and plateau spiderwort (*Tradescantia edwardsiana*).

Texas fescue is a spring-blooming perennial bunchgrass with a range that includes small portions of Arkansas, Oklahoma and Texas. (According to NatureServe, an organization that collects and shares biodiversity data, the range of the species also includes Kansas, Nebraska and Tennessee; if this proves to be true, Texas fescue will probably cease to be a species of conservation interest.) In Texas, it is known from nine counties along the Balcones Escarpment. It is largely restricted to forests and woodlands on mesic limestone slopes and canyon bottoms, where it presumably serves some role in soil conservation. On the Hale Ranch, this grass was found in some abundance at the Sinkhole Canyon site described above. Several hundred plants were present, most of them in flower at the time.

Heller's marbleseed is another Texas endemic; its global range is limited to Bandera, Bexar, Comal, Hays, Kendall, Kerr, Travis, and Uvalde counties. This spring-blooming perennial is common in canyon woodlands in Travis County but seems to be rather scarce elsewhere. For some reason, it's not scarce on the Hale Ranch: it was detected in four spots (see Figure 1), including mesic spots like Sinkhole Canyon and drier, more open sites such as the wild-mercury sites described below. The census totaled about 100 individuals, but many more should be expected in unexamined areas of similar habitat.

Hill Country wild-mercury was the big surprise of the day. This odd herbaceous perennial is known from about 25 populations (current and historic) in Bandera, Bexar, Blanco, Brown, Comal, Gillespie, Hays, Kendall, Kerr, Kimble, Menard, Mills, Tom Green and Uvalde counties. Very little is known about its ecology; even its "preferred" habitat is open to debate. It has been found in both woodlands and grasslands on limestone uplands, but which type is the optimal situation is unclear at this point. The discovery of a new population on the Hale Ranch may shed some light on the situation. Tow clusters were observed, one at

area 5 (at N30°06'07.7", W098°38'19.1" and vicinity) and the other at area 6 (at N30°05'58.4", W098°38'33.0" and vicinity); see Figure 1. In both spots, Hill Country wild-mercury occurred on shallow stony clay soils on a very gentle slope and flat bench of Edwards Limestone just below the top of the landscape, in partial shade of an open woodland with Arizona walnut clearly dominating a canopy of about 25 percent cover at 25 to 30 feet and shinnery thickets of scalybark oak (*Quercus sinuata* var. *breviloba*) providing about 25 percent cover at 3 to 6 feet. The openness of the woodland allowed the development of a dense grassy ground layer dominated by little bluestem (*Schizachyrium scoparium*). Ashe juniper was notably scarce. Other associates included toothache tree (*Zanthoxylum hirsutum*), Virginia creeper (*Parthenocissus quinquefolia*), Texas redbud (*Cercis canadensis* var. *texensis*), elbowbush (*Forestiera pubescens*), and Heller's marbleseed. Eighteen individuals were observed at area 5 and four at area 6. Most plants were remarkably robust, with dozens of stems and numerous flowers. Ten plants bore only male flowers, nine bore only female flowers, and three were hermaphroditic. Some flowers were being visited by a hymenopteran resembling the Eurasian honeybee (*Apis mellifera*).

Significance

This survey of the flora of the Hale Ranch was by no means complete, but it did reveal the presence of several interesting plant species. The ranch's populations of Texas fescue and spreading least-daisy may be only of regional interest, but its populations of Heller's marbleseed and Hill Country wild-mercury, both Edwards Plateau endemics, are of global significance.

Due to the happy coincidence of its occurrence within habitat of the golden-cheeked warbler (*Dendroica chrysoparia*), Heller's marbleseed is protected at numerous sites in Travis County. But outside of the Austin area, only a few populations are known, none of them from conservation areas. Based on the numbers reported here, the Hale Ranch population may appear small. However, hundreds of acres of suitable habitat were not examined during this visit, and some of those acres doubtless support additional clusters of marbleseed. It should also be noted that marbleseed occurs on an adjacent property (also surveyed during this project); the two reported small populations are probably one large viable population, one more worthy of conservation efforts.

Hill Country wild-mercury isn't "in conservation" anywhere at present, and no range-wide assessment of its status has been undertaken since the work of Dr. Bill Mahler more than twenty years ago (Mahler, 1981). It remains a mystery species, despite the fact that it is large and quite conspicuous for most of the growing season. As is the case with Heller's marbleseed, the Hale Ranch population may seem small as reported here, but additional field work would no doubt reveal additional clusters, and the population is known to extend onto an adjacent ranch. It certainly appears to be among the larger populations currently known, and therefore the Blanco River headwater area may be a good place to undertake voluntary conservation of Hill County wild-mercury. Precisely what measures might be involved are unknown, if only because so little is known about the ecology of the species. On the Hale Ranch it seems to flourish in upland woodlands that are open enough to allow a dense ground layer of midgrasses, which suggests that measures that favor that sort of vegetational structure might also benefit this rare species. The area might be monitored every few years to check for encroachment of woody species, particularly Ashe juniper. However, Ashe juniper is curiously rare on this divide, on both the Blanco and Guadalupe sides, and its management is less of an issue here than in other areas.

Literature Cited

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Mahler, W. F. 1981. Status report [on *Argythamnia aphoroides*]. Report prepared for U. S. Fish & Wildlife Service, Albuquerque.

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Table 1. Soils of the Chris Hale property, Kendall County, Texas, as mapped in the soil survey of Kendall County (Dittemore & Hensell, 1981).

Symbol	Mapping Unit	Classification	Range Site
1	Anhalt clay	Udic Chromusterts	Deep Redland
5	Brackett-Real association, hilly	Typic Ustochrepts (Brackett) and Typic Calciustolls (Real)	Steep Adobe
8	Doss silty clay, 1-5% slopes	Typic Calciustolls	Shallow
10	Eckrant-Comfort association, gently undulating	Lithic Haplustolls (Eckrant) and Lithic Argiustolls (Comfort)	Low Stony Hill
11	Eckrant-Comfort association, steep	Lithic Haplustolls (Eckrant) and Lithic Argiustolls (Comfort)	Steep Rocky
12	Krum silty clay, 1-3% slopes	Vertic Haplustolls	Clay Loam
15	Nuvalde silty clay, 1-3% slopes	Typic Calciustolls	Clay Loam
16	Oakalla silty clay loam	Cumulic Haplustolls	Loamy Bottomland

Table 2. Plant species of interest observed on the Chris Hale property, Kendall County, Texas, 5 May 2004.

Plant Species	Global Rank
spreading least-daisy (*Chaetopappa effusa*)	G3 or G4
Texas fescue (*Festuca versuta*)	G3 or G4
Heller's marbleseed (*Onosmodium helleri*)	G3
Hill Country wild-mercury (*Argythamnia aphoroides*)	G2

Explanation of Global Ranks

G1 = less than 6 occurrences known globally; critically imperiled, especially vulnerable to extinction
G2 = 6-20 occurrences known globally; imperiled and very vulnerable to extinction throughout its range
G3 = 21-100 occurrences known globally; either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single state or physiographic region), or because of other factors making it vulnerable to extinction throughout its range
G4 = more than 100 occurrences known; apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery
G5 = demonstrably secure globally, though it may be quite rare in parts of its range

Figure 1. Areas surveyed, Chris Hale property, Kendall County, Texas, 5 May 2004. Base map: Whitworth Ranch Quadrangle (USGS, 1963). Hill Country wild-mercury (*Argythamnia aphoroides*) was observed in areas 5 and 6; spreading least-daisy (*Chaetopappa effusa*) in area 2; Texas fescue (*Festuca versuta*) in area 2; and Heller's marbleseed (*Onosmodium helleri*) in areas 2, 3, 6 and 7.

Table 3. Plant species observed on the Chris Hale property, Kendall County, Texas, 5 May 2004. Species endemic to (found only on) the Edwards Plateau are marked with a plus (+) sign. Exotic species, those not native to North America, are flagged with a negative (-) sign.

Trees, Shrubs and Woody Vines

red buckeye	Aesculus pavia var. flavescens
Roosevelt-weed	Baccharis neglecta
agarito	Berberis trifoliolata
sugar hackberry	Celtis laevigata
netleaf hackberry	Celtis reticulata
Texas redbud	Cercis canadensis var. texensis
roughleaf dogwood	Cornus drummondii
Tracy hawthorn	Crataegus tracyi
Texas persimmon	Diospyros texana
white lace cactus	Echinocereus reichenbachii var. reichenbachii
Texas kidneywood	Eysenhardtia texana
elbowbush	Forestiera pubescens
Texas ash	Fraxinus texensis
Lindheimer silk-tassel	Garrya ovata var. lindheimeri (G. lindheimeri)
deciduous holly	Ilex decidua
yaupon	Ilex vomitoria
Arizona black walnut	Juglans major
Ashe juniper	Juniperus ashei
white bush-honeysuckle	Lonicera albiflora
fragrant mimosa	Mimosa borealis
red mulberry	Morus rubra
Texas nolina, Devil's shoestring	Nolina texana
Lindheimer's pricklypear	Opuntia lindheimeri
+sevenleaf creeper	Parthenocissus heptaphylla
Virginia creeper	Parthenocissus quinquefolia
eastern sycamore	Platanus occidentalis
escarpment black cherry	Prunus serotina ssp. eximia
wafer ash	Ptelea trifoliata
Texas oak	Quercus buckleyi
plateau live oak	Quercus fusiformis
Lacey oak	Quercus laceyi
shin oak	Quercus sinuata var. breviloba
post oak	Quercus stellata
Carolina buckthorn	Rhamnus caroliniana
poison ivy, poison oak	Rhus toxicodendron ssp. eximia
southern dewberry	Rubus trivialis
dewberry	Rubus sp.
western soapberry	Sapindus saponaria var. drummondii
gum bumelia	Sideroxylon lanuginosum (Bumelia lanuginosa)
greenbriar	Smilax bona-nox
cedar elm	Ulmus crassifolia
Mexican buckeye	Ungnadia speciosa
rusty blackhaw	Viburnum rufidulum
-chaste-bush	Vitex agnus-castus
Spanish grape	Vitis berlandieri

+mountain grape	Vitis monticola
narrowleaf yucca	Yucca sp. (Y. constricta?)
+twistleaf yucca	Yucca rupicola
toothache tree, tickle-tongue	Zanthoxylum hirsutum

Forbs (Wildflowers and Weeds)

Fraser wild-onion	Allium canadense var. fraseri
Drummond wild-garlic	Allium drummondii
Bentham sandwort	Arenaria benthamii
+Hill Country wild-mercury	Argythamnia aphoroides (Ditaxis aphoroides)
+tall wild-mercury	Argythamnia simulans (Ditaxis simulans)
antelope-horn milkweed	Asclepias asperula
Texas milkweed	Asclepias texana
greenflower milkweed	Asclepias viridiflora
American bifora	Bifora americana
Brazos-mint	Brazoria scutellarioides
brickell-bush	Brickellia cylindracea
standing winecup, poppy mallow	Callirhoe leiocarpa
-nodding thistle	Carduus nutans
-slender bristle-thistle	Carduus tenuiflorus
annual paintbrush	Castilleja indivisa
-yellow star-thistle	Centaurea melitensis
chervil	Chaerophyllum tainturieri
+tall least-daisy	Chaetopappa effusa
gray golden-aster	Chrysopsis canescens (Heterotheca canescens)
Texas thistle	Cirsium texanum
Carolina snailseed	Cocculus carolinus
rain-lily	Cooperia sp.
larkspur	Delphinium sp.
tall tickseed	Desmodium paniculatum
Engelmann daisy	Engelmannia pinnatifida
prairie fleabane	Erigeron modestus
fleabane	Erigeron sp. (E. strigosus?)
-crane's-bill	Erodium cicutarium
late boneset	Eupatorium serotinum
+blackfoot spurge	Euphorbia angusta (Chamaesyce angusta)
wild poinsettia	Euphorbia cyathophora (Poinsettia cyathophora)
warty spurge	Euphorbia spathulata (Tithymalus spathulatus)
flathead rabbit-tobacco	Evax prolifera
roundhead rabbit-tobacco	Evax verna (E. multicaulis)
firewheel, Indian blanket	Gaillardia pulchella
clingon bedstraw	Galium aparine
wand bedstraw	Galium virgatum
shortfruit gaura	Gaura brachycarpa
gaura	Gaura sp.
white avens	Geum canadense
false pennyroyal	Hedeoma acinoides
old plainsman	Hymenopappus scabiosaeus var. corymbosus

slenderleaf bitterweed

stemless bitterweed
wild lettuce
hairy pepperweed
Texas bush-clover
+plateau bladderpod
annual flax
rock flax
fringed puccoon
-common horehound
+plateau milkvine
least burclover
sensitive-briar
crow-poison
stemless evening-primrose
+Heller's marbleseed
yellow sour-clover
cucumberweed
Lindheimer nailwort
yellow passionflower
knotweed leaf-flower
streamside phlox
ground-cherry
rock lettuce
Heller's plantain
redseed plantain
white milkwort
Illinois pondweed
false-dandelion
mexican hats
Texas snoutbean
low wild-petunia
Texas sage
annual skullcap
eggleaf skullcap
yellow stonecrop
golden groundsel
twoleaf senna
creeping yellow sida
blue-eyed grass
silverleaf nightshade
woodland goldenrod
-sow-thistle
smooth scaleseed
Texas queen's-delight
slender greenthread
Navajo tea
ballmoss
-tall sockbane
-lesser sockbane

Hymenoxys linearifolia (Tetraneuris linearifolia)
Hymenoxys scaposa (Tetraneuris scaposa)
Lactuca sp.
Lepidium austrinum
Lespedeza texana
Lesquerella recurvata
Linum rigidum
Linum rupestre
Lithospermum incisum
Marrubium vulgare
Matelea edwardsensis
Medicago minima
Mimosa sp. (Schrankia sp.)
Nothoscordum bivalve
Oenothera triloba
Onosmodium helleri
Oxalis dillenii
Parietaria pensylvanica (P. obtusa)
Paronychia lindheimeri
Passiflora affinis
Phyllanthus polygonoides
Phlox pilosa
Physalis sp.
Pinaropappus roseus
Plantago helleri
Plantago rhodosperma
Polygala alba
Potamogeton illinoensis
Pyrrhopappus pauciflorus (P. multicaulis)
Ratibida columnifera
Rhynchosia senna var. texana (R. texana)
Ruellia humilis
Salvia texana
Scutellaria drummondii
Scutellaria ovata
Sedum nuttallianum
Senecio obovatus
Senna roemeriana (Cassia roemeriana)
Sida abutifolia (S. filicaulis)
Sisyrinchium scabrum (S. ensigerum)
Solanum elaeagnifolium
Solidago sp.
Sonchus sp.
Spermolepis inermis
Stillingia texana
Thelesperma filifolium
Thelesperma simplicifolium
Tillandsia recurvata
Torilis arvensis
Torilis nodosa

+plateau spiderwort, snotweed	Tradescantia edwardsiana
common noseburn	Tragia ramosa
Venus' looking-glass	Triodanis perfoliata
corn-salad	Valerianella amarella
corn-salad	Valerianella radiata
-rabbit-ear mullein	Verbascum thapsus
Dakota vervain	Verbena bipinnatifida (Glandularia bipinnatifida)
gray vervain	Verbena canescens
+Lindheimer's crownbeard	Verbesina lindheimeri
frostweed, iceplant	Verbesina virginica
Leavenworth vetch	Vicia ludoviciana var. leavenworthii
hairy zexmenia	Wedelia texana (Zexmenia hispida)

Grasses and Grasslike Plants

bushy bluestem	Andropogon glomeratus
purple threeawn	Aristida purpurea (two vars.)
-King Ranch bluestem	Bothriochloa ischaemum var. songarica
-rescuegrass	Bromus catharticus (B. unioloides)
-Japanese brome	Bromus japonicus
cedar sedge	Carex planostachys
-catapodium	Catapodium rigidum
-Bermudagrass	Cynodon dactylon
Lindheimer's panicgrass	Dichanthelium lindheimeri (Panicum lindheimeri)
Scribner's panicgrass	Dichanthelium oligosanthes (Panicum oligosanthes)
splitscale spikesedge	Eleocharis acutisquamata
perennial spikesedge	Eleocharis montividensis
hairy tridens	Erioneuron pilosum
Texas fescue	Festuca versuta
wild barley	Hordeum pusillum
rush	Juncus interior
Ozarkgrass	Limnodea arkansana
+hybrid muhly	Muhlenbergia involuta
Lindheimer's muhly	Muhlenbergia lindheimeri
seep muhly	Muhlenbergia reverchonii
aparejograss	Muhlenbergia utilis
speargrass, Texas wintergrass	Nassella leucotricha (Stipa leucotricha)
-Kleingrass	Panicum coloratum
switchgrass	Panicum virgatum
-annual bluegrass	Poa annua
little bluestem	Schizachyrium scoparium
yellow Indiangrass	Sorghastrum nutans
-Johnsongrass	Sorghum halepense

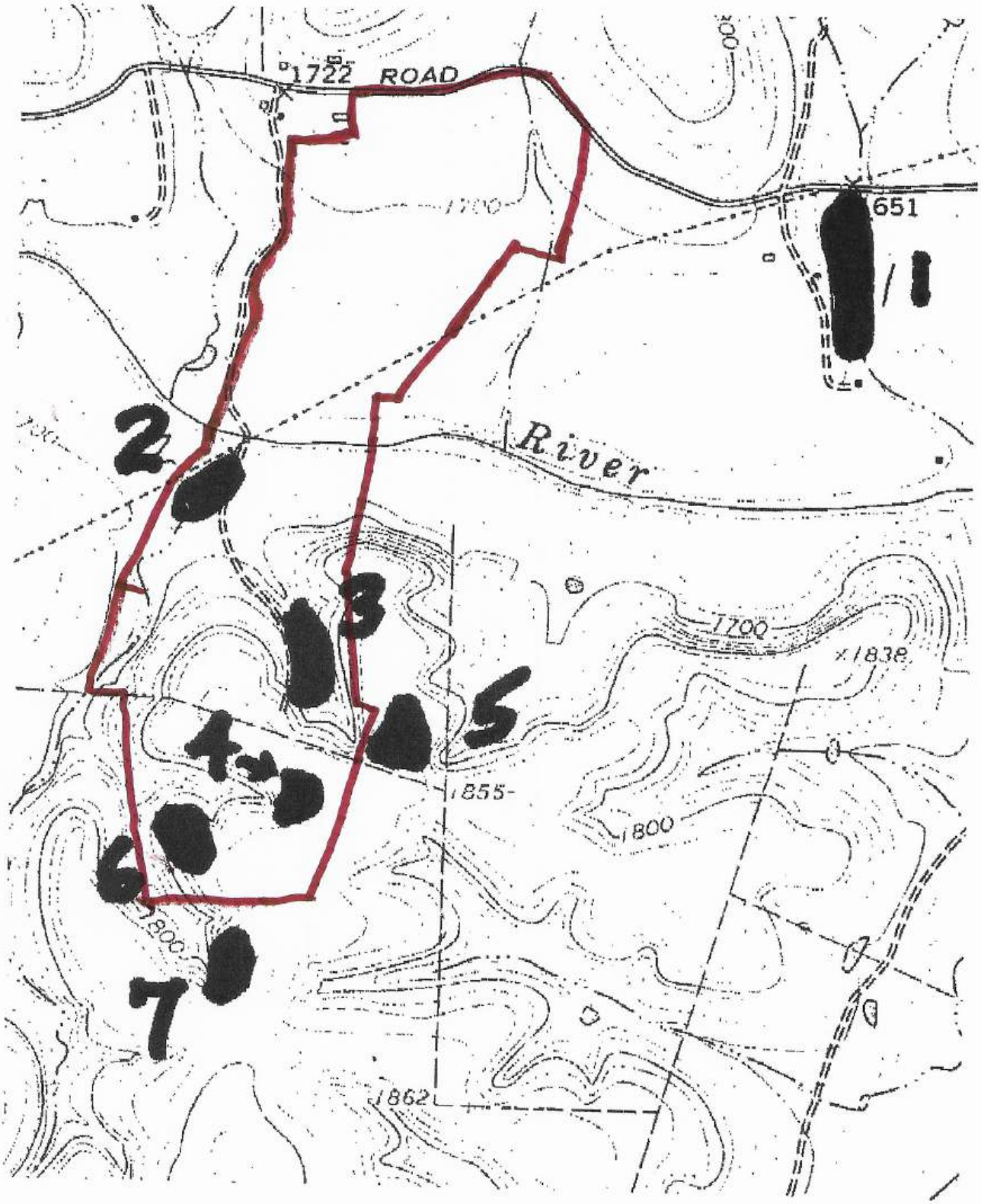
Ferns

maidenhair fern	Adiantum capillus-veneris
purple cliff-brake	Pellaea atropurpurea

river fern, Lindheimer shield-fern | Thelypteris ovata var. lindheimeri

Summary

Trees, shrubs and woody vines	49 species
Forbs	104 species
Grasses and grass-like plants	28 species
Ferns	3 species
Total	184 species, including 13 endemics (7% of total) and 18 exotics (10% of total)



Bill Cox site map