2000-D

SURVEY OF *VALERIANELLA NUTTALLII*, NUTTALL'S CORNSALAD, IN OKLAHOMA

SUBMITTED BY

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SUBMITTED TO

U. S. Fish and Wildlife Service

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I. Species Information

1. Classification and nomenclature.

A. Species or infraspecific taxon

i. Scientific name

a. Accepted binomial

Valerianella nuttallii (Torrey & Gray) Walp.

b. Full bibliographic citation for all binomials including synonyms:

First valid description:

Valerianella nuttallii (Torrey & Gray) Walp. *in* Repertorii botanica systematicae 2: 527. 1843

Fedia nuttallii Torrey and Gray. Flora North America 51. 1841.

Siphonella nuttallii (Torrey & Gray) Small, Flora of the southeast United States. 1129. 1903.

Type specimens:

V. nuttallii f. *nuttallii*:

Nuttall *s. n.* (holotype: NY). Arkansas, "On the plains of Arkansas". Without a specific location.

V. nuttallii f. *compacta*:

D. M. Eggers-Ware & D. Demaree, 2066 (holotype: US; isotypes: ALU, AP, FSU, GH, KANU, KSC, KY, MICH, MO, LL, NCSC, NY, OKL, OKLA, OS, SIU, SMS, SMU, TAES, TEX, TTC, UARK, UMO, US, VDB, WM, WVA). Arkansas, Hot Spring Co.: in sandy soil along roadside ditch, on Arkansas Highway 7, about 2.2 miles southeast of the Garland-Hot Spring county line.

ii. Pertinent synonyms

Valerianella nuttallii (Torrey & Garay) Walp. forma *nuttallii* Walp. *in* Repertorii botanices systematicae 2: 527. 1843.

Valerianella nuttallii (Torrey & Garay) Walp. forma *compacta* Eggers-Ware, *in* Systematic Biology 8: 42. 1983.

iii. Common name: Nuttall's cornsalad.

B. Family name:

Valerianaceae

C. History of knowledge of the taxon:

Valerianella nuttallii was originally described as a new species by John Torrey and Asa Gray in 1841. The original specimen came from an unspecified locality in Arkansas, and the species was originally assigned to the genus *Fedia* J. Gaertner. *Fedia* was first proposed as a genus by Adanson in 1763, but this usage has been rejected in favor of the one proposed by Gaetner in 1790. Gaetner, typified *Fedia* on the basis of *F. cornucopiae* (L.) J. Gaetner, a species known from the Mediterranean region of Europe, and the genus is now considered to be restricted to Europe.

The genus *Siphonella* Small was originally proposed in 1903. No type species has ever been designated for the genus and it is now considered synonymous with *Fedia* J. Gaetner.

The taxonomic status of *V. nuttallii* as a distinct species is not considered doubtful. This taxon has been maintained at the specific rank in all of the regional floristic treatments (Small, 1903; Waterfall, 1969), checklists (Taylor and Taylor, 1989, 1991, 1994), atlases (Smith, 1978), and in monographic treatments of the genus (Gray, 1883; Eggers, 1969; Eggers-Ware, 1983).

Currently two forms are recognized within *V. nuttallii* on the basis of differences in the form of the mature fruits. All *Valerianella* have a three-locular ovary, with a single ovule in only one of the locules. In some instances, the two infertile locules are manifestly inflated in the mature fruit and much larger in cross section than the fertile locule. As a result, the mature fruit is noticeably asymmetrical in cross section, and distinctly keeled longitudinally (*V. nuttallii* f. *nuttallii sensu* Eggers-Ware). In the alternate condition, the two infertile locules are not manifestly inflated and they are similar in size and appearance to the fertile locule. This results in a mature fruit that is distinctly 3-angled, more or less symmetrical in cross section, without a distinct longitudinal keel (*V. nuttallii* f. *compacta* Eggers-Ware). Eggers-Ware first noted this distinction in her monograph of the genus in 1969, and formally described two forms in 1983.

D. Current alternative taxonomic treatment:

Experimental evidence (Eggers-Ware, 1983) indicates that the difference in fruit morphology in *V. nuttallii* is probably the result of a single gene and the two fruit types represent the phenotypes for the two alleles. Since both alleles are present in all populations, and the difference in phenotype appears to be a heritable difference, the formal recognition of these phenotypes as different forms may not be warranted. If this view is followed, than *V. nuttallii* f. *compacta* would be considered a synonym of *V. nuttallii*.

2. Present legal or other formal status

A. National:

No official status recognized nationally. Also currently not tracked nationally by the Nature Conservancy, but the species will be added to their database when the Oklahoma Heritage Program conducts its annual data exchange in April. Based on current information obtained in this survey and a similar one conducted by the Arkansas Heritage program, this species will probably be assigned a Global Rank of G3 or possibly G2 by the Nature Conservancy.

A rank of G3 is applied to species considered vulnerable globally either because they are very rare and local throughout their range, found only in a restricted range (even if abundant at some locations), or because of other factors making them vulnerable to extinction. Typically G3 species are only known from 21 to 100 populations or between 3,000 and 10,000 individuals.

A rank of G2 is applied to species considered to be imperiled globally because of rarity or because of other factors making them very vulnerable to extinction. Typically G2 species are only known from 6 - 21 populations, or few remaining individuals (between 1,000 to 3,000).

B. State:

No official status in Oklahoma, but now tracked by the Oklahoma Natural Heritage Program (as of 1999). This species is currently not ranked within Oklahoma, but will probably be assigned a state rank of S2 on the basis of this survey. Within Oklahoma a rank of S2 is assigned to species considered to be imperiled in the state because of rarity or because of some factor making them very vulnerable to extirpation in the state. Plants ranked S2 typically are known from only 6 to 20 populations.

3. Description

A. General non-technical description:

Nuttall's cornsalad is a small, upright, herbaceous plant with simple leaves. Most of the leaves are borne near the base of the stem and are broader towards their apex than near their base. The individual leaves are light green in color with a soft texture, and they are usually slightly toothed near the apex. The flowers are borne well above the leaves, and are grouped into large flat-topped clusters. The individual flowers are small and pure white both inside and out. The base of the flowers is narrow and tube-like, whereas the apex is divided to form five, small, flaring petals.

B. Technical description:

Plants erect, robust (10-) 15 - 35 (-45) cm tall. **Stems** weakly angled, usually glabrous or occasionally sparsely ciliate along the angles. Leaves mostly basal, obovate-spathulate or elliptic-spathulate, gradually decreasing in size toward the apex of the stem, sometimes laxly toothed distally, the uppermost leaves much smaller, oblong to narrow deltoid; leaf bases clasping; leaf apices retuse, blunt or broadly acute. **Inflorescences** cymose, showy, many-flowered, with the individual flowers exserted well beyond the bracts. **Outer bracts** obovate, elliptic, or oblong, sometimes asymmetric; margins glandular-ciliate, often narrowly scarious, with the glands and margins often suffused with reddish-purple pigments; apices acute or briefly acuminate. **Inner bracts** narrowly elliptic to lanceolate or subulate; margins more or less glandular-ciliate; apices briefly acuminate to subulate, frequently somewhat falcate. **Corolla** salverform, tube white, 2.5 - 5.0 mm long, with a knob-like nectary at or above the midpoint (1.5 - 3.5 mm above the base); limb white, 5.0 - 7.0 mm across, obviously irregular, the ventral lobes longer and more pointed than the dorsal lobes. **Stamens** prominently exserted, 1.5 - 3.0 mm long; pollen white. Style very prominently exserted, 1.5 - 3.0 mm long; stigma obscurely to prominently 3-lobed. **Fruits** 1. 5 - 3.0 mm long, 1.5 - 3.0 mm in diam., often nearly orbicular in outline; fertile locule narrowly oblong, with a longitudinal medial groove, sometimes also provided with a small white crest on either side of the medial groove; sterile locules widely divergent, their combined breadth 2 - 3 times that of the fertile locule, or not divergent, the distal surface glabrous or sparsely to densely hirsute, the apex truncate.

C. Field characters

Valerianella nuttallii is the only species of *Valerianella* that occurs within the region with pure white, tubular flowers that exceed the subtending bracts of the inflorescence. The species is somewhat similar in appearance to *Valerianella longiflora* (Torrey & Gray) Walp. (long tube cornsalad), but the individual flowers in this species are much longer, 7.0 - 11.0 mm as opposed to 2.5 - 5.0

mm, and the tubular portion of the corolla is tinged with pink or rose. In addition, *Valerianella longiflora* seems to prefer sites that are dryer than the localities where *V. nuttallii* is found. These sites typically have a pronounced slope, the soil is often mixed with gravel, and there is usually no evidence of standing water nearby. In contrast *V. nuttallii* is most frequently found near the bottom of shallow roadside depressions, in areas without any apparent slope, on heavy clay soils, generally in the vicinity of standing water. As a result, the two species are rarely found at the same site. (These differences are apparent in the color figures provided for these two species.)

Valerianella nuttallii is often found growing with *Valerianella radiata* (L.) Dufr. (common beaked cornsalad), an extremely common, widespread species, but it is easy to distinguish the two species. *Valerianella radiata* has extremely small, white flowers, less than 1.5 mm long, that barely extend above the bracts. The individual plants are usually found in among taller vegetation than is typical for *V. nuttallii*, and the plants are fairly lax and scrambling in habit.

Based upon our field work there was no evidence of any interspecific hybridization between *V. nuttallii* and *V. radiata* or *V. longiflora*, but a putative hybrid population (*V. nuttallii* X *V. longiflora*) was reported from a location in Arkansas by Eggers (1969).

4. Geographical distribution: See maps in Appendix.

A. Geographic range

i. Nuttall's cornsalad is restricted to eastern Oklahoma and western Arkansas. Its historical range within Arkansas included Crawford, Franklin, Sebastian, Logan, Polk and Hot Spring counties. In Oklahoma it has been reported from Cherokee, Muskogee, McIntosh, Haskell, Latimer, Le Flore, Pushmataha and McCurtain counties.

ii. Within Oklahoma *V. nuttallii* is currently known from McIntosh, Muskogee and Haskell counties. This represents a significant decrease in range from historical accounts for the species, and a similar decrease in range is also apparent within Arkansas.

5. General environment and habitat description

A. Nuttall's cornsalad occurs in open areas with a low ground cover of herbs and grasses, that are generally less than 40 cm tall. It is never found among taller grasses or herbs, or in association with shrubs or small trees. The species prefers shallow, heavy clay soils, often overlaying sandstone. It is most frequently found near the bottom of very broad roadside ditches or other shallow depressions where standing water can accumulate after the spring rains. Sites with little or no slope appear to be preferred. It also occurs in hay meadows when similar conditions exist, and grazing pressures are not too heavy. Within eastern Oklahoma the preferred habitat for *V. nuttallii* seems to be broad roadside ditches that are subject

to annual mowing and overflow hay meadows that are not grazed on a regular basis each season.

B. It is most commonly found in small clumps of 10 - 50 individuals often separated from other clumps of similar size by 30 to 50 meters. In areas where suitable habitat is extensive these small populations may form metapopulations that extend for considerable distances along some road sides and the adjacent hay meadows. The largest such metapopulation observed during the previous field season consisted of over 10,000 individuals and extended approximately 10 km along both sides of State Highway 26.

C. *Valerianella nuttallii* flowers from mid-April through mid-June. Mature fruits occur from mid-May through June

D. Associated species: *Achillea millefolium* L., *Allium stellatum* Nutt. ex Ker.-Gawl., *Amorpha canescens* Pursh, *Castilleja coccinea* (L.) Spreng., *Coreopsis grandiflora* Hogg ex Sweet, *Coreopsis tinctoria* Nutt., *Delphinium carolinianum* Walt., *Echinacea pallida* (Nort.) Britt., *Erigeron strigosus* Muhl. ex Willd., *Galium* sp., *Juncus torreyi* Cov., *Monarda fistulosa* L., *Oxalis dillenii* Jacq., *Physalis* sp., *Rubus flagellaris* Willd., *Rudbeckia hirta* L., *Trifolium reflexum* L., *Triodanis perfoliata* (L.) Nieuw., *Valerianella longiflora* (Torrey & Gray) Walp., *Valerianella radiata* (L.) Dufr., *Vinca americana* Muhl. ex Willd.

II. Assessment of Threats:

Based upon historical collections, *V. nuttallii* used to occur in six counties within Arkansas and an additional nine counties within Oklahoma. However, current evidence suggests that the species has been extirpated from all but three counties within Oklahoma, and all but three counties within Arkansas. Judging by our current status surveys for this species, *V. nuttallii* now occupies only about 40% of its historical range.

Factors which have had an unfavorable impact on this species probably include habitat destruction through the conversion of native grasslands to agriculture, as well as increased pressure from livestock grazing. Current populations occur primarily along roadsides in areas that are mowed annually, as well as in hay meadows that are only subject to occasional grazing. The populations in hay meadows are frequently adjacent to roadside populations and may represent recolonization by *V. nuttallii* after grazing pressures are reduced. Fields that are actively being grazed rarely contain *V. nuttallii.*

Other activities that have probably impacted *V. nuttallii* include improvements to drainage along roadsides, herbicides, and in some cases the suspension of regular roadside mowing. *Valerianella nuttallii* appears to have fairly specific habitat requirements. The species is only found in areas with open, low growing herbs grasses and sedges, and it requires almost waterlogged soils. If roadside drainage is

improved or the site is allowed to become overgrown, the species is quickly excluded from these areas.

Currently the Oklahoma Highway Department relies primarily upon mowing to remove excess vegetation along highways, and most highway districts try to mow at least twice a year. If the mowing occur in late summer or early fall, and again after the *V. nuttallii* has set seed (early to mid June) this is probably beneficial to the species. However, if the spring mowing occurs too early (mid to late May) yearly fruit set would be adversely affected. Local highway districts appear to have a great deal of autonomy concerning their mowing schedules (provided the job gets done) and it would probably be beneficial from the standpoint of *V. nuttallii* if the spring mowing at known sites could be scheduled later in their rotation. This would allow more time for fruit set.

It should also be stressed that areas with *V. nuttallii* seems to require regular mowing or excess vegetation accumulates and the species is quickly excluded from these sites. If roadside mowing were to be discontinued in Muskogee, McIntosh and especially Haskell county, or the Highway Department was to increase its reliance on herbicides to perform the same function, this would have a severe impact on most populations of *V. nuttallii* in Oklahoma.

III. Information Sources

1. Literature:

Adanson, M. 1763. *Polypremum* and *Fedia in* Familles des plantes. 1: 151-152. Vincent, Paris.

Eggers Ware, Donna M. 1969. A revision of *Valerianella* in North America. Unpublished dissertation submitted to the Faculty of the Graduate School of Vanderbilt University, Nashville, Tennessee.

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Ferguson, I. K. 1965. The genera of Valerianaceae and Dipsacaceae in the Southeastern United States. Journ. Arnold. Arboretum, 46: 218-231.

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Small, J. K. 1903. Flora of the southeaster United States. 1128-1129. pp. 1394. Published by author, New York.

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Taylor, R. J., and C. E. S. Taylor. 1989. An Annotated List of the Ferns, Fern Allies, Gymnosperms and Flowering Plants of Oklahoma. 1st edition. pp. 83. Southeastern Oklahoma State University. Durant, OK.

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Torrey, J. & A. Gray, 1841. *Fedia in* Flora of North America 2: 46-53. Wiley and Putnam, New York.

Wallis, C. S. 1954. Valerianella in Cherokee County, Oklahoma. Proc. Ok. Acad. Sci. 33: 172.

Waterfall, U. T. 1969. Keys to the Flora of Oklahoma. 4th edition. Oklahoma University Bookstore, Stillwater, Oklahoma.

2. Herbarium collections:

Historical sites of *Valerianella nuttallii* from Robert Bebb Herbarium, University of Oklahoma, Norman (OKL), Oklahoma State University, Stillwater (OKLA), and the Missouri Botanical Gardens Herbarium (MO).

(1) **Atoka County,** Oklahoma. Limestone Gap "Indian Territory, USA" Geo. D. Butler (101) May 19, 1877 (MO sheet number 139909).

Limestone Gap "Indian Territory, USA" Geo. D. Butler (11109) May 23, 1877 (MO sheet number 139908).

Limestone Gap "Indian Territory, USA" Geo. D. Butler s. n. 1875 (MO sheet number 139906).

(2) **Cherokee County,** Oklahoma. 3 miles east of Fort Gibson on State Highways 10 and 1 north. Open edges of Elm woods. C. S. Wallis (6638), May 19, 1958 (OKL, sheet number 133017).

Bayou valley 8.2 miles east of Fort Gibson and 1 mile north of U.S. 62 and State Road number 10, in open field. C. S. Wallis (1111) May 11, 1952 (OKLA sheet number 117307).

5 miles east of Fort Gibson and 1 mile north of U.S. 62 and State 10, weedy creek bank. C. S. Wallis (1105-A), May 11, 1952 (OKLA sheet number 117308).

4.5 miles east of Fort Gibson and 1 mile north of U.S. 62 and State 10, along open roadside ditch. C. S. Wallis (1104), May 11, 1952 (OKLA sheet number 117309).

1.6 miles east of Fort Gibson and 1 mile north of U.S. 62 and State 10, in semi-open elm-woods along creek. C. S. Wallis (1099), May 11, 1952 (OKLA sheet number 117310).

3.7 miles east of Fort Gibson, in abandon field along creek. C. S. Wallis (381), May 6, 1951 (OKLA sheet number 117311).

(3) **Haskell County,** Oklahoma. Roadside of State Highway 9 near Whitefield, at a creek viaduct. P. Folley (327), May 6, 1990 (OKL, sheet number 180066).

Fields, 2.5 miles south of Whitefield, on State Highway 2. (Sec.36;R 20 E; T 9 N). D. M. Eggers, P. L. Redfearn, Jr. and F. Bowers (1860), May 1, 1966 (OKL, sheet numbers 133019 and 145398; MO sheet number 1972193).

Pastures, ¾ mile to 1 mile west of Stigler on State Highway. (Sec.13; R20 E; T 9 N). D. M. Eggers, P. L. Redfearn, Jr. and F. Bowers) (1852), May 1, 1966 (OKL, sheet number 133018; MO sheet number 1972193).

3 miles west of Stigler. Rich meadow soil. Clark and Devitt (32), May 14, 1939 (OKL, sheet number 133020).

(4) **Latimer County,** Oklahoma. One mile west of Talihina on Highway 1. Along roadside in disturbed soil between highway and fench. P. Buck (3001), April 18, 1985 (OKLA sheet number 137838).

Wooded hillside, Eastern Oklahoma State College. F. H. Means, Jr. (279), April 23, 1963 (OKLA sheet number 117322).

Robbers Cave State Park. Disturbed soil. G. J. Goodman (7111a), May 6, 1961 (OKL sheet number 133022).

9 miles north of Wilburton. Dry sandstone ledges and boulders in Oak-Hickory forest. M. Hopkins and G. L. Cross (1489), May 30, 1940 (OKL sheet number 133021).

Latimer county without a specific location. Open woods and roadside. R. Bebb (5380), April 19, 1937 (OKL sheet number 133023).

(5)**Le Flore County,** Oklahoma. Rt.112, 2.3 to 3 miles east of US Highway 59. Grassy roadside. M. Huft and M. Goodman (1199), May 15, 1980 (OKL sheet number 147042).

Wister Dam area. R. Whitmire (no number), May 12, 1950 (OKL sheet number 133027).

Moist meadow near Albion. M. Hopkins and M. Van Valkenburgh (4329), May 20, 1939 (OKL sheet number 133026; OKLA sheet number 117312).

2 miles north of Talahina. Wet open meadow on the border of rich woods. M. Hopkins and G. L. Cross (1769), May 9, 1937 (OKL sheet number 133025).

Pine Valley. G. J. Goodman (2496), May 3, 1935 (OKL sheet number 133024).

(6) **McCurtain County,** Oklahoma. 15 miles north of Broken Bow on ridge near hairpin curve. Shallow stony soil. U. T. Waterfall (11372), April 19, 1953 (OKL, sheet number 133028; OKLA sheet number 117318).

(7) **Muskogee County,** Oklahoma. Greenleaf State Park, 18 miles southeast of Muskogee. East facing slope. J. and C. Taylor (10251), April 29, 1972 (OKL sheet number 133029).

2 miles southwest of Warner. Eroded bank above stream. G. J. Goodman (7451a), May 5, 1963 (OKL sheet number 133035). Found growing with *V. longiflora.*

3 miles east of Warner, praire hillside, shallow soil. U. T. Waterfall (12348, 12348a), May 6, 1955 (OKLA, sheet number 117305, 117306).

Near Braggs, opening at edge of woods. U. T. Waterfall (9382), May 5, 1950 (OKLA sheet number 117316).

Braggs Hill, in shaded woods of Canyon. R. Bebb (5336), May 28, 1940 (OKL, sheet number 133033).

Braggs Hill, among brush and trees. R. Bebb (5109), May 2, 1940 (OKL, sheet number 133039).

Braggs Hill. R. Bebb (5160), May 6, 1940 (OKL sheet number 133032).

Rocky hill 5 miles S. W. of Muskogee. R. Bebb (3890), May 6, 1939 (OKL sheet number 133038; OKLA sheet number 117313).

Braggs Hills in the Cherokee Hills, 5 miles east of Fort Gibson. Limestone slopes and bluffs in a deeply shaded and wooded ravine. M. Hopkins (4010), April 28, 1939 (OKL sheet number 133036).

Braggs Hill, rocky woods. R. Bebb (3463), May 19, 1935 (OKL sheet number 133031).

Braggs Hill. R. Bebb (3741), April 28, 1931 (OKLA sheet number 117314).

2 miles east of Warner. Sec. 24. T 12 N: R 19 E. E. L. Little (1575), May 15, 1927 (OKL, sheet number 133030).

(8) **Pushmataha County,** Oklahoma. 2.5 miles south of Whitefield on OK 2. Sec. 36, R20 E, T 9N. D. M. Eggers, P. L. Redfearn, Jr., and F. Bowers (1860), May 1, 1966 (OKLA sheet number 117321).

Along U.S. 271, about 0.4 miles south west of Le Flore - Pushmataha Co. line, NW 1/4 sec. 1; R 21 E: T 2 N. D. M. Eggers, P. L. Redfearn, Jr., and F. Bowers (1877), May 1, 1966 (OKLA sheet number 117321; MO sheet number 1972200).

3 miles east and 1 mile south of Albion. Opening in woods. U. T. Waterfall (11393), April 19, 1953 (OKL, sheet number 133040; OKLA sheet number 117315).

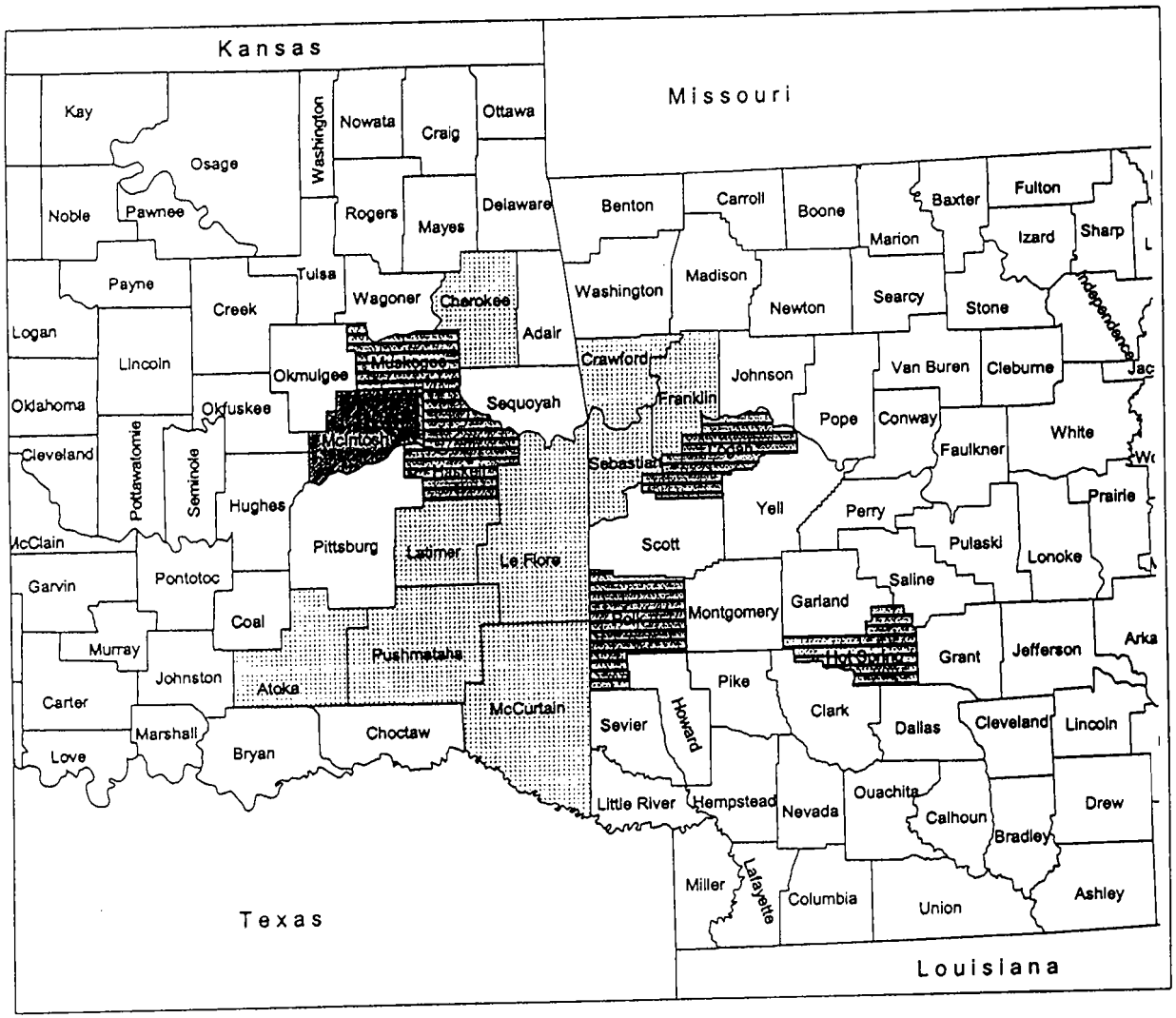
2.5 miles east and 1 mile south of Albion, opening in woods. U. T. Waterfall (11398), April 19, 1953 (OKLA sheet number 117319).

2 miles east of Albion, in shallow stony soil. U. T. Waterfall (9333), April 16, 1950 (OKLA sheet number 117320).

4 miles east of Albion. Dry, rocky, barren woods. Hopkins and G. L. Cross (1792), May 9, 1937 (OKL, sheet number 133041).

IV. Appendices

1. General geographic distribution of *Valerianella nuttallii* in Oklahoma and Arkansas



Geographic Distribution of *Valerianella nuttallii* in Oklahoma and Arkansas

LEGEND

- Extant
- Historical & Extant
- Historical

N

20 0 20 40 Kilometers

Locator Map

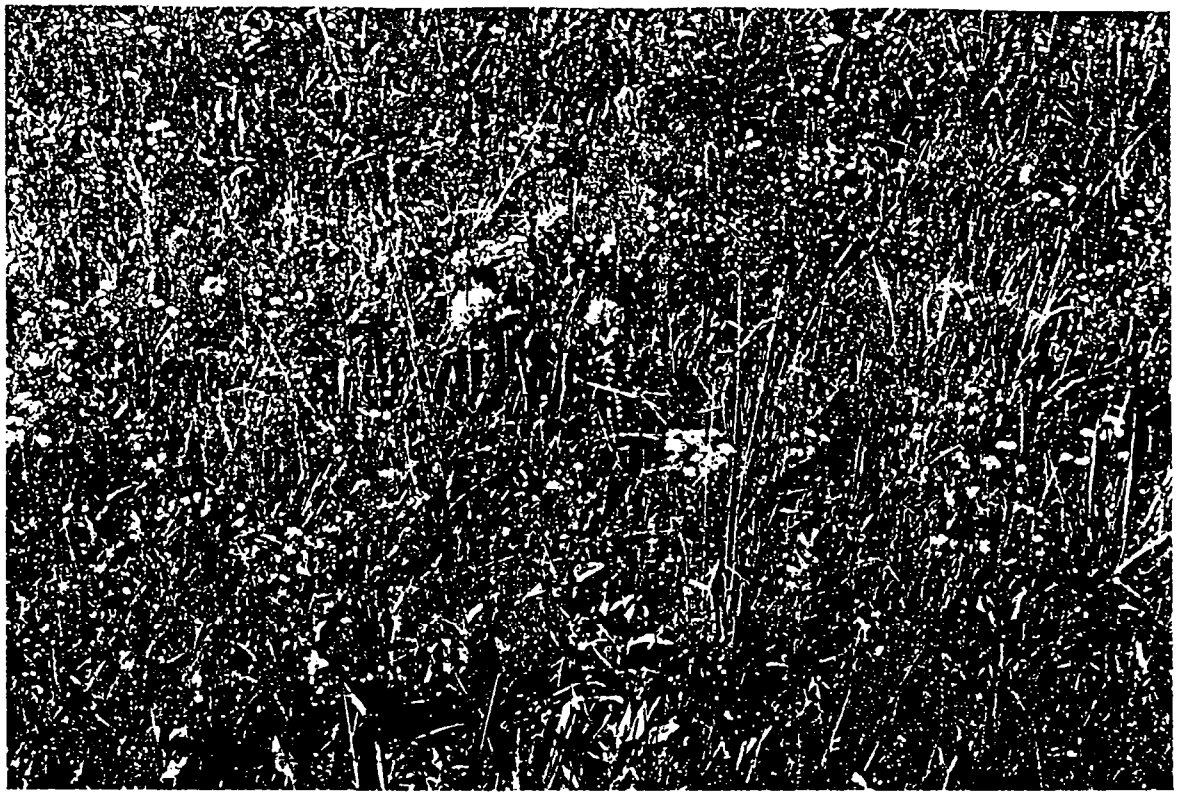
Data Source: Oklahoma Natural Heritage Inventory, Oklahoma Biological Survey

Date: February 2000

2. Photographs of *V. longiflora* plants and flowers.

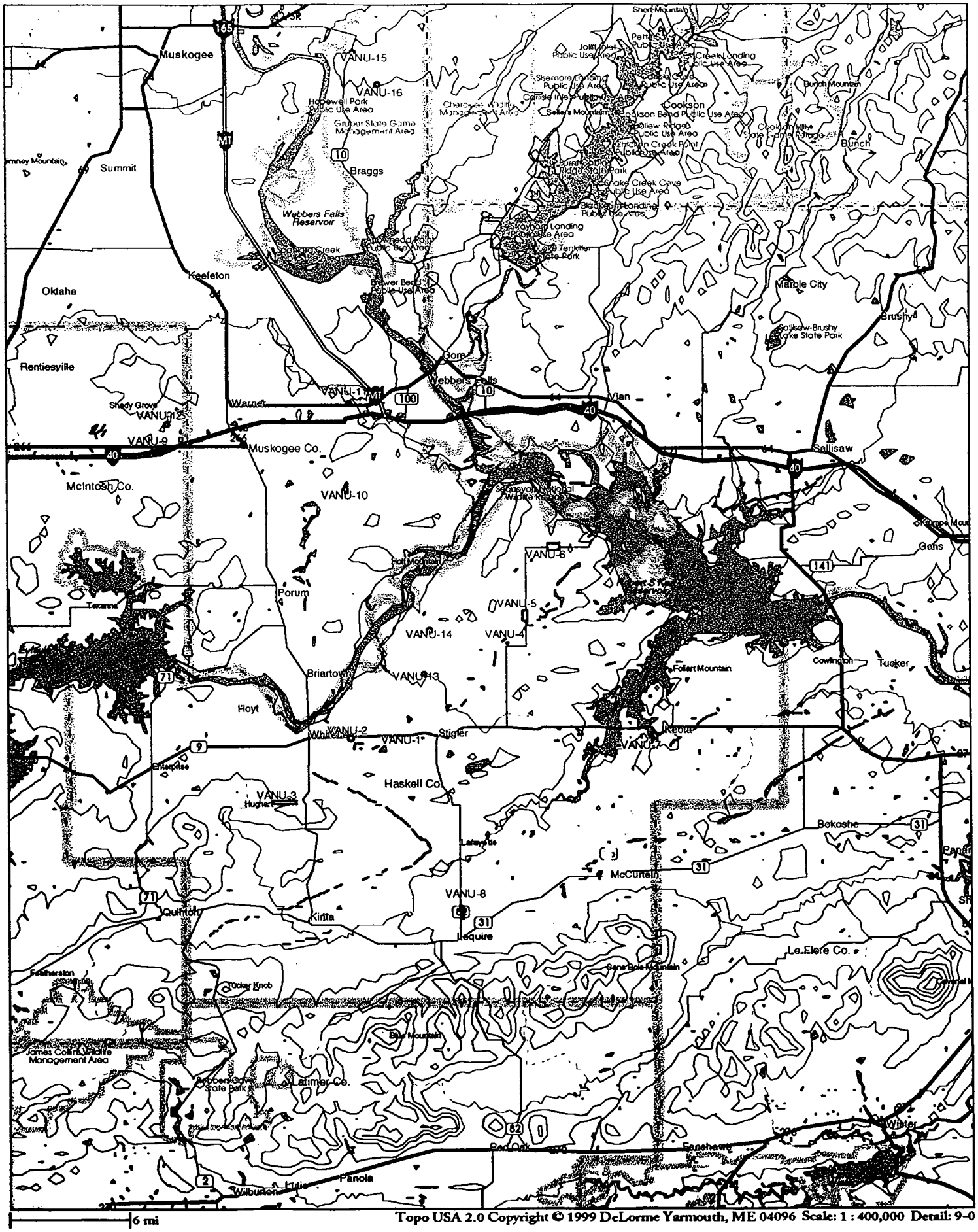
Valerianella longiflora (Torr. & Gray) Walp. Top: habit. Bottom: inflorescence. Differs from *V. nuttallii* by its longer, reddish corolla tubes.

3. Photographs of *V. nuttallii* habitat, plants and flowers



Valerianella nuttallii (Torr. & Gray) Walp. Top: habitat. Bottom left: habit. Bottom right: inflorescence.

4. Specific site information and topographic maps


Muskogee
VANU-15
VANU-16
Hopewell Park Public Use Area
Gruber State Game Management Area
Braggs
Webbers Falls Reservoir
Summit
Oktaha
Keefeton
Rentiesville
Shady Grove
VANU-12
Warner
VANU-11
VANU-9
Muskogee Co.
McIntosh Co.
VANU-10
Gore
Webbers Falls
Vian
Marble City
Brushy
Gaines
Sallisaw
Porum
Texanna
VANU-6
VANU-5
VANU-14
VANU-4
VANU-13
Briartown
Hoyt
Stigler
VANU-2
VANU-1
VANU-7
Haskell Co.
VANU-3
Hughes
Lafayette
McCurtain
Bokoshe
VANU-8
Quinton
Kinta
Haskell
Le Flore Co.
Latimer Co.
Red Oak
Panola
Wilburton
Talihina
Fanshawe
Cowlington
Tucker
Poteau
Short Mountain
Cookson
Bunch
Bunch Mountain
Jolliff Dixon Public Use Area
Skamore Landing Public Use Area
Cookson Bend Public Use Area
Sallisaw Creek Public Use Area
Brewer Bend Public Use Area
Lake Tenkiller State Park
Gallisaw-Brushy Lake State Park
Holt Memorial Wildlife Area
Follett Mountain
Blue Mountain
James Coit Wildlife Management Area
Robbers Cave State Park
6 mi
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 400,000 Detail: 9-0

5. Confirmed Sites

Site name: VANU-1

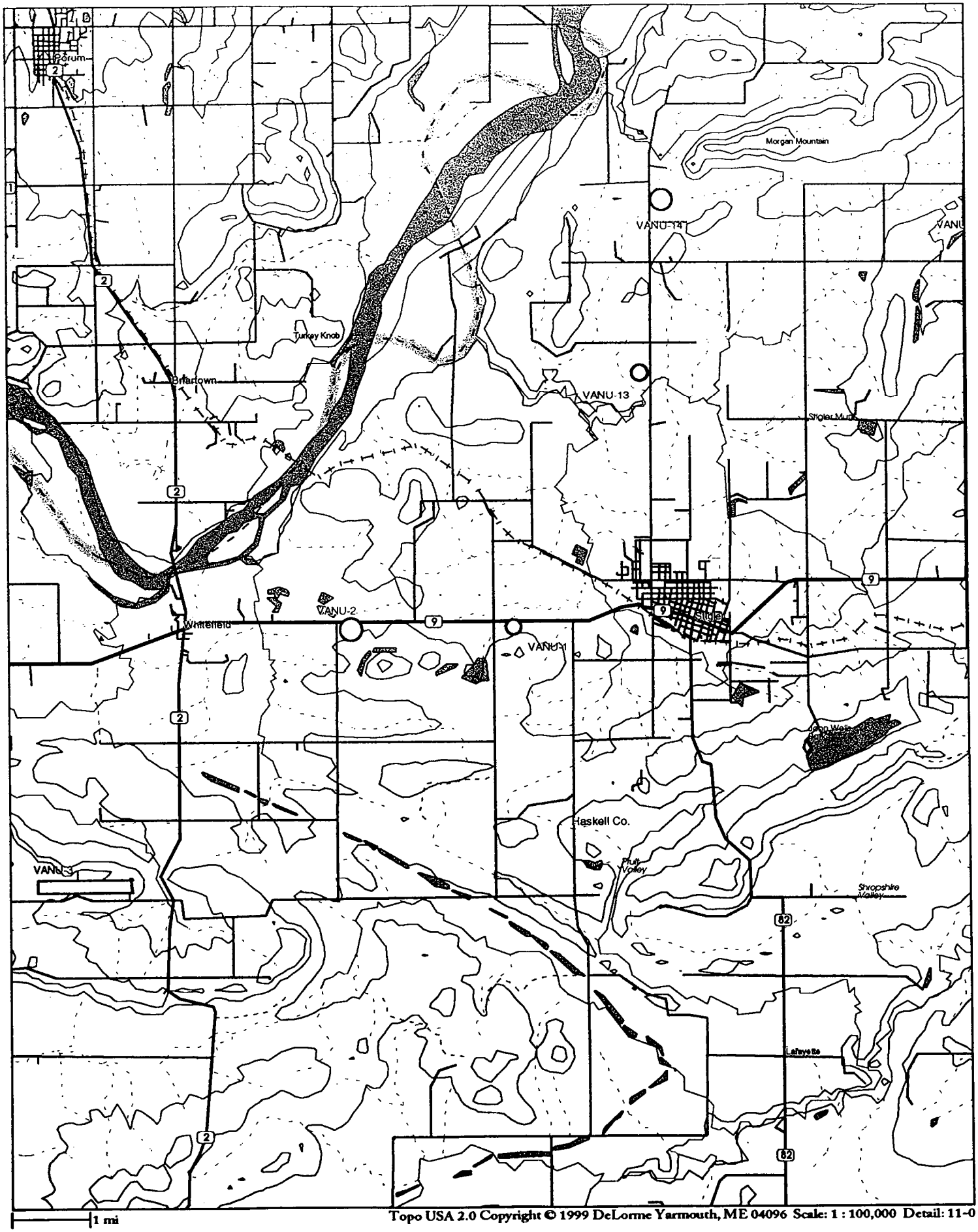
Surveyor: Paul Kores, Heather Oakley, Mia Molvray. May 12, 1999. Voucher specimen deposited at OKL.

Location: Haskell County, Oklahoma. State Highway 9, near Jackson ranch (North ditch), about 2.5 miles east of Whitefield. T 9 N R 19 E, Section 14, Stigler West quadrangle.

Population size and vigor: Two large populations approximately 150 m apart, habitat appears continuous. About 1,400 individuals present.

Habitat and description: Roadside ditch with standing water, clay soil. *V. nuttallii* growing near bottom of ditch, adjacent to standing water. *V. radiata* also present.

Threats: Premature annual mowing and herbicide use.


Morgan Mountain
VANU-14
Turkey Knob
Briartown
VANU-13
Stigler
VANU-2
Whitefield
VANU-1
Haskell Co.
Shropshire Valley
Lafayette
VANU-3
1 mi
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 100,000 Detail: 11-0

Site name: VANU-2

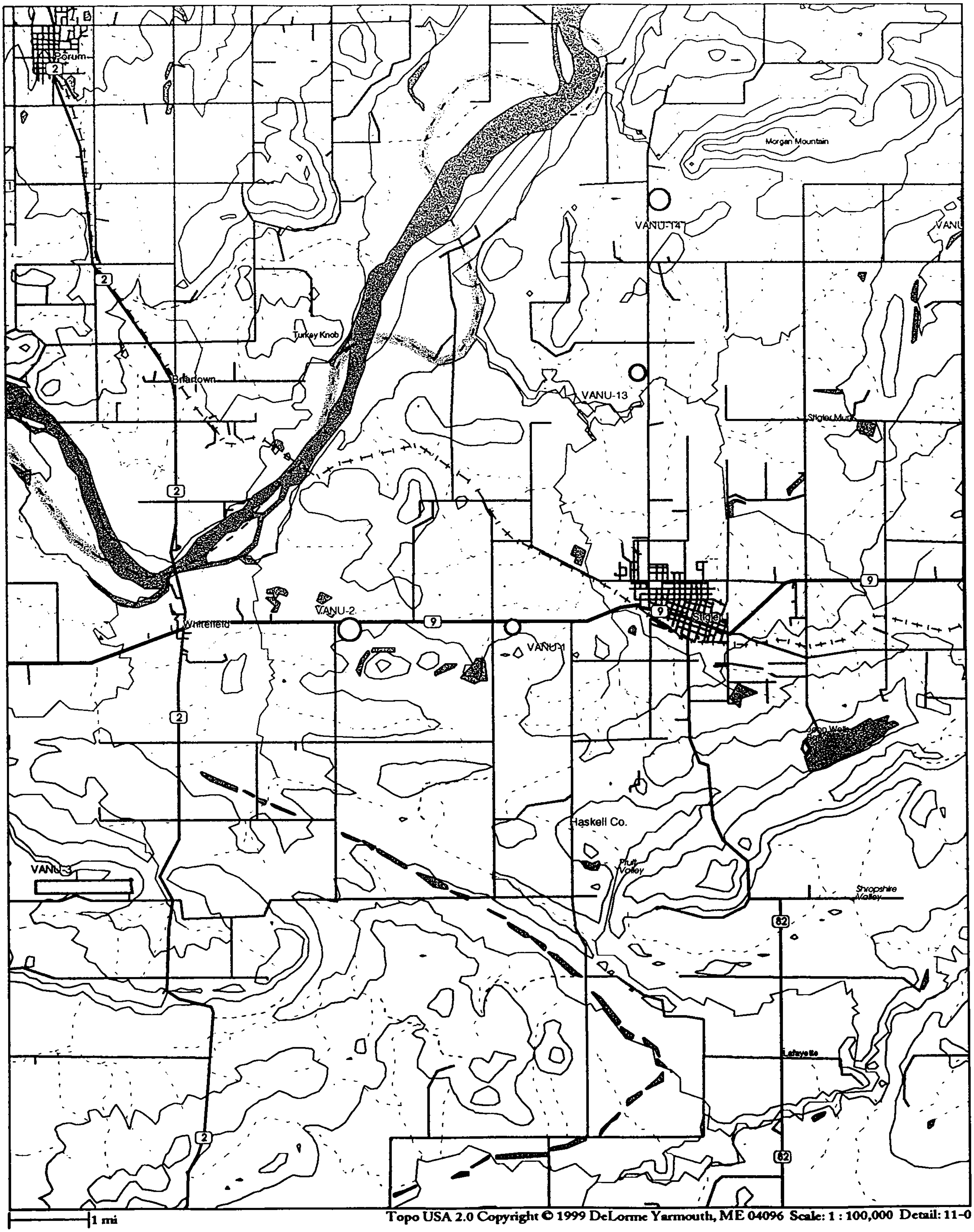
Surveyor: Paul Kores, Heather Oakley, Mia Molvray. May 12, 1999. Voucher specimen deposited at OKL.

Location: Haskell County, Oklahoma. State Highway 9, 3,75 miles west of Stigler, south side of ditch. T 9 N R 20 E, Section 16, Stigler West quadrangle.

Population size and vigor: Three moderately large populations about 25 m apart. Between 1,001 and 10,000 individuals present.

Habitat and description: Roadside ditch with standing water, clay/gravel soil, open light. *V. nuttallii* present on mid-slope of ditch. Growing with *V. radiata*.

Threats: Premature annual mowing and herbicide use.


Porum
Morgan Mountain
VANU-14
VANU
Turkey Knob
Briartown
VANU-13
Stigler Mun.
VANU-2
Whitefield
VANU-1
Stigler
Haskell Co.
Pruitt Valley
VANU-3
Shropshire Valley
Lafayette
1 mi
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 100,000 Detail: 11-0

Site name: VANU-3

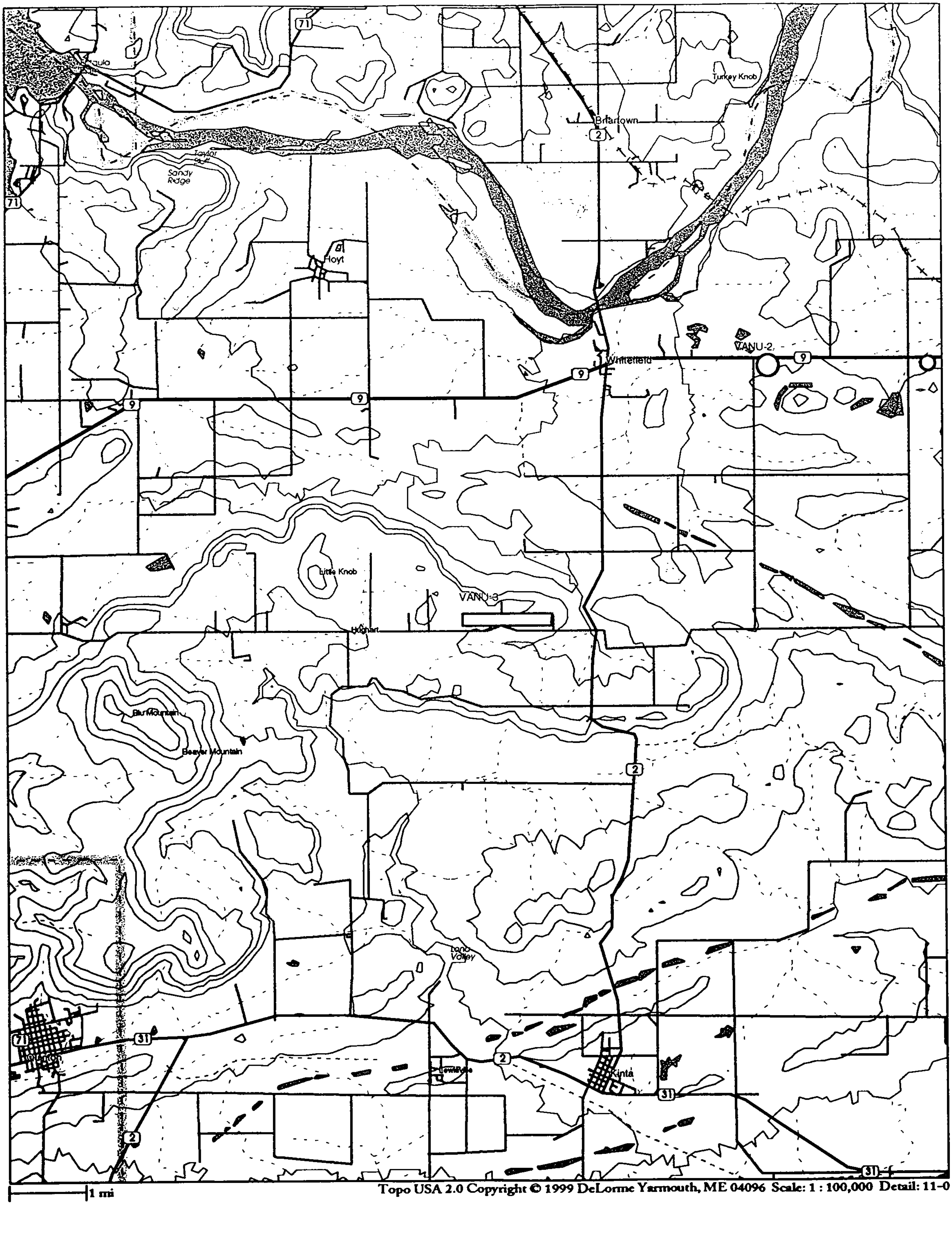
Surveyor: Paul Kores, Mia Molvray, Heather Oakley. May 12, 1999. Voucher specimen deposited at OKL.

Location: Haskell County, Oklahoma. .5 miles in on north side of Beaver Mountain Road (between Rt. 2 and Hughart). T 9 N R 19 E, section 36, Sans Bois quadrangle.

Population size and vigor: Large population of between 1,001 and 10,000 individuals extending for 165m.

Habitat and description: Roadside ditch adjacent to hay meadow. Moist clay soil, open to partial lighting. *V. nuttallii* growing along entire area of ditch. *V. radiata* also present.

Threats: Possible premature mowing.


71
Briartown
2
Turkey Knob
Taylor Bluff
Sandy Ridge
71
Hoyt
VANU-2
9
Whitefield
9
9
9
Little Knob
VANU-3
Blu Mountain
Beaver Mountain
2
Lone Valley
71
31
2
Kinta
31
2
31
1 mi
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 100,000 Detail: 11-0

Site name: VANU-4

Surveyor: Paul Kores and Heather Oakley. May 17, 1999.

Location: Haskell County, Oklahoma. County truck 8, 4.2 miles north of Highway 9. T 10 N R 21 E, Section 23, Stigler East quadrangle.

Population size and vigor: Single plant only.

Habitat and description: Roadside ditch, moist clay soil, open light. Plant growing adjacent to ditch on flat area. V. radiata also present.

Threats: Premature mowing, single plant.

1 mi Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 100,000 Detail: 11-0

Site name: VANU-5

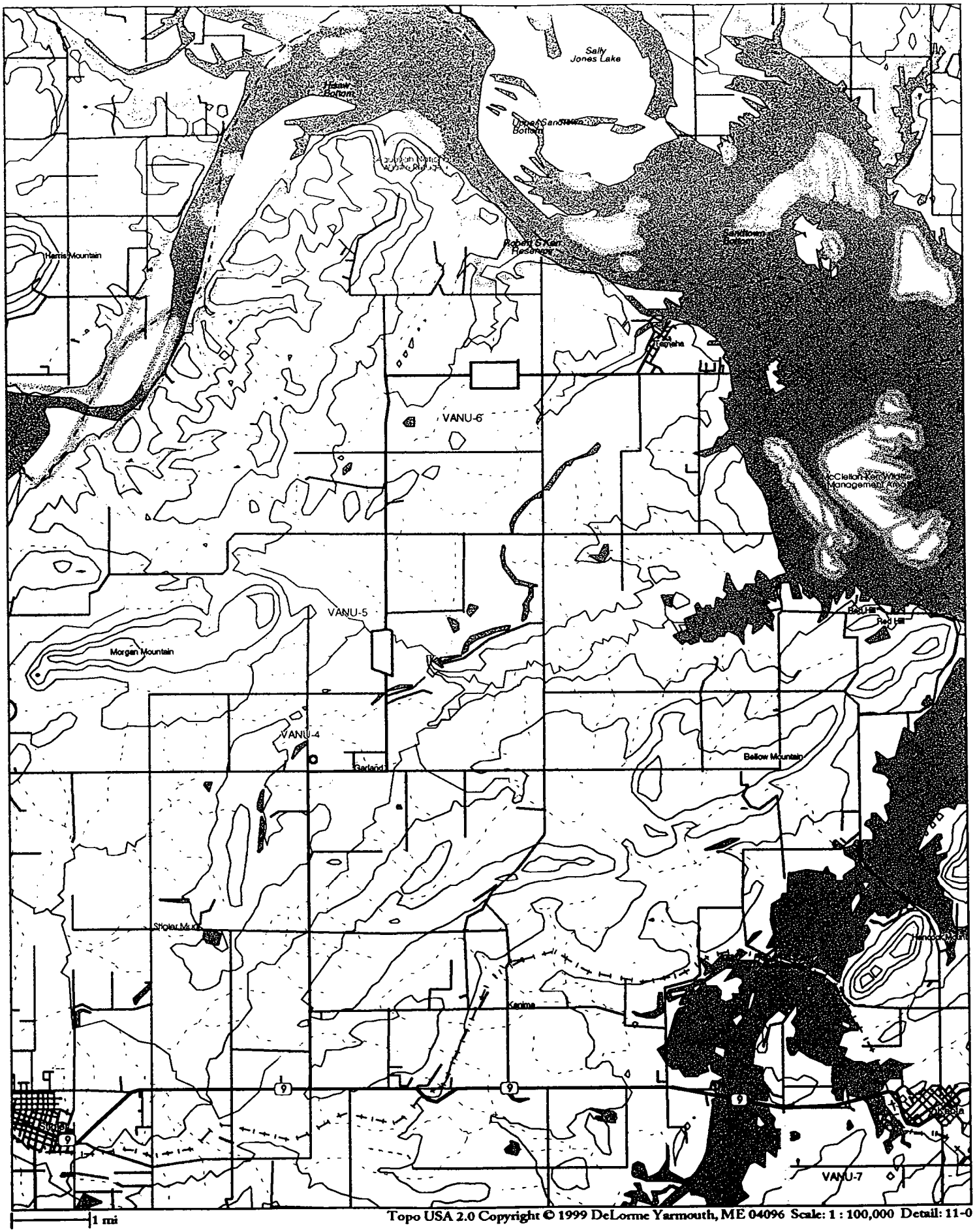
Surveyor: Paul Kores and Heather Oakley. May 17, 1999. Voucher specimen deposited at OKL.

Location: Haskell County, Oklahoma. County truck D, 6.2 miles north of Highway 9, north west of Stigler. T 10 N R 21 E, Section 13 and 14, Stigler East quadrangle.

Population size and vigor: Population of between 1,001 and 10,000 individuals extending .5 miles on both sides of road.

Habitat and description: Roadside ditches on both sides of road (ditch on one side of road includes a small rocky stream), moist clay over limestone substrate, open light. The sides of ditch adjacent to road are mowed (about 5 feet). Plants growing on opposing side of ditch (no mowing), and near the fence in adjacent hay meadow. V. radiata also present.

Threats: Premature mowing, use of herbicides, and overgrazing.


Sally Jones Lake
Harris Mountain
VANU-6
VANU-5
Morgan Mountain
VANU-4
Bellow Mountain
VANU-7
1 mi
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 100,000 Detail: 11-0

Site name: VANU-6

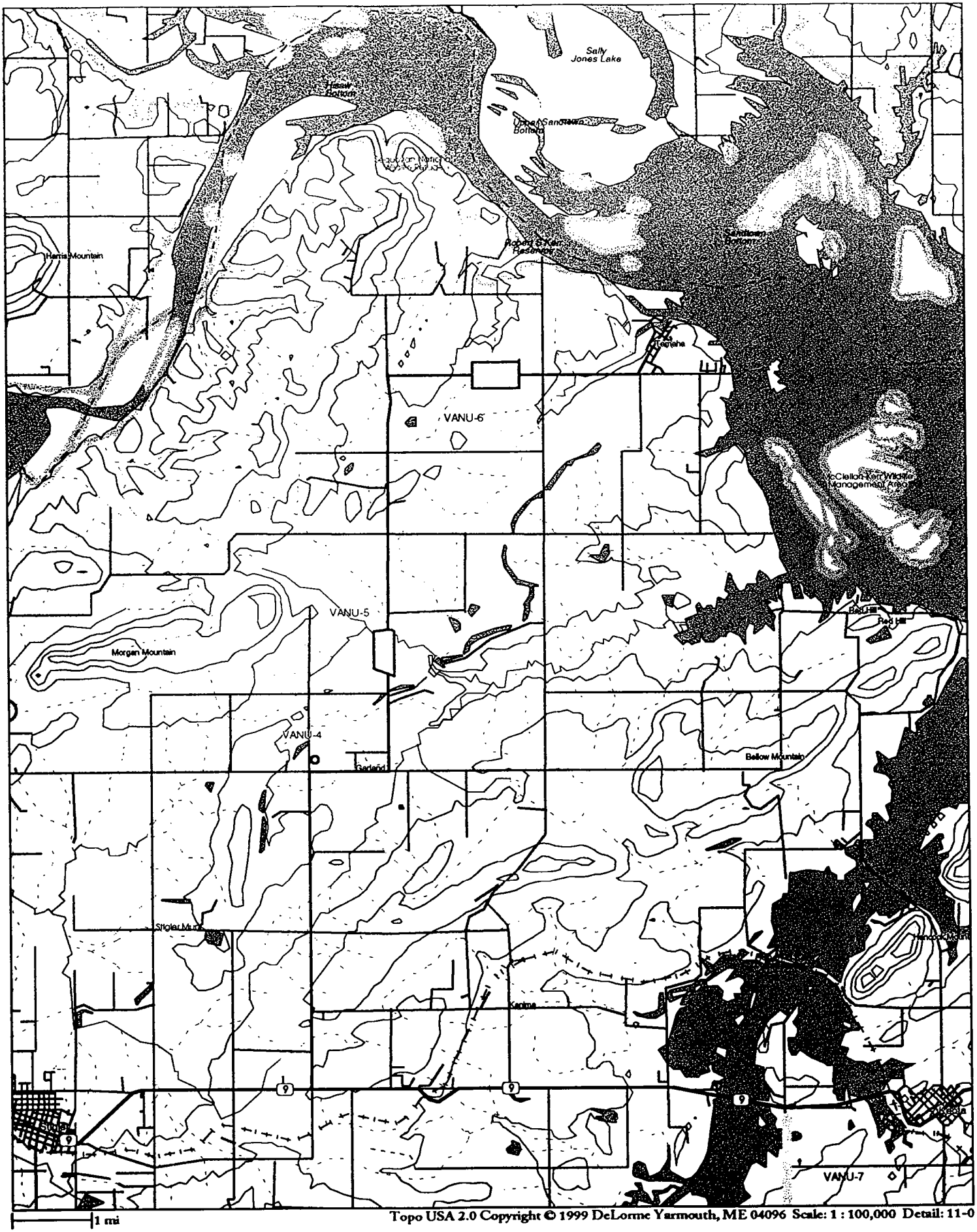
Surveyor: Paul Kores and Heather Oakley. May 17, 1999. Voucher specimen deposited at OKL.

Location: Haskell County, Oklahoma. County truck D, 11.5 miles north of Highway 9, north west of Stigler. T 11 R 22 E, Section 30 and 31, Stigler NE quadrangle.

Population size and vigor: Large population of between 1,001 and 10,000 individuals on both sides of road.

Habitat and description: Roadside ditches on both sides of road (standing water), moist, shallow limestone covered by gravel and clay, open light. Evidence of possible previous burning, site probably not mowed. Plants growing along side of ditch opposing road. *V. radiata* also present.

Threats: Possible burning or premature mowing


Sally Jones Lake
Harris Mountain
VANU-6
VANU-5
Morgan Mountain
VANU-4
Bedford
Bellow Mountain
VANU-7
1 mi
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 100,000 Detail: 11-0

Site name: VANU-7

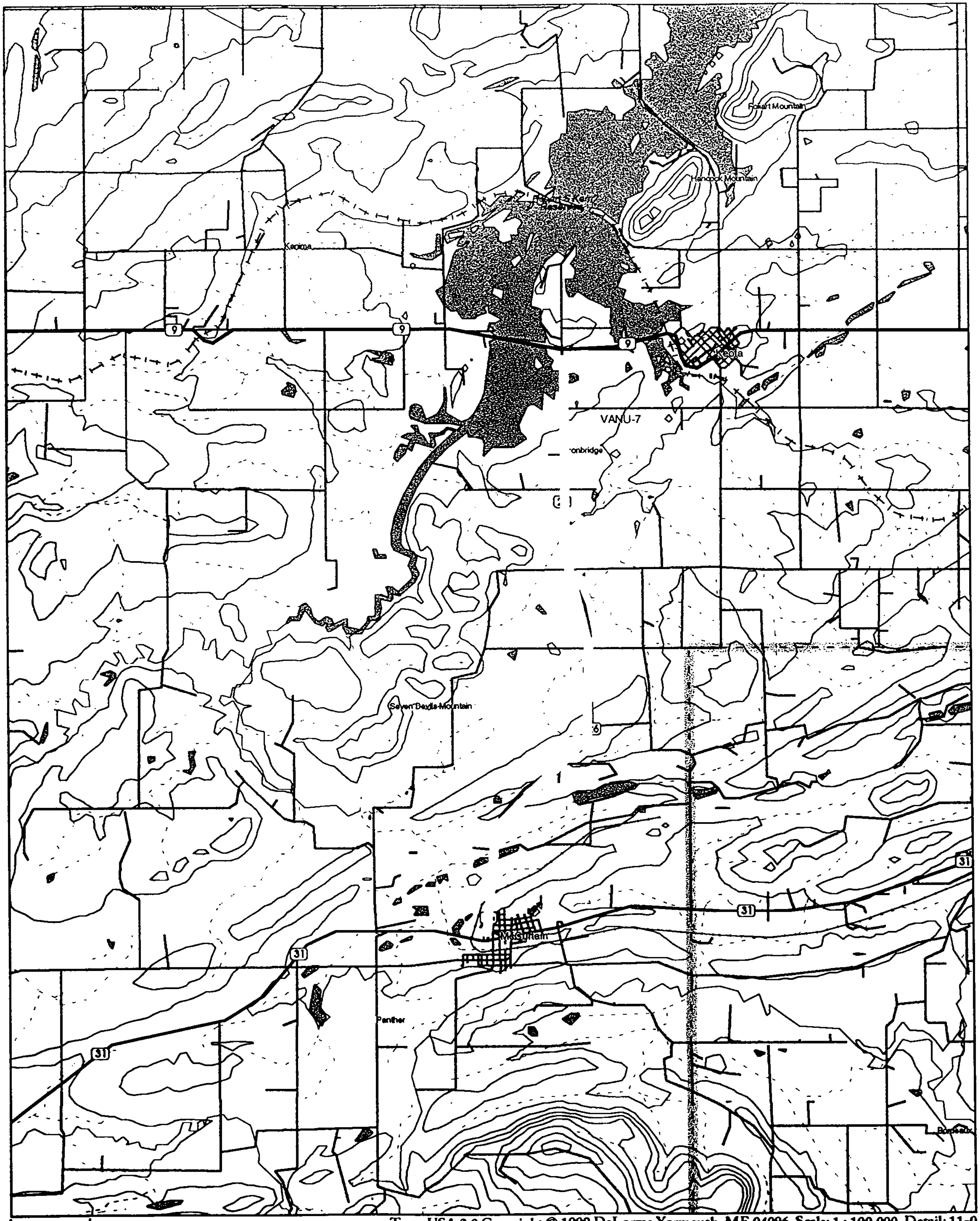
Surveyor: Paul Kores and Heather Oakley. May 17, 1999. Voucher specimen deposited at OKL.

Location: Haskell County, Oklahoma. 1.5 miles south of Highway 9 on Highway 26. T 9 N R 22 E, Sections 22, 23, 26, 27, and 34; T 8 N R 22 E, Sections 35, 2, 1, 10, 11, and 15, McCurtain quadrangle.

Population size and vigor: Very large population extending entire length of Highway 26 to Highway 31, on both sides of road. Over 10,000 individuals.

Habitat and description: Roadside ditches on both sides of road, rocky stream in base of ditch. Open light, moist clay over rocky limestone. Plants growing along side of ditch opposing road. *V. radiata* also present.

Threats: Possible premature mowing and use of herbicides.



1 mi

 Scale: 1 : 100,000 Detail: 11-0

Site name: VANU-8

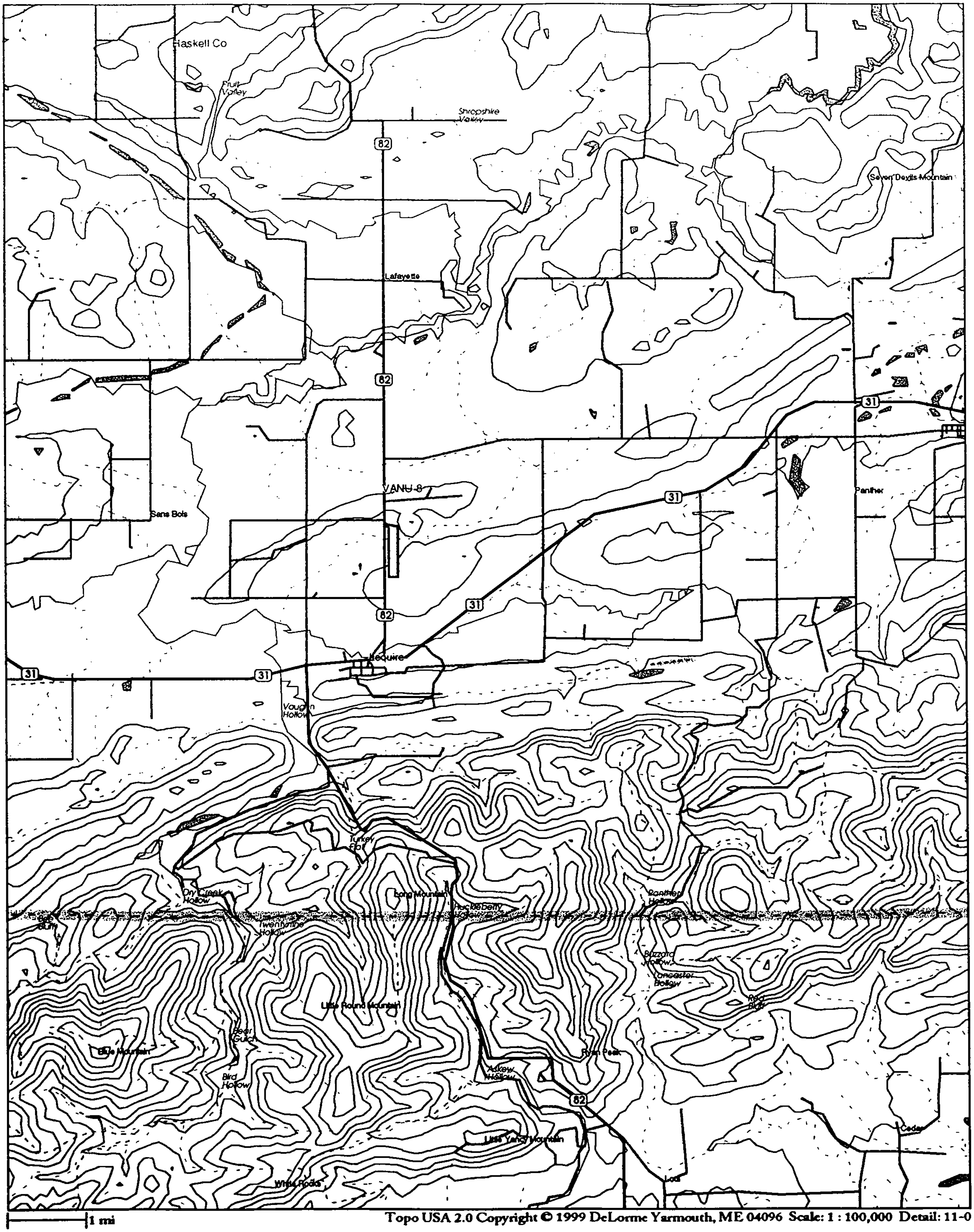
Surveyor: Paul Kores and Heather Oakley. May 17, 1999. Voucher specimen deposited at OKL.

Location: Haskell County, Oklahoma. 1 mile north of Junction 82 and 31. T 8 N R 21 E, Section 33, Le Quire quadrangle.

Population size and vigor: Population of between 1,001 and 10,000 individuals, extending 4/10 mile long, along both sides of road.

Habitat and description: Roadside ditches on both sides of road and in adjacent hay meadows. Moist clay over limestone, open light. Rocky stream at base of ditch, about 4 ft. wide. Plants growing along side of ditch opposing road.

Threats: Possible premature mowing and herbicide use, but was not apparent.


Haskell Co
Fruit Valley
Shropshire Valley
Seven Devils Mountain
Lafayette
82
VANU 8
31
Sans Bois
Panther
Turkey Flat
Long Mountain
Huckleberry Hollow
Dry Creek Hollow
Twentynine Hollow
Panther Hollow
Buzzard Hollow
Lancaster Hollow
Little Round Mountain
Bear Gulch
Blue Mountain
Bird Hollow
Ryan Peak
Askew Hollow
Little Yancy Mountain
White Rock
Cedar

1 mi

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Site name: VANU-9

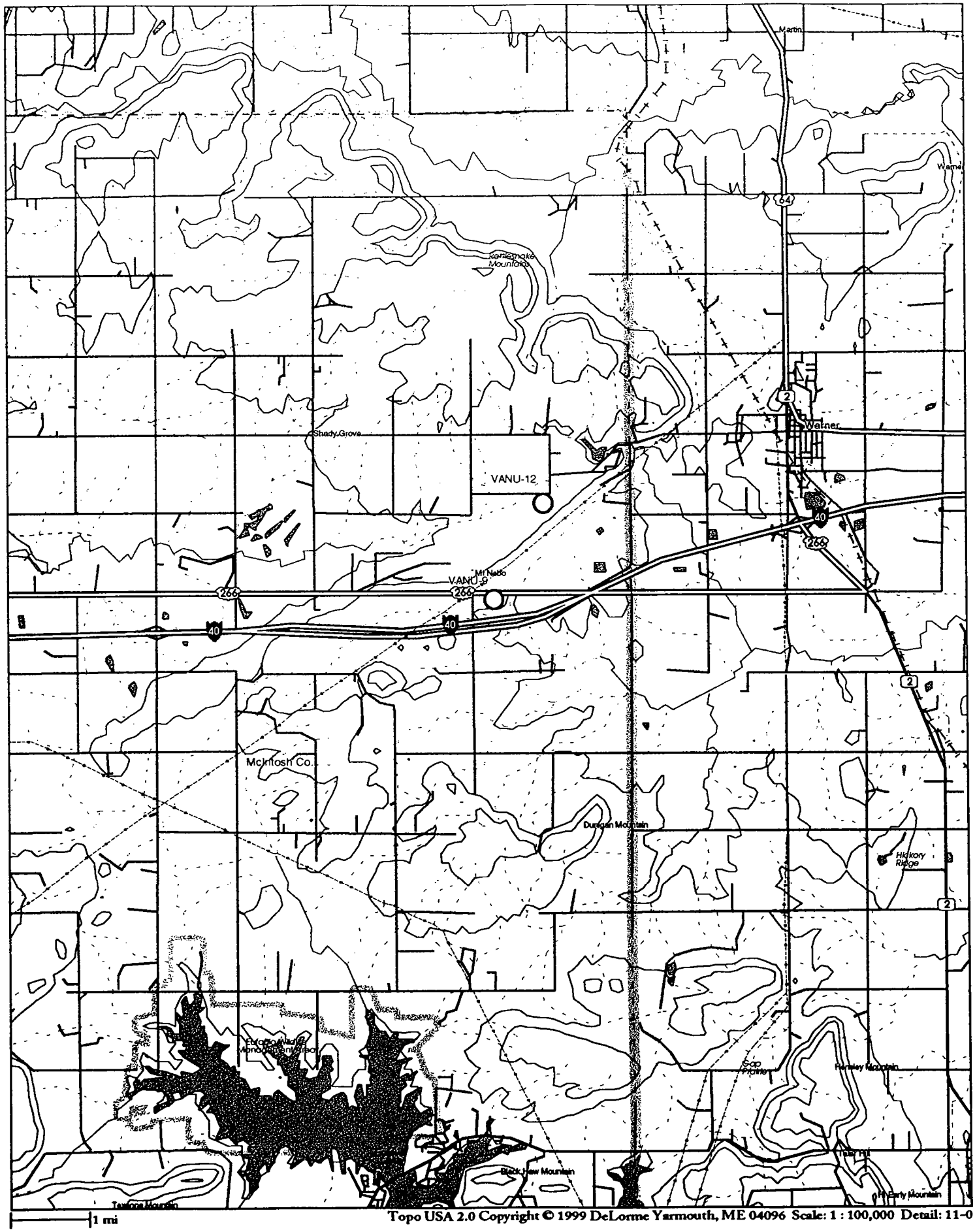
Surveyor: Paul Kores and Heather Oakley. May 19, 1999. Voucher specimen deposited at OKL.

Location: McIntosh County, Oklahoma. U.S. Highway 266, 1.5 miles west of Muskogee County line. T 11 N R 18 E, Section 2, Warner quadrangle.

Population size and vigor: Population of between 1,001 and 10,000 plants, 300 m long and 50 m wide, on the south side of road and in adjacent hay meadow.

Habitat and description: Roadside ditch and adjacent hay meadow, clay substrate, open light. Area adjacent to road is mowed (about 8 ft), *V. nuttallii* found only in unmowed area of ditch, opposing road. Meadow adjacent to ditch is used only as an overflow grazing area, therefore it is not frequently grazed. *V. radiata* also present.

Threats: Premature mowing, possible use of herbicides, and possible overgrazing in hay meadow.



Site name: VANU-10

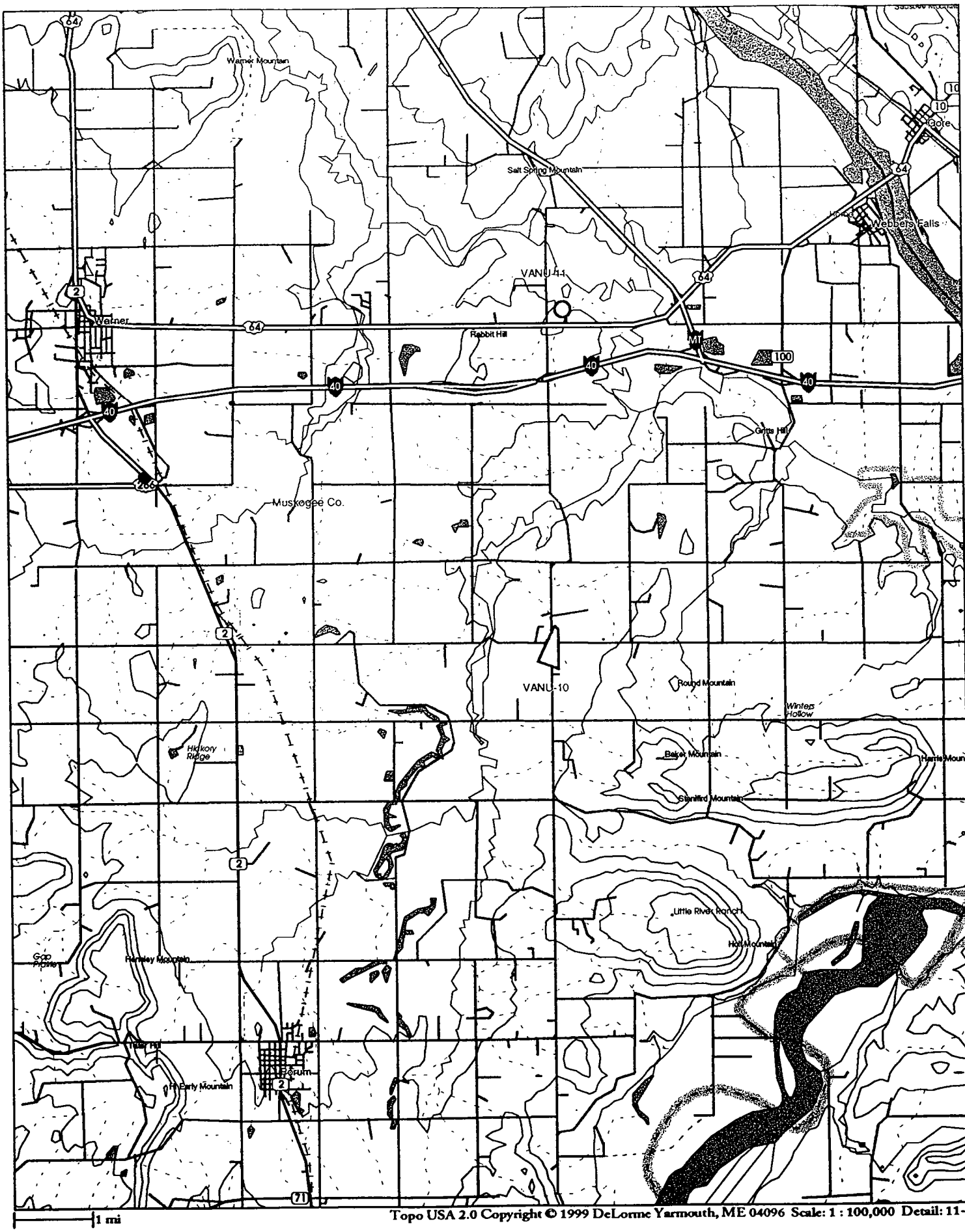
Surveyor: Paul Kores and Heather Oakley. May 19, 1999. Voucher specimen deposited at OKL.

Location: Muskogee County, Oklahoma. Intersection of NS 439 and EW 109. T 11 N R 20 E, Sections 9 and 16, Holt Mountain quadrangle.

Population size and vigor: Over 10,000 plants along both roadsides, extending 500 m and 10 to 30 m into adjacent hay meadows.

Habitat and description: Roadsides and adjacent hay meadows. Moist clay substrate with large pieces of limestone 15 to 50 cm across, open light. Woody shrubs becoming established along roadsides, no evidence of mowing. *V. radiata* also present.

Threats: Establishment of tall, woody shrubs could shade out *V. nuttallii*, and overgrazing.


Warner Mountain
Salt Spring Mountain
Webbers Falls
VANU-11
Warner
Rabbit Hill
Muskogee Co.
VANU-10
Round Mountain
Winters Hollow
Hickory Ridge
Baker Mountain
Stanifird Mountain
Little River Ranch
Hot Mountain
Hamley Mountain
Braggs
Hi Early Mountain
1 mi
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 100,000 Detail: 11-0

Site name: VANU-11

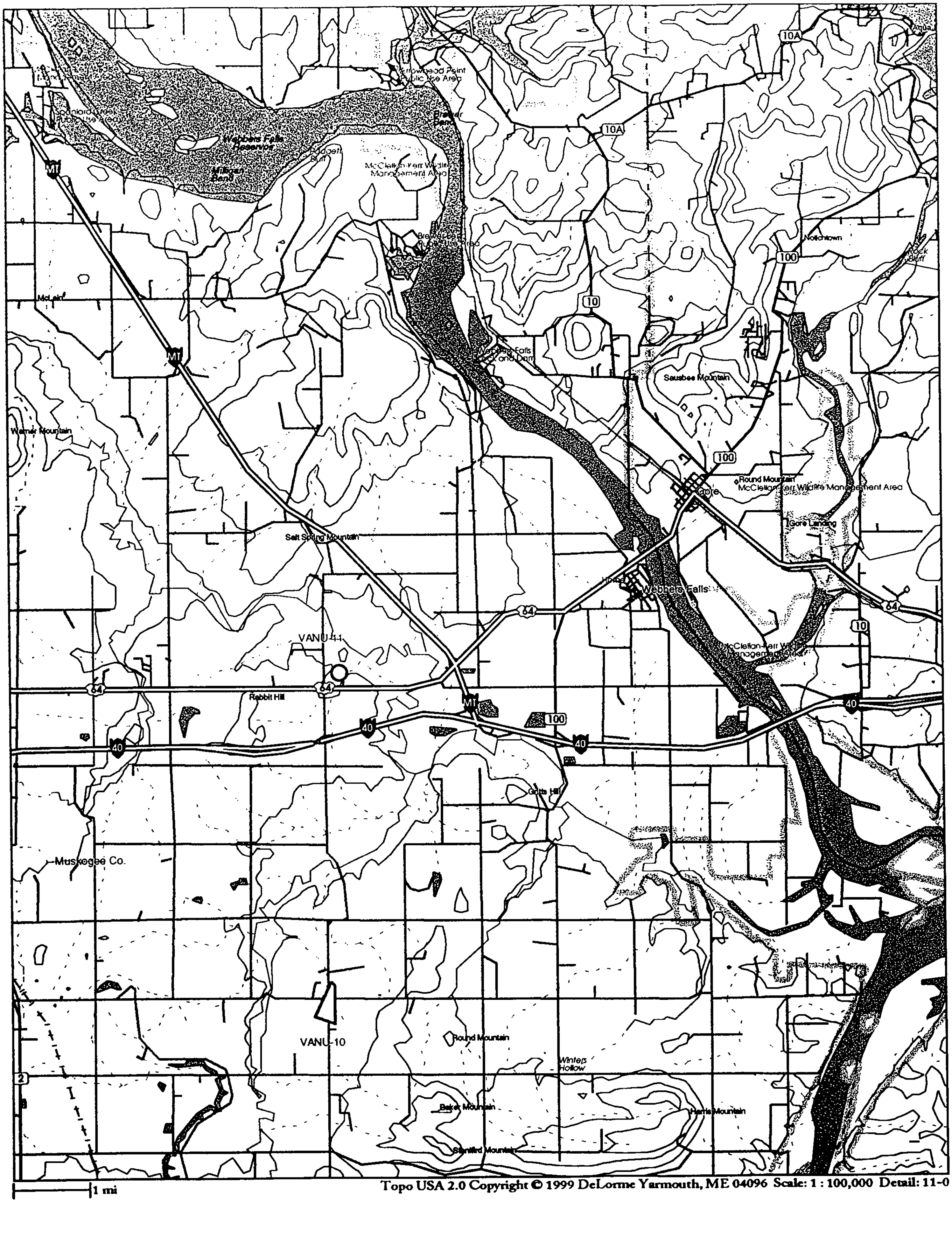
Surveyor: Paul Kores and Heather Oakley. May 19, 1999. Voucher specimen deposited at OKL.

Location: Muskogee County, Oklahoma. 3/10 mile east of Junction NS 439, on US Highway 64. T 12 N R 20 E, Section 21, Holt Mountain quadrangle.

Population size and vigor: Between 500 and 1,000 individuals extending about 110 m on north side of road.

Habitat and description: North side of road only, moist clay, limestone substrate, open light. Area adjacent to road is mowed, plants found only in unmowed area opposing roadside along slope of ditch. *V. radiata* also present.

Threats: Premature mowing and possible herbicide use.


Arrowhead Point Public Use Area
Webbers Falls Reservoir
Milligan Bend
McClellan-Kerr Wildlife Management Area
Brewer Bend
Notchtown
Rock Bluff
McLain
Webbers Falls Lock and Dam
Sausbee Mountain
Werner Mountain
Round Mountain
McClellan-Kerr Wildlife Management Area
Gore
Gore Landing
Salt Spring Mountain
Webbers Falls
VANU-11
Rabbit Hill
Gitts Hill
Muskogee Co.
VANU-10
Round Mountain
Winters Hollow
Baker Mountain
Harris Mountain
Stanfird Mountain
10A
10
100
64
40
2
1 mi
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 100,000 Detail: 11-0

Site name: VANU- 12

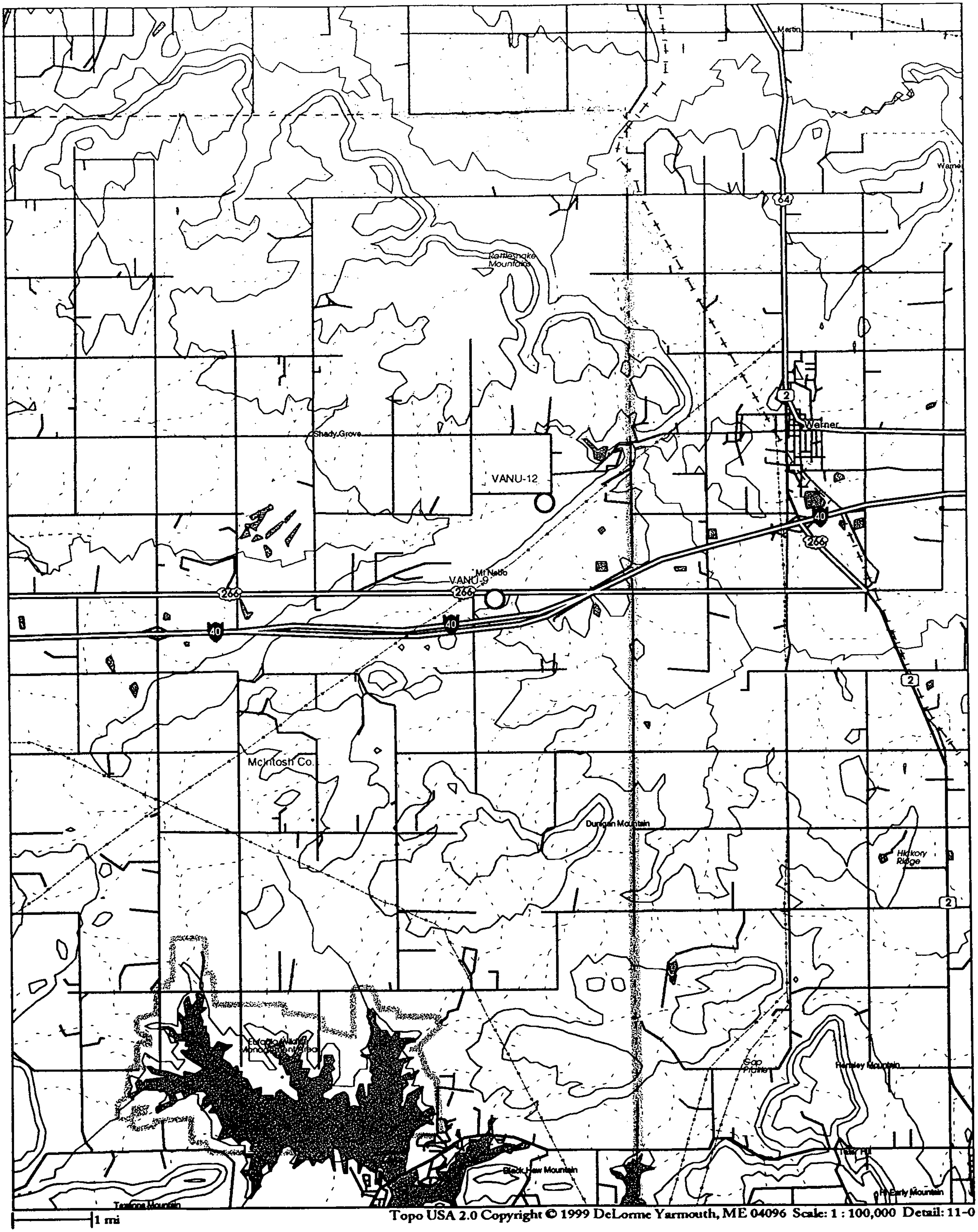
Surveyor: Paul Kores and Heather Oakley. May 19, 1999. Voucher specimen deposited at OKL.

Location: McIntosh County, Oklahoma. 1.9 miles east of Shady Grove Road on East 1057. T 12 N R 18 E, Section 26, Warner quadrangle.

Population size and vigor: About 3,000 individuals extending 100 m of both sides of road and into 2 adjacent hay meadows.

Habitat and description: Roadside and adjacent hay meadows. Sandy, clay substrate; open light. Population stops at mowed hay meadow as well as overgrown area of roadside. *V. radiata* also present.

Threats: Possible premature mowing, invasion of shrubs and tall grasses, and overgrazing in hay meadow.



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Site name: VANU-13

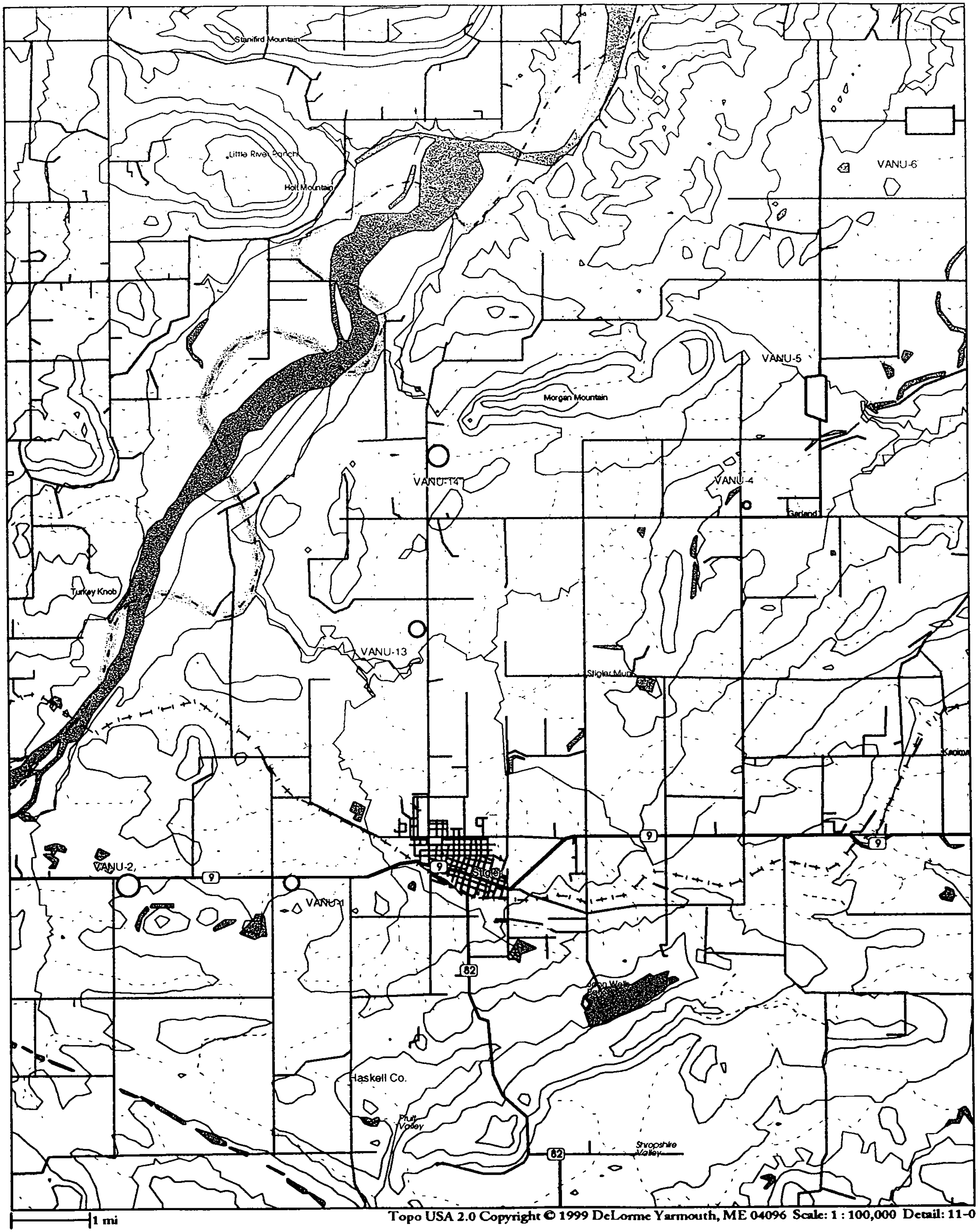
Surveyor: Heather Oakley. May 27, 1999. Voucher specimen deposited at OKL.

Location: Haskell County, Oklahoma. Perry Road, 2.5 miles north of Stigler. T 10 N R 20 E, Section 36, Stigler West quadrangle.

Population size and vigor: About 76 individuals on west side of road, extending about 100 yd.

Habitat and description: Roadside ditch, clay substrate, open light. *V. nuttallii* occurs only in area that was mowed earlier in the year, adjacent to road. Unmowed area on other side of ditch has very tall grass, and *V. nuttallii* is not found here. *V. radiata* also present.

Threats: Premature mowing and invasion of tall vegetation and shrubs .



Stanifird Mountain
Little River Ranch
Holt Mountain
VANU-6
VANU-5
Morgan Mountain
VANU-14
VANU-4
Garland
Turkey Knob
VANU-13
Stigler Muni
9
VANU-2
VANU-1
Stigler
82
Haskell Co.
Pruitt Valley
Shropshire Valley
1 mi
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 100,000 Detail: 11-0

Site Name: VANU-14

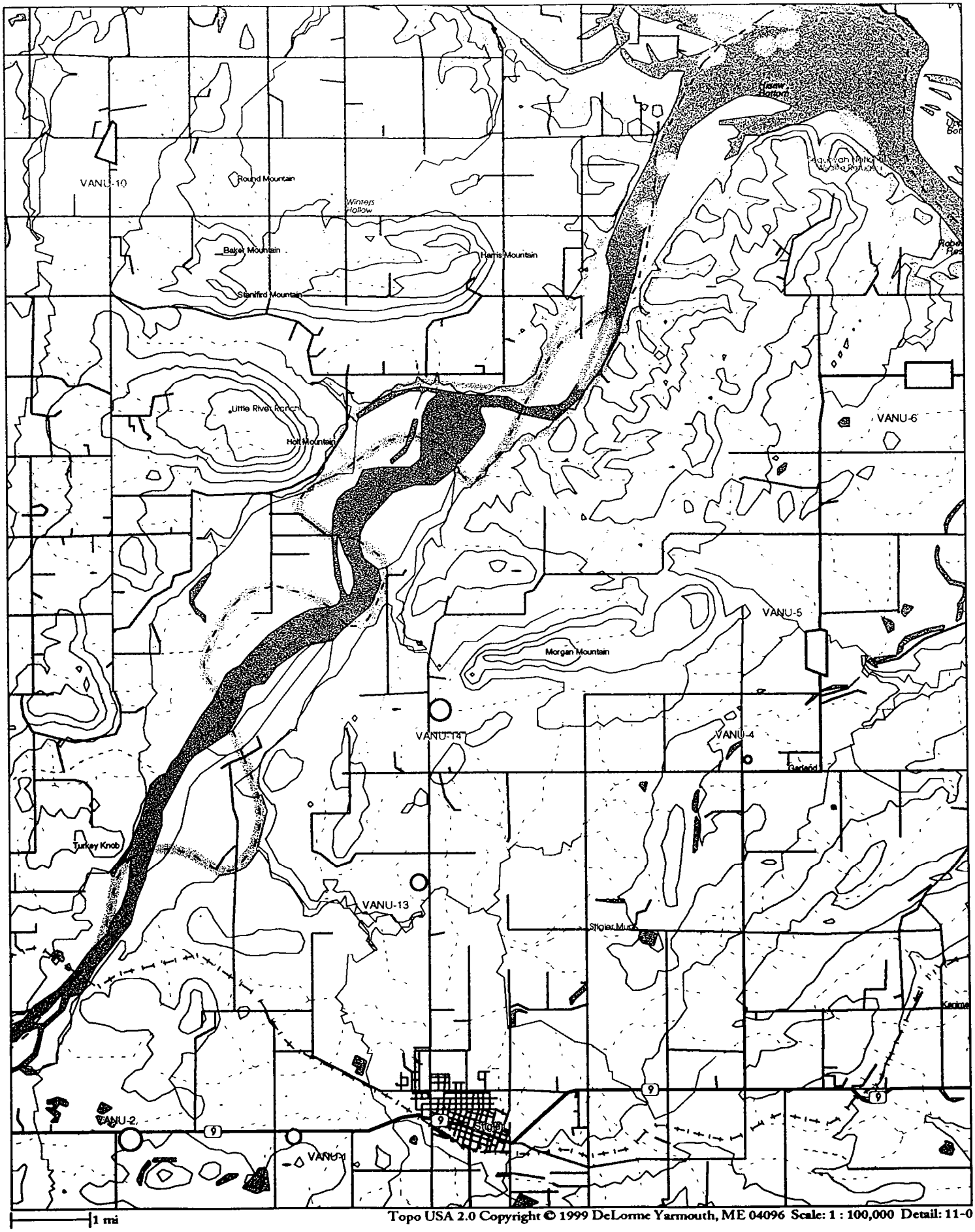
Surveyor: Heather Oakley. May 27, 1999. Voucher specimen deposited at OKL

Location: Haskell County, Oklahoma. Perry Road, 5 miles north of Stigler. T 10 N R 21 E, Section 19, Stigler West quadrangle.

Population size and vigor: Feeble population of about 42 individuals on east side of road only, extending about 30 yd.

Habitat and description: Roadside ditch with rocky stream on edge of woods. Clay/limestone substrate, partial light. Area adjacent to road (about 2 feet) mowed. Plants located on the edge of mowed area and in unmowed area, only where tall grass is absent. *V. radiata* also present.

Threats: Premature mowing and invasion of tall vegetation and shrubs.


VANU-10
Round Mountain
Winters Hollow
Baker Mountain
Harris Mountain
Stanifird Mountain
Little River Ranch
Hot Mountain
VANU-6
VANU-5
Morgan Mountain
VANU-14
VANU-4
Garfield
Turkey Knob
VANU-13
Stigler Muni
VANU-2
VANU-1
9
1 mi
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 100,000 Detail: 11-0

Site Name: VANU-15

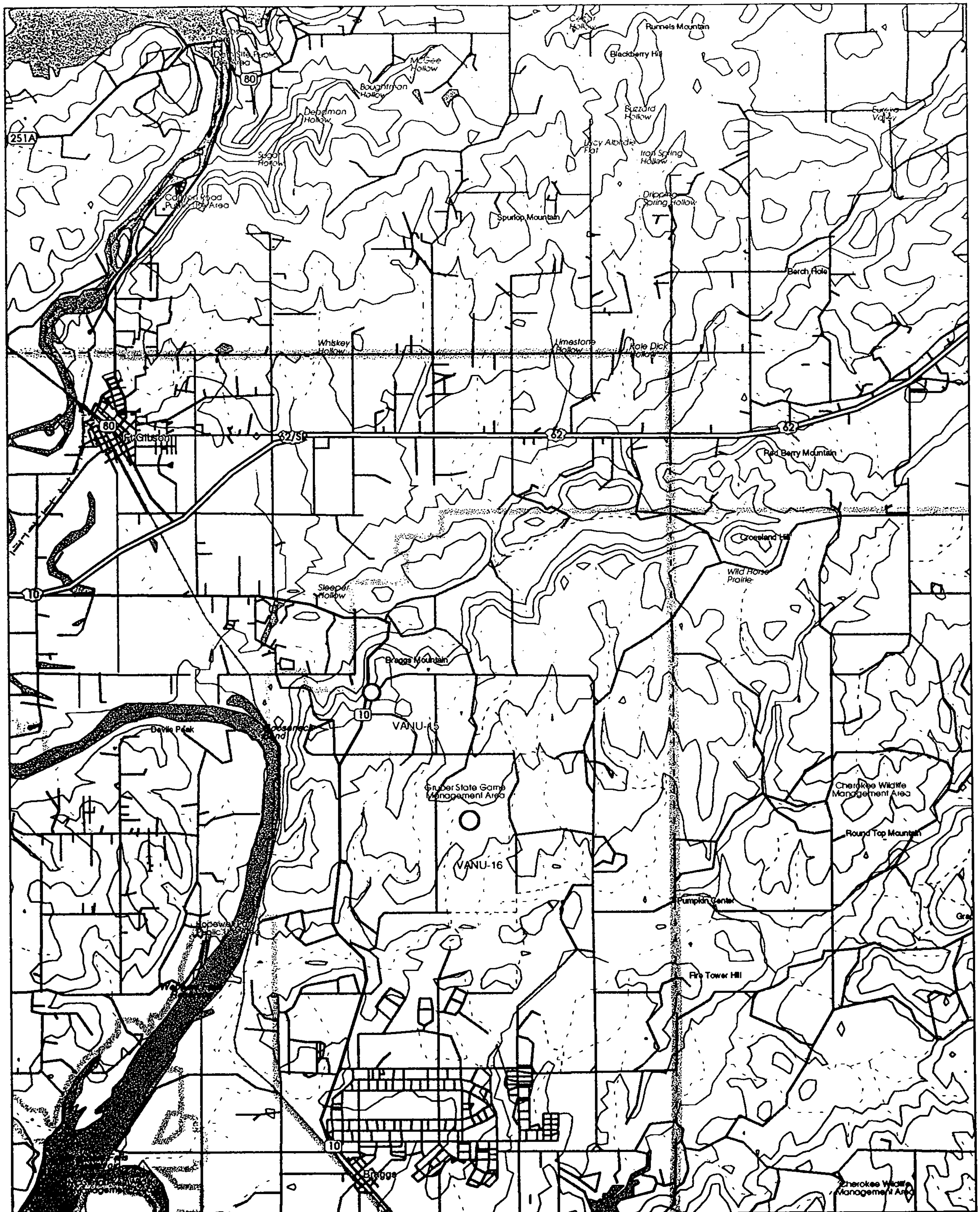
Surveyor: Heather Oakley. June 3, 1999. Voucher specimen deposited at OKL

Location: Muskogee County, Oklahoma. Highway 10, 6 miles north of Braggs. T 15 N R 20 E, Section 28, Fort Gibson Dam quadrangle.

Population size and vigor: Feeble population of about 20 individuals, east side of road only, extending about 50 yd.

Habitat and description: Roadside ditch with rocky, flowing stream adjacent to hay meadow. Area adjacent to road mowed (about 10 yd.). Saturated clay/limestone substrate, open light. Plants located adjacent to stream. Growing with *V. radiata* as well as *V. longiflora*, and both are much more abundant than *V. nuttallii*.

Threats: Premature mowing and invasion of tall vegetation and shrubs.


Runnels Mountain
Blackberry Hill
McGee Hollow
Boughtman Hollow
Buzzard Hollow
Iron Spring Hollow
Sugar Hollow
Spurlop Mountain
Whiskey Hollow
Limestone Hollow
Red Berry Mountain
Crossland Hill
Wild Horse Prairie
Sleeper Hollow
Braggs Mountain
VANU-15
Devils Peak
Gruber State Game Management Area
VANU-16
Cherokee Wildlife Management Area
Round Top Mountain
Pumpkin Center
Fire Tower Hill
Braggs
251A
80
62
10
1 mi

Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 100,000 Detail: 11-0

Site Name: VANU-16

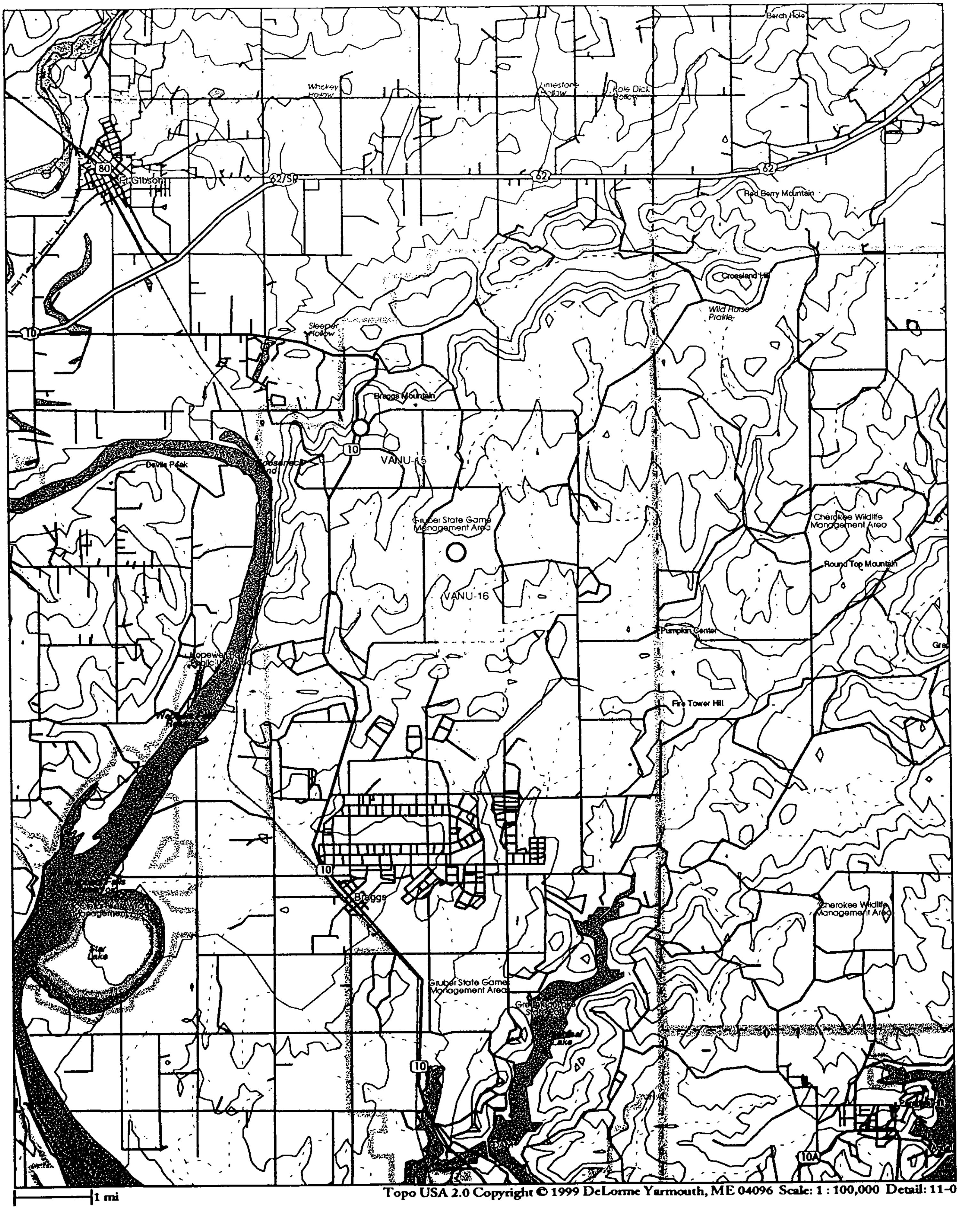
Surveyor: Heather Oakley. June 17, 1999. Voucher specimen deposited at OKL

Location: Muskogee County, Oklahoma. Camp Gruber, Plot #508, Training Area 402, off of Platoon Assault Course Road. T 15 N R 20 E, Section 34, Braggs quadrangle.

Population size and vigor: About 200 plants in 25m x 100m disturbance area in oak forest.

Habitat and description: Disturbance in oak forest, about 25m x 100m. Silty loam substrate, open light. Growing with *V. longiflora*.

Threats: Overgrazing (deer and elk only), possible burning, as well as military use for bivouacking.


Berch Hole
Limestone Hollow
Red Berry Mountain
62
62/SR
80
Ft. Gibson
10
Sleeper Hollow
Crossland Hill
Wild Horse Prairie
Braggs Mountain
VANU-15
Devils Peak
Gruber State Game Management Area
VANU-16
Cherokee Wildlife Management Area
Round Top Mountain
Pumpkin Center
Fire Tower Hill
Braggs
Star Lake
Cherokee Wildlife Management Area
Gruber State Game Management Area
10A

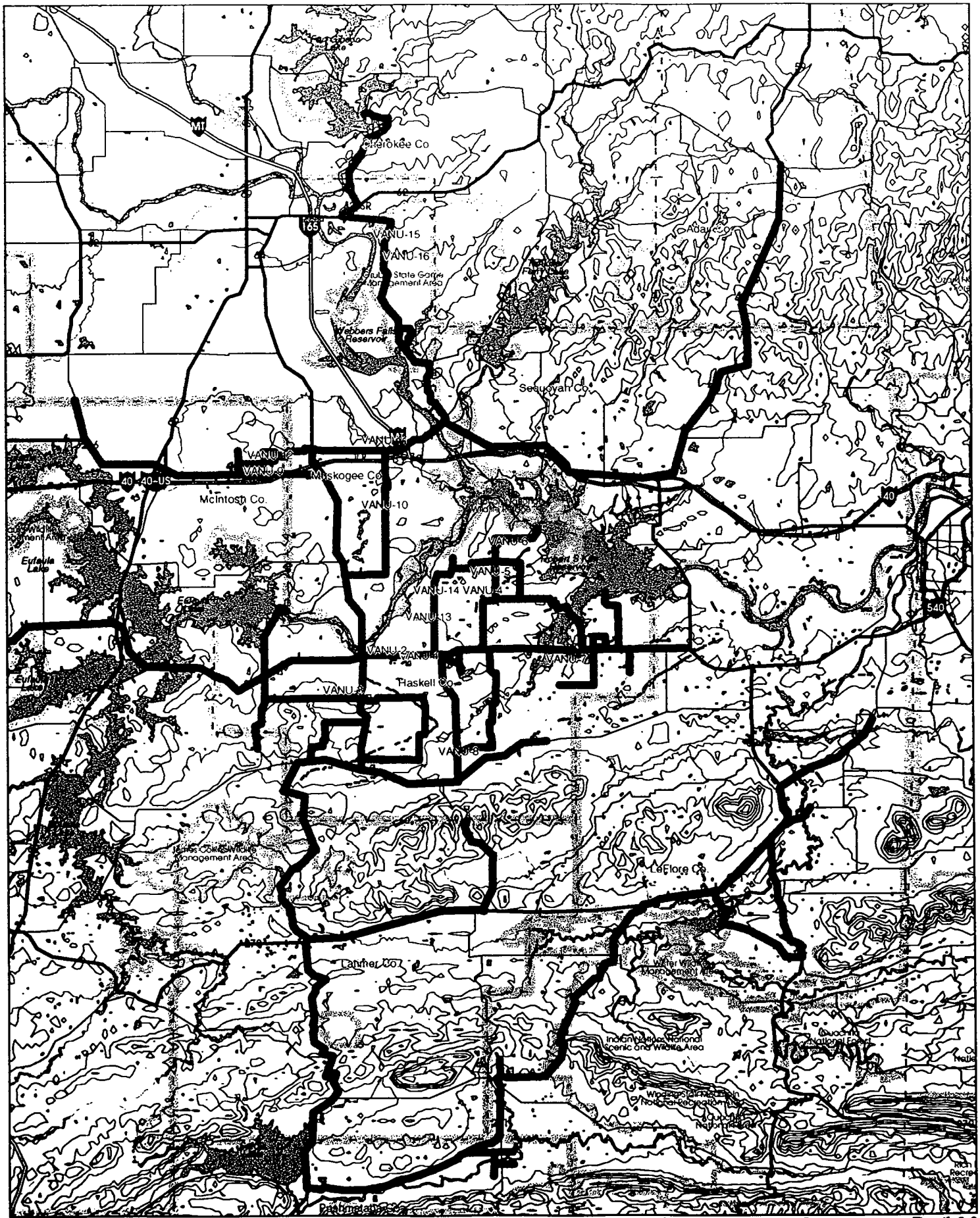
1 mi

 Scale: 1 : 100,000 Detail: 11-0

6. Total Area Surveyed in Oklahoma

Roadsides marked in blue surveyed for *V. nuttallii*

Extant population marked in orange


Cherokee Co
VANU-15
VANU-16
Webbers Falls Reservoir
Sequoyah Co
VANU-11
VANU-12
VANU-9
Muskogee Co
40
40-US
McIntosh Co.
VANU-10
VANU-6
VANU-5
VANU-14
VANU-4
VANU-13
VANU-2
VANU-3
VANU-1
Haskell Co
VANU-8
VANU-7
LeFlore Co
Latimer Co
Indian Nations National Scenic and Wildlife Area
Ouachita National Forest
10 mi
Topo USA 2.0 Copyright © 1999 DeLorme Yarmouth, ME 04096 Scale: 1 : 650,000 Detail: 8-3

7. Original Field Forms

Sec. 14 T 9N - R 19E

VANU-1

5/12/99

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

about 2.5 miles east of Whitefield.

Site Name: Highway 9 near Jackson range (N. ditch) Date: May 12, 1999 Source Code: ______
Quad Name(s): Stigler West Quad Code(s): 3509532
State: (OK) County(ies): Haskell Co Field Quad Margin #: ______
Full extent of EO known and mapped? ____yes ____no
Precise locations of individuals or groups mapped on base map? ____yes ____no

BIOLOGY

Valerianella nuttallii

Element Name:
Element Code: ______ Occurrence #: ______

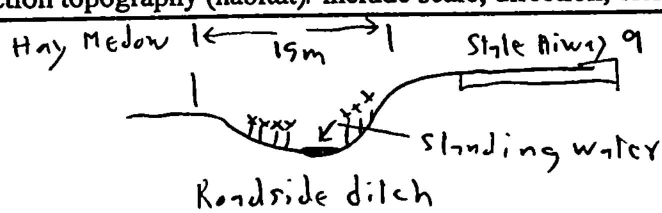
Phenology	Pop Size: Ramets		Genets	Pop Area	Age Structure	Vigor
__in leaf	__	1-10	__	__1yd²	__% Seedlings	__Very Feeble
__in bud	__	11-50	__	__1-5yd²	__% Immature	__Feeble
✓in flower	__	51-100	__	__5-10yd²	100 % 1st Year	__Normal
✓Immature fruit	__	101-1000	__	__10-100yd²	__% Mature (established)	✓Vigorous
__Mature fruit	✓	1001-10,000	__	✓100yd² -2ac	__%Senescent	__Exceptionally Vigorous
__Seed dispersing	__	10K+	__	__2ac+	__ Unknown	
__Dormant	__	actual # 1385 (If known)				

Comments on above: two large populations approximately 150 m apart, habitat appears continuous
Evidence of reproduction ✓ yes ____no Explain: numerous ovaries with seeds
Type of reproduction: ✓ sexual ______asexual ______both
Evidence of symbiotic or parasitic relationship: ____yes ✓no Explain: ______
Evidence of disease, predation, etc. ____yes ✓ no Explain: ______

HABITAT

Aspect	Slope	Light	Topographic	Moisture
__N __NE	__Flat	✓Open	__Crest	__Inundated (Hydric)
__E __NW	__0-10	__Partial	__Upper Slope	__Intermittently flooded
__S __SE	__10-35	__Filtered	__Mid-Slope	✓Saturated (Wet-mesic)
__W __SW	__35+	__Shade	__Lower-Slope	__Moist (Mesic)
	__Vertical		✓Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation: ______ ft to ______ ft
Cross section topography (habitat)/ include scale, direction, element position



Sympatric with
Valerianella nuttallii
Indian Paint Brush
Red Clover
Yellow Clover
Fleabane
Purple Vetch
Ven... ...

Oxalis
Geranium
sedges
Ironweed
Ranunculus
Juncus
Galium

HABITAT (continued)

ssociated natural community/plant community: typical roadside species
atural community form completed? _____ yes _____ no
ssociated plant species: See bottom previous page

ubstrate: Clay

IDENTIFICATION

hotograph taken? ✓ yes _____ no
pecimen taken? ✓ yes _____ no If yes, give collection # and repository: _____

o other members of this genus co-occur at this site? ✓ yes _____ no If yes, complete below:
List: Valerianella radiata
Hybridization? _____ yes ✓ no
Identification problems? _____ yes ✓ no Explain: _____

CONSERVATION

wner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ✓ unknown
vidence of disturbance: annual mowing
ventory needs: _____
ata security? _____ yes _____ no Explain: _____

SUMMARY

O Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent B-Good C-Marginal D-Poor
Comments: _____

O Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent (B) Good C-Marginal D-Poor
Comments: _____

O Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent (B) Good C-Marginal D-Poor
Comments: _____

O Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent B-Good C-Marginal D-Poor
Comments: _____

O Rank: (ie, a summary of all factors listed above)
A B C D
Comments: _____

Species probably sets seed before annual roadside mowing

Sc 16 T 9N - R20E

VANU - 2

5/12/99

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

Site Name: Highway 9, S. side ditch 3.75 m W of Stighler Date: May 12, 1999 Source Code:______

Quad Name(s): Stigler West Quad Code(s): 35095 32

State: OK County(ies): Haskell Co Field Quad Margin #:______

Full extent of EO known and mapped? _____yes _____no

Precise locations of individuals or groups mapped on base map? _____yes _____no

BIOLOGY

Element Name: Valerianella nuttallii

Element Code:______ Occurrence #:______

Phenology	Pop Size Ramets	Pop Size	Pop Size Genets	Pop Area	Age Structure	Vigor
__in leaf	__	1-10	__	__1yd²	__% Seedlings	__Very Feeble
__in bud	__	11-50	__	__1-5yd²	__% Immature	__Feeble
✓in flower	__	51-100	__	__5-10yd²	100 % 1st Year	__Normal
✓Immature fruit	__	101-1000	__	__10-100yd²	__% Mature (established)	✓Vigorous
__Mature fruit	✓	1001-10,000	__	✓100yd² -2ac	__%Senescent	__Exceptionally Vigorous
__Seed dispersing	__	10K+	__	__2ac+	__ Unknown	
__Dormant	____	actual # (If known)	____			

Comments on above: 3 moderately large populations about 25 m apart

Evidence of reproduction ✓ yes ___no Explain:______

Type of reproduction: ✓ sexual ______asexual _____both

Evidence of symbiotic or parasitic relationship: ___yes ✓no Explain:______

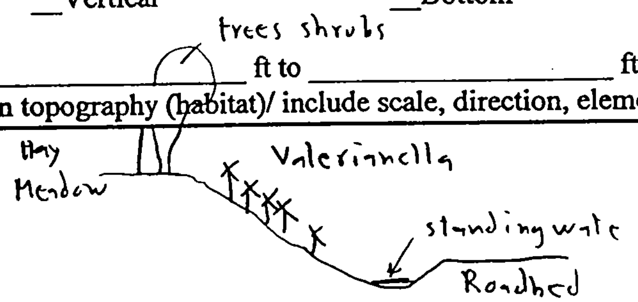
Evidence of disease, predation, etc. ___yes ✓no Explain:______

HABITAT

Aspect	Slope	Light	Topographic	Moisture
__N __NE	__Flat	✓Open	__Crest	__Inundated (Hydric)
__E __NW	✓0-10	__Partial	__Upper Slope	__Intermittently flooded
✓S __SE	__10-35	__Filtered	✓Mid-Slope	__Saturated (Wet-mesic)
__W __SW	__35+	__Shade	__Lower-Slope	✓Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation:______ ft to ______ ft

Cross section topography (habitat)/ include scale, direction, element position



HABITAT (continued)

ssociated natural community/plant community: typical roadside species
atural community form completed? _____ yes _____ no
ssociated plant species: Delphinium, Vetch, Amorpha, V. radiata, Coreopsis, Geranium, Linum, Yellow Clover, Plantago
ubstrate: clay / gravel / fill

IDENTIFICATION

notograph taken? ✓ yes _____ no
pecimen taken? ✓ yes _____ no If yes, give collection # and repository: _____
o other members of this genus co-occur at this site? ✓ yes _____ no If yes, complete below:
List: V. radiata .
Hybridization? _____ yes ✓ no
Identification problems? _____ yes ✓ no Explain: _____

CONSERVATION

wner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ✓ unknown
vidence of disturbance: annual mowing
ventory needs: _____
ata security? _____ yes _____ no Explain: _____

SUMMARY

Q Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

Q Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

Q Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent B-Good C-Marginal D-Poor
Comments: _____

Q Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent B-Good C-Marginal D-Poor
Comments: _____

Q Rank: (ie, a summary of all factors listed above)
A B C D
Comments: _____

Sec. 36 T3N-R19E VANU-3

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM
(between Rt. 2 & Hughart)

5/12/99

Site Name: 5 miles in on N side Beaver Mt. Road Date: May 12, 1999 Source Code: _____
Quad Name(s): Sans Bois Quad Code(s): 3509522
State: OK County(ies): Haskell Co. Field Quad Margin #: _____
Full extent of EO known and mapped? _____yes _____no
Precise locations of individuals or groups mapped on base map? _____yes _____ no

BIOLOGY

Valerianella nuttallii

Element Name:
Element Code: _____ Occurrence #: _____

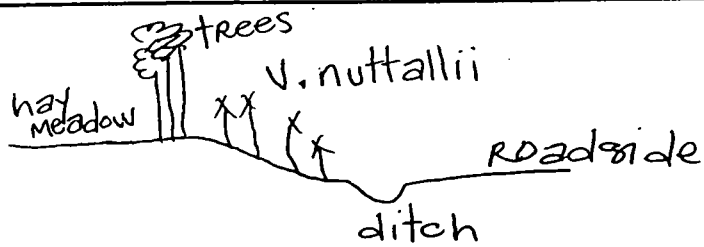
Phenology	Pop Size Ramets	Pop Size Genets	Pop Area	Age Structure	Vigor
__in leaf	__ 1-10	__	__1yd²	__% Seedlings	__Very Feeble
__in bud	__ 11-50	__	__1-5yd²	__% Immature	__Feeble
✓in flower	__ 51-100	__	__5-10yd²	__% 1st Year	__Normal
✓Immature fruit	__ 101-1000	__	__10-100yd²	100 % Mature (established)	✓Vigorous
__Mature fruit	✓1001-10,000	__	✓100yd² -2ac	__%Senescent	__Exceptionally Vigorous
__Seed dispersing	__ 10K+	__	__2ac+	__ Unknown	
__Dormant	____actual #____ (If known)				

Comments on above: continuous habitat for 165 m.
Evidence of reproduction ✓yes ____no Explain: _____
Type of reproduction: ____✓ sexual _____asexual _____both
Evidence of symbiotic or parasitic relationship: ___yes ✓no Explain: _____
Evidence of disease, predation, etc. ___yes ✓no Explain: _____

HABITAT

Aspect	Slope	Light	Topographic	Moisture
__N __NE	__Flat	✓Open	✓Crest	__Inundated (Hydric)
__E __NW	✓0-10	✓Partial	✓Upper Slope	__Intermittently flooded
__S __SE	__10-35	__Filtered	✓Mid-Slope	__Saturated (Wet-mesic)
__W __SW	__35+	__Shade	✓Lower-Slope	✓Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation: _____ ft to _____ ft
Cross section topography (habitat)/ include scale, direction, element position



HABITAT (continued)

ssociated natural community/plant community: Roadside
atural community form completed? _____ yes _____ no
ssociated plant species: Coreopsis grandiflora, Amorpha canescens, yellow clover, Rumex, Penstemon, Galium, Monarda, purple vetch, Delphenium, Rubus, Bromus.
ıbstrate: clay

IDENTIFICATION

ıotograph taken? ✓ yes _____ no
ɔecimen taken? ✓ yes _____ no If yes, give collection # and repository: _____

o other members of this genus co-occur at this site? ✓ yes _____ no If yes, complete below:
List: V. radiata
Hybridization? _____ yes ✓ no
Identification problems? _____ yes ✓ no Explain: _____

CONSERVATION

wner aware of EO? _____ yes _____ no ✓ unknown Owner protecting EO? _____ yes _____ no ✓ unknown
ʌidence of disturbance: annual mowing
ventory needs: _____
ata security? _____ yes _____ no Explain: _____

SUMMARY

ɔ Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent (B) Good C-Marginal D-Poor
Comments: _____

ɔ Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent (B) Good C-Marginal D-Poor
Comments: _____

ɔ Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent B-Good C-Marginal D-Poor
Comments: _____

ɔ Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent B-Good C-Marginal D-Poor
Comments: _____

ɔ Rank: (ie, a summary of all factors listed above)
A B C D
Comments: _____

Sec. 23 T 10N - R 21 E

5/17/99
VANU-4

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

Site Name: County Trunk 8, 4.2 miles N of Highway 1 Date: May 17, 1999 Source Code: _____
Quad Name(s): Stigler East Quad Code(s): 3509531
State: (OK) County(ies): Haskell Co Field Quad Margin #: _____
Full extent of EO known and mapped? _____yes _____no
Precise locations of individuals or groups mapped on base map? _____yes _____ no

BIOLOGY

Valerianella nuttallii

Element Name:
Element Code: _____ Occurrence #: _____

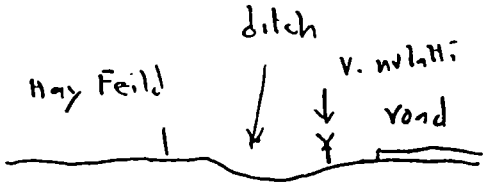
Phenology	Pop Size Ramets	Pop Size Genets	Pop Area	Age Structure	Vigor
__in leaf	✓ 1-10	__	✓ 1yd²	__% Seedlings	__Very Feeble
__in bud	__ 11-50	__	__1-5yd²	__% Immature	__Feeble
✓ in flower	__ 51-100	__	__5-10yd²	__% 1st Year	__Normal
__Immature fruit	__ 101-1000	__	__10-100yd²	✓ % Mature	__Vigorous
__Mature fruit	__1001-10,000	__	__100yd² -2ac	(established)	__Exceptionally
__Seed dispersing	__ 10K+	__	__2ac+	__%Senescent	Vigorous
__Dormant	____actual #____ (If known)			__ Unknown	

Comments on above: Single mature plant only
Evidence of reproduction ✓ yes ____no Explain: _____
Type of reproduction: ✓ sexual _____asexual _____both
Evidence of symbiotic or parasitic relationship: ___yes ✓ no Explain: _____
Evidence of disease, predation, etc. ___yes ✓ no Explain: _____

HABITAT

Aspect	Slope	Light	Topographic	Moisture
__N __NE	✓ Flat	✓ Open	__Crest	__Inundated (Hydric)
__E __NW	__0-10	__Partial	__Upper Slope	__Intermittently flooded
__S __SE	__10-35	__Filtered	__Mid-Slope	__Saturated (Wet-mesic)
__W __SW	__35+	__Shade	__Lower-Slope	✓ Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation: _____ ft to _____ ft
Cross section topography (habitat)/ include scale, direction, element position



with V. radiata
Allium
Ranunculus

HABITAT (continued)

ssociated natural community/plant community: roadside
atural community form completed? _____ yes _____ no
ssociated plant species: Allium, Yellow Clover, Val. Radiata

ıbstrate: clay

IDENTIFICATION

ıotograph taken? _____yes ✓ no
ɔecimen taken? _____yes ✓ no If yes, give collection # and repository: _____

o other members of this genus co-occur at this site? ✓ yes _____no If yes, complete below:
List: Val radiata
Hybridization? _____yes _____no
Identification problems? _____yes _____no Explain: _____

CONSERVATION

wner aware of EO? ____yes ____no ✓ unknown Owner protecting EO? ____yes ____no ✓ unknown
vidence of disturbance: annual mowing
ventory needs: _____
ata security? _____yes _____no Explain: _____

SUMMARY

Q Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent B-Good C-Marginal (D)-Poor
Comments: _____

Q Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent B-Good C-Marginal (D)-Poor
Comments: _____

Q Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

Q Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

Q Rank: (ie, a summary of all factors listed above)
A B C (D)
Comments: _____

only 1 plant observed

sec. 13 T 11N R 21E

5/17/99
VANU-5

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM
(N.W. of Stigler)

Site Name: County truck D, to 2 Miles N. of Highway 9 Date: May 17, 1999 Source Code: _____
Quad Name(s): Stigler East. Quad Code(s): _____ 3509531
State: OK County(ies): Haskell Co. Field Quad Margin #: _____
Full extent of EO known and mapped? _____yes _____no
Precise locations of individuals or groups mapped on base map? _____yes _____ no

BIOLOGY

Valerianella nuttallii

Element Name:
Element Code: _____ Occurrence #: _____

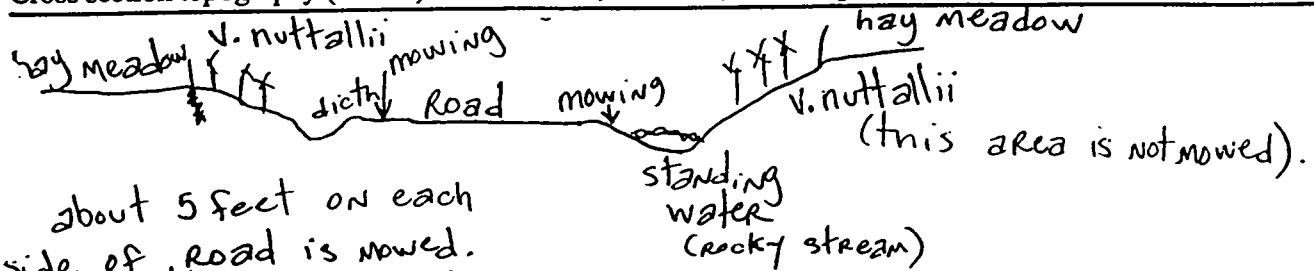
Phenology	Pop Size Ramets	Pop Size Genets	Pop Area	Age Structure	Vigor
_in leaf	__ 1-10	__	__1yd²	__% Seedlings	__Very Feeble
_in bud	__ 11-50	__	__1-5yd²	__% Immature	__Feeble
✓in flower	__ 51-100	__	__5-10yd²	__% 1st Year	✓Normal
✓Immature fruit	__ 101-1000	__	__10-100yd²	100 % Mature (established)	__Vigorous
✓Mature fruit	✓1001-10,000	__	✓100yd² -2ac	__%Senescent	__Exceptionally Vigorous
✓Seed dispersing	__ 10K+	__	__2ac+	__ Unknown	
_Dormant	____actual #____ (If known)				

Comments on above: population extending .5 miles, both sides of road and near fence in hay meado
Evidence of reproduction ✓yes ____no Explain: _____
Type of reproduction: ✓ sexual _____asexual _____both
Evidence of symbiotic or parasitic relationship: ___yes ✓no Explain: _____
Evidence of disease, predation, etc. ___yes ✓no Explain: _____

HABITAT

Aspect	Slope	Light	Topographic	Moisture
__N __NE	__Flat	✓Open	__Crest	__Inundated (Hydric)
__E __NW	✓0-10	__Partial	✓Upper Slope	__Intermittently flooded
__S __SE	__10-35	__Filtered	✓Mid-Slope	__Saturated (Wet-mesic)
__W __SW	__35+	__Shade	✓Lower-Slope	✓Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation: _____ ft to _____ ft
Cross section topography (habitat)/ include scale, direction, element position



about 5 feet on each side of road is mowed. No V. nuttallii is found here.

HABITAT (continued)

ssociated natural community/plant community: roadside
ıtural community form completed? _____ yes _____ no
ssociated plant species: White clover, yellow clover, Acleia Multiflora, Delphinum, Indian paintbrush, curly doc, Coreopsis, allium, V. radiata
bstrate: clay over limestone

IDENTIFICATION

ıotograph taken? _____ yes ✓ no
ecimen taken? ✓ yes _____ no If yes, give collection # and repository: _____

other members of this genus co-occur at this site? ✓ yes _____ no If yes, complete below:
List: V. radiata
Hybridization? _____ yes ✓ no
Identification problems? _____ yes ✓ no Explain: _____

CONSERVATION

vner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ✓ unknown
idence of disturbance: site is mowed near the road, possibility of mowing.
ventory needs: _____
ta security? _____ yes _____ no Explain: _____

SUMMARY

) Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

) Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

) Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

) Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

) Rank: (ie, a summary of all factors listed above)
A (B) C D
Comments: _____

Sec. 30 11N-21E Sec. 31 11N-21E

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM
(Nw. of Stigler)

5/17/
VANU-6

Site Name: County Rd, 11.5 miles N of H.9 Date: May 17, 1999 Source Code: _____
Quad Name(s): Stigler NE Quad Code(s): 3509591
State: OK County(ies): Haskell Co. Field Quad Margin #: _____
Full extent of EO known and mapped? _____yes _____no
Precise locations of individuals or groups mapped on base map? _____yes _____no

BIOLOGY

Valerianella nuttallii

Element Name:
Element Code: _____ Occurrence #: _____

Phenology	Pop Size Ramets	Pop Size Genets	Pop Area	Age Structure	Vigor
_in leaf	__ 1-10	__	__1yd²	__% Seedlings	__Very Feeble
_in bud	__ 11-50	__	__1-5yd²	__% Immature	__Feeble
✓in flower	__ 51-100	__	__5-10yd²	100% 1st Year	✓Normal
✓Immature fruit	__ 101-1000	__	__10-100yd²	__% Mature	__Vigorous
_Mature fruit	✓1001-10,000	__	__100yd² -2ac	(established)	__Exceptionally
_Seed dispersing	__ 10K+	__	__2ac+	__%Senescent	Vigorous
_Dormant	____actual #____ (If known)			__ Unknown	

site possibly burned previously, evidence of fire killed shrubs

Comments on above: site with shallow limestone covered by gravel & clay, probably not mowed
Evidence of reproduction ✓ yes ____no Explain: _____
Type of reproduction: ____✓____sexual _____asexual _____both
Evidence of symbiotic or parasitic relationship: ___yes ✓no Explain: _____
Evidence of disease, predation, etc. ___yes ✓no Explain: _____

HABITAT

Aspect	Slope	Light	Topographic	Moisture
__N __NE	__Flat	✓Open	✓Crest	__Inundated (Hydric)
__E __NW	✓0-10	__Partial	✓Upper Slope	__Intermittently flooded
__S __SE	__10-35	__Filtered	✓Mid-Slope	__Saturated (Wet-mesic)
__W __SW	__35+	__Shade	✓Lower-Slope	✓Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation: _____ ft to _____ ft
Cross section topography (habitat)/ include scale, direction, element position

found on both sides of road

sympatric with:
Allium
Delphinium
Yellow clover
Coreopsis grandiflora
Indian Paint Brush

HABITAT (continued)

ssociated natural community/plant community: Road side
atural community form completed? _____ yes _____ no
ssociated plant species: Allium, Delphinium see bottom previous page

ıbstrate: gravel and clay over limestone, soil shallow

IDENTIFICATION

ıotograph taken? ____ yes ✓ no
ɔecimen taken? ✓ yes ____ no If yes, give collection # and repository: _____

o other members of this genus co-occur at this site? ✓ yes ____ no If yes, complete below:
List: V. radiata
Hybridization? ____ yes ✓ no
Identification problems? ____ yes ✓ no Explain: _____

CONSERVATION

wner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ✓ unknown
ıidence of disturbance: P
ventory needs: _____
ata security? ____ yes ____ no Explain: _____

SUMMARY

ɔ Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
(A)-Excellent (B) Good C-Marginal D-Poor
Comments: _____

ɔ Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
(A) Excellent (B) Good C-Marginal D-Poor
Comments: _____

ɔ Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
(A) Excellent B-Good C-Marginal D-Poor
Comments: _____

ɔ Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
(A) Excellent B-Good C-Marginal D-Poor
Comments: _____

ɔ Rank: (ie, a summary of all factors listed above)
(A) B C D
Comments: _____

c. 22, 23, 26, 27, 34 T9N-R22E
c. 35, 2, 1, 10, 11, 15 T8N-R22E

5/17/99
VANU-7

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

Site Name: 1.5 miles south of Highway 9 on highway 26. Date: May 17, 1999 Source Code: _____
Quad Name(s): McCurtain Quad Code(s): 3509428
State: OK County(ies): Haskell Co. Field Quad Margin #: _____
Full extent of EO known and mapped? _____yes _____no
Precise locations of individuals or groups mapped on base map? _____yes _____ no

BIOLOGY

Valerianella nuttallii

Element Name:
Element Code: _____ Occurrence #: _____

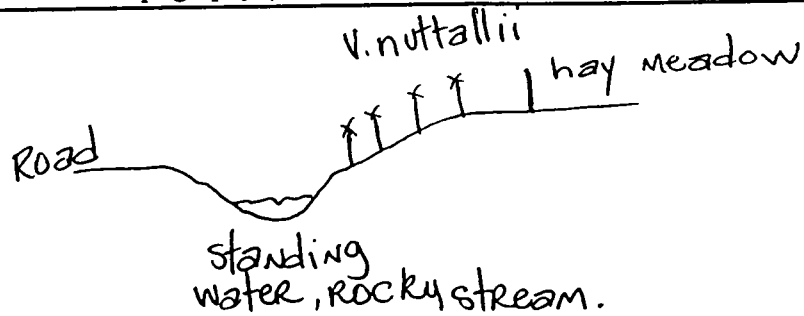
Phenology	Pop Size Ramets	Pop Size Genets	Pop Area	Age Structure	Vigor
__in leaf	__ 1-10	__	__1yd²	__% Seedlings	__Very Feeble
__in bud	__ 11-50	__	__1-5yd²	__% Immature	__Feeble
✓in flower	__ 51-100	__	__5-10yd²	__% 1st Year	__Normal
✓Immature fruit	__ 101-1000	__	__10-100yd²	100% Mature	✓Vigorous
✓Mature fruit	✓1001-10,000	__	✓100yd² -2ac	(established)	__Exceptionally
✓Seed dispersing	✓ 10K+	__	__2ac+	__%Senescent	Vigorous
__Dormant	____actual #____ (If known)			__ Unknown	

Comments on above: along Roadside extending entire length of Highway 26 to highway 31 both sides of Road
Evidence of reproduction ✓yes ____no Explain: _____
Type of reproduction: ____✓sexual _____asexual _____both
Evidence of symbiotic or parasitic relationship: ___yes ✓no Explain: _____
Evidence of disease, predation, etc. ___yes ✓no Explain: _____

HABITAT

Aspect	Slope	Light	Topographic	Moisture
__N __NE	__Flat	✓Open	✓Crest	__Inundated (Hydric)
__E __NW	✓0-10	__Partial	✓Upper Slope	__Intermittently flooded
__S __SE	__10-35	__Filtered	✓Mid-Slope	__Saturated (Wet-mesic)
__W __SW	__35+	__Shade	✓Lower-Slope	✓Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation: _____ ft to _____ ft
Cross section topography (habitat)/ include scale, direction, element position



HABITAT (continued)

ssociated natural community/plant community: Roadside
atural community form completed? _____ yes _____ no
ssociated plant species: fleabane, delphinum, Indian Paintbrush, Coreopsis, Acleia multiflora, V. radiata, Yellow clover.
ıbstrate: clay over Rocky limestone

IDENTIFICATION

ıotograph taken? ____yes ✓no
ecimen taken? ✓yes ____no If yes, give collection # and repository: _____

o other members of this genus co-occur at this site? ✓yes ____no If yes, complete below:
List: V. radiata
Hybridization? ____yes ✓no
Identification problems? ____yes ✓no Explain: _____

CONSERVATION

wner aware of EO? ____yes ____no ✓unknown Owner protecting EO? ____yes ____no ✓unknown
ıidence of disturbance: _____
ventory needs: _____
ıta security? ____yes ____no Explain: _____

SUMMARY

) Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
(A)-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

) Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
(A)-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

) Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
(A)-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

) Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
(A)-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

) Rank: (ie, a summary of all factors listed above)
(A) (B) C D
Comments: _____

ec. 33 TON-K'LIE

5/17/99
VANU-8

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

Site Name: 1 mile N. of Junction 82 & 31 Date: 17 May 1999 Source Code: _____
Quad Name(s): LeQuire Quad Code(s): 3509511
State: OK County(ies): Haskell Co. Field Quad Margin #: _____
Full extent of EO known and mapped? ____yes ____no
Precise locations of individuals or groups mapped on base map? ____yes ____no

BIOLOGY

Valerianella nuttallii

Element Name:
Element Code: _____ Occurrence #: _____

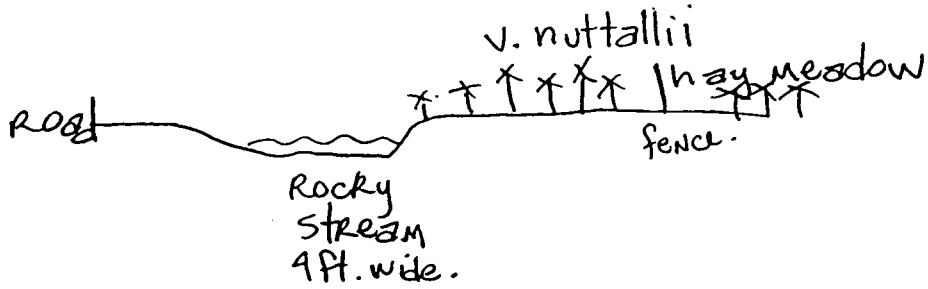
Phenology	Pop Size Ramets	Pop Size Genets	Pop Area	Age Structure	Vigor
__in leaf	__ 1-10	__	__1yd²	__% Seedlings	__Very Feeble
__in bud	__ 11-50	__	__1-5yd²	__% Immature	__Feeble
✓in flower	__ 51-100	__	__5-10yd²	__% 1st Year	✓Normal
✓Immature fruit	__ 101-1000	__	__10-100yd²	100% Mature	__Vigorous
__Mature fruit	✓1001-10,000	__	✓100yd² -2ac	(established)	__Exceptionally
✓Seed dispersing	__ 10K+	__	__2ac+	__%Senescent	Vigorous
__Dormant	____actual #____ (If known)		9/10 mile	__Unknown	

Comments on above: pop. 9/10 of mile long, both sides of road. ____
Evidence of reproduction ✓yes ____no Explain: _____
Type of reproduction: ____✓sexual _____asexual _____both
Evidence of symbiotic or parasitic relationship: ___yes ✓no Explain: _____
Evidence of disease, predation, etc. ___yes ✓no Explain: _____

HABITAT

Aspect	Slope	Light	Topographic	Moisture
__N __NE	__Flat	✓Open	✓Crest	__Inundated (Hydric)
__E __NW	✓0-10	__Partial	✓Upper Slope	__Intermittently flooded
__S __SE	__10-35	__Filtered	✓Mid-Slope	__Saturated (Wet-mesic)
__W __SW	__35+	__Shade	✓Lower-Slope	✓Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation: _____ ft to _____ ft
Cross section topography (habitat)/ include scale, direction, element position



HABITAT (continued)

ssociated natural community/plant community: roadside & adjacent hay meadows
atural community form completed? _____ yes _____ no
ssociated plant species: delphinum, blackberry, coreopsis, post oak, Indian paintbrush, fleabane, yellow clover, milkweed,

ıbstrate: clay over limestone

IDENTIFICATION

ıotograph taken? _____ yes ✓ no
ɔecimen taken? _____ yes _____ no If yes, give collection # and repository: _____

o other members of this genus co-occur at this site? _____ yes _____ no If yes, complete below:
List: _____
Hybridization? _____ yes _____ no
Identification problems? _____ yes _____ no Explain: _____

CONSERVATION

wner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ✓ unknown
ɾidence of disturbance: _____
ventory needs: _____
ata security? _____ yes _____ no Explain: _____

SUMMARY

) Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent (B) Good C-Marginal D-Poor
Comments: _____

) Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent (B) Good C-Marginal D-Poor
Comments: _____

) Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent (B) Good C-Marginal D-Poor
Comments: _____

) Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent (B) Good C-Marginal D-Poor
Comments: _____

) Rank: (ie, a summary of all factors listed above)
A (B) C D
Comments: _____
NO apparent mowing.

2C.2 11N-K10E 5/19/99

VANU-9.

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

Site Name: US Highway 266, 1.5 miles W. of Muskogee Co. Date: 19 May 1999 Source Code:____________
Quad Name(s): Warner Quad Code(s): 3509543
State: OK County(ies): McIntosh Co Field Quad Margin #:____________
Full extent of EO known and mapped? ____yes ____no
Precise locations of individuals or groups mapped on base map? ____yes ____no

BIOLOGY

Valerianella nuttallii

Element Name:
Element Code:____________ Occurrence #:________

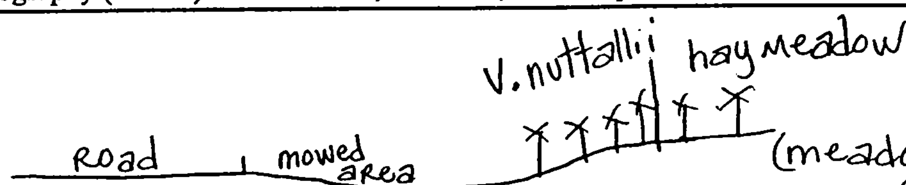
Phenology	Pop Size Ramets		Genets	Pop Area	Age Structure	Vigor
__in leaf	__	1-10	__	__1yd²	__% Seedlings	__Very Feeble
__in bud	__	11-50	__	__1-5yd²	__% Immature	__Feeble
✓in flower	__	51-100	__	__5-10yd²	__% 1st Year	✓Normal
✓Immature fruit	__	101-1000	__	__10-100yd²	100% Mature (established)	__Vigorous
__Mature fruit	✓	1001-10,000	__	✓100yd² -2ac	__%Senescent	__Exceptionally Vigorous
__Seed dispersing	__	10K+	__	__2ac+	__ Unknown	
__Dormant	__	actual # (If known)	__			

Comments on above: site is 300 m long, 50 m wide - south side of Road.
Evidence of reproduction ____yes ____no Explain:____________
Type of reproduction: ______sexual ______asexual _____both
Evidence of symbiotic or parasitic relationship: ___yes ___no Explain:____________
Evidence of disease, predation, etc. ___yes ___no Explain:____________

HABITAT

Aspect	Slope	Light	Topographic	Moisture
__N __NE	__Flat	✓Open	✓Crest	__Inundated (Hydric)
__E __NW	✓0-10	__Partial	✓Upper Slope	__Intermittently flooded
__S __SE	__10-35	__Filtered	✓Mid-Slope	✓Saturated (Wet-mesic)
__W __SW	__35+	__Shade	__Lower-Slope	✓Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation:____________ ft to ____________ ft
Cross section topography (habitat)/ include scale, direction, element position



(meadow is used as an overflow grazing area, so it is not frequently grazed).

HABITAT (continued)

ssociated natural community/plant community: roadside & adjacent hay meadow
atural community form completed? _____ yes _____ no
ssociated plant species: Indian paint brush, Yarrow, V. Radiata, fleabane, milkweed, yellow clover, coreopsis, Plantago, Venus' looking glass, Juncus
ıbstrate: clay

IDENTIFICATION

ıotograph taken? ✓ yes _____ no
ɔecimen taken? ✓ yes _____ no If yes, give collection # and repository: _____

o other members of this genus co-occur at this site? ✓ yes _____ no If yes, complete below:
List: V. Radiata
Hybridization? _____ yes ✓ no
Identification problems? _____ yes ✓ no Explain: _____

CONSERVATION

wner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ✓ unknown
vidence of disturbance: mowing, & possible grazing in hay meadow
.ventory needs: _____
ata security? _____ yes _____ no Explain: _____

SUMMARY

Ɔ Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

Ɔ Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

Ɔ Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

Ɔ Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

Ɔ Rank: (ie, a summary of all factors listed above)
A (B) C D
Comments: _____

Sec. 9; 16 T11N-R20E

5/19/99
VANW-10

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

Site Name: Intersection NS439 & EW109 Date: 19 May Source Code:
Quad Name(s): Holt Mountain Quad Code(s): 3509542
State: OK County(ies): Muskogee Field Quad Margin #:
Full extent of EO known and mapped? ____yes ____no
Precise locations of individuals or groups mapped on base map? ____yes ____ no

BIOLOGY

Valerianella nuttallii

Element Name:
Element Code:_____ Occurrence #:_____

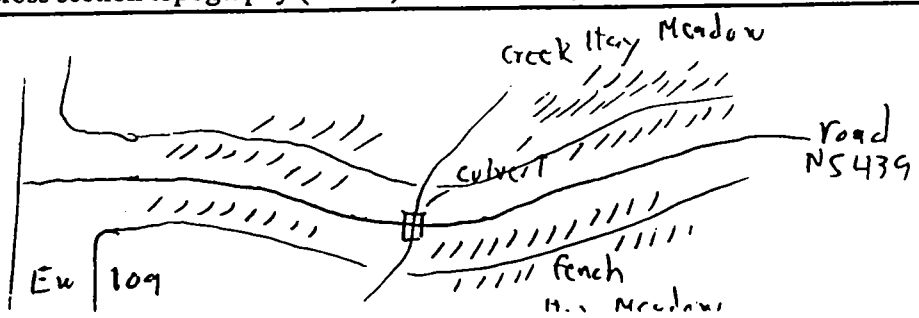
Phenology	Pop Size		Pop Area	Age Structure	Vigor
	Ramets	Genets			
__in leaf	__ 1-10	__	__1yd²	__% Seedlings	__Very Feeble
__in bud	__ 11-50	__	__1-5yd²	__% Immature	__Feeble
✓in flower	__ 51-100	__	__5-10yd²	__% 1st Year	__Normal
✓Immature fruit	__ 101-1000	__	__10-100yd²	100 % Mature	✓Vigorous
✓Mature fruit	✓1001-10,000	__	__100yd² -2ac	(established)	__Exceptionally
__Seed dispersing	✓ 10K+	__	✓2ac+	__%Senescent	Vigorous
__Dormant	____actual #____			__ Unknown	
	(If known)				

Comments on above: Site is 500 m long, both roadsides and 10-30 m into hay meadows
Evidence of reproduction ✓yes ____no Explain:
Type of reproduction: ✓sexual ____asexual ____both
Evidence of symbiotic or parasitic relationship: ___yes ✓no Explain:
Evidence of disease, predation, etc. ___yes ✓no Explain:

HABITAT

Aspect	Slope	Light	Topographic	Moisture
__N ✓NE	__Flat	✓Open	__Crest	__Inundated (Hydric)
__E__NW	✓0-10	__Partial	✓Upper Slope	__Intermittently flooded
__S__SE	__10-35	__Filtered	✓Mid-Slope	__Saturated (Wet-mesic)
__W__SW	__35+	__Shade	__Lower-Slope	✓Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation:_____ ft to _____ ft
Cross section topography (habitat)/ include scale, direction, element position



HABITAT (continued)

ssociated natural community/plant community: ______

atural community form completed? ____ yes ____ no

ssociated plant species: Rubus (along fence) Coreopsis, Indian Paint Brush, Delphinium, Fleabane, Allium, Rumex, Celtis, Yarrow

ıbstrate: Clay with large pieces of limestone 15-50 cm across

IDENTIFICATION

ıotograph taken? ____ yes ____ no

ɔecimen taken? ✓ yes ____ no If yes, give collection # and repository: ______

o other members of this genus co-occur at this site? ✓ yes ____ no If yes, complete below:

List: Val radiata

Hybridization? ____ yes ✓ no

Identification problems? ____ yes ✓ no Explain: ______

CONSERVATION

wner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ____ unknown

ridence of disturbance: weedy shrubs becoming established, needs to be mowed

ventory needs: ______

ıta security? ____ yes ____ no Explain: ______

SUMMARY

ɔ Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)

A-Excellent (B)-Good C-Marginal D-Poor

Comments: ______

ɔ Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)

A-Excellent B-Good (C)-Marginal D-Poor

Comments: ______

ɔ Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)

A-Excellent (B)-Good C-Marginal D-Poor

Comments: ______

ɔ Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)

A-Excellent B-Good (C)-Marginal D-Poor

Comments: ______

ɔ Rank: (ie, a summary of all factors listed above)

A B B/C C D

Comments: ______

sc. 21 T12N-R20E

5/19/99

VANU-11

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

Site Name: 3/10 Mile east of junction NS 439, ON US 69. Date: 19 May 1999 Source Code: _____

Quad Name(s): Holt Mountain Quad Code(s): 3509542

State: OK County(ies): Muskogee Field Quad Margin #: _____

Full extent of EO known and mapped? ____yes ____no

Precise locations of individuals or groups mapped on base map? ____yes ____ no

BIOLOGY

Valerianella nuttallii

Element Name:

Element Code: _____ Occurrence #: _____

Phenology	Pop Size (Ramets)	Pop Size (Genets)	Pop Area	Age Structure	Vigor
__in leaf	__ 1-10	__	__1yd²	__% Seedlings	__Very Feeble
__in bud	__ 11-50	__	__1-5yd²	__% Immature	__Feeble
✓in flower	__ 51-100	__	__5-10yd²	__% 1st Year	✓Normal
✓Immature fruit	✓101-1000	__	__10-100yd²	100% Mature (established)	__Vigorous
__Mature fruit	__1001-10,000	__	✓100yd² -2ac	__%Senescent	__Exceptionally Vigorous
__Seed dispersing	__ 10K+	__	__2ac+	__ Unknown	
__Dormant	____actual #____				
	(If known) 500-1000				

Comments on above: 110 meters on North side of Road

Evidence of reproduction ✓yes ____no Explain: _____

Type of reproduction: ✓sexual _____asexual _____both

Evidence of symbiotic or parasitic relationship: ___yes ✓no Explain: _____

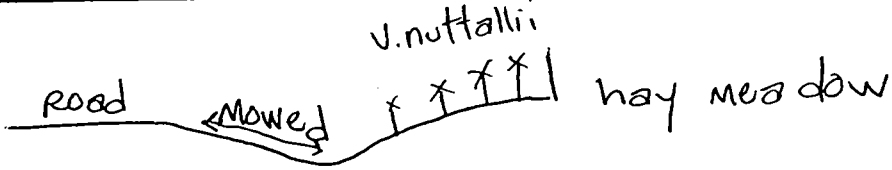
Evidence of disease, predation, etc. ___yes ✓no Explain: _____

HABITAT

Aspect	Slope	Light	Topographic	Moisture
✓N __NE	__Flat	✓Open	✓Crest	__Inundated (Hydric)
__E __NW	✓0-10	__Partial	✓Upper Slope	__Intermittently flooded
__S __SE	__10-35	__Filtered	✓Mid-Slope	__Saturated (Wet-mesic)
__W __SW	__35+	__Shade	__Lower-Slope	✓Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation: _____ ft to _____ ft

Cross section topography (habitat)/ include scale, direction, element position



HABITAT (continued)

ssociated natural community/plant community: Roadside
atural community form completed? _____ yes _____ no
ssociated plant species: Coreopsis, Delphinium, Yarrow, Indian Paint brush, Echinacea pallida, Rose, Yellow clover,
ıbstrate: clay, limestone

IDENTIFICATION

ıotograph taken? ____ yes ✓ no
ɔecimen taken? ✓ yes ____ no If yes, give collection # and repository: _____
o other members of this genus co-occur at this site? ✓ yes ____ no If yes, complete below:
List: V. radiata
Hybridization? ____ yes ✓ no
Identification problems? ____ yes ✓ no Explain: _____

CONSERVATION

wner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ✓ unknown
vidence of disturbance: MOWING -
ventory needs: _____
ata security? ____ yes ____ no Explain: _____

SUMMARY

Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

Rank: (ie, a summary of all factors listed above)
A B (C) D
Comments: _____

ec. 26 T12N - R18E

5/19/99

VANA-12

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

Site Name: 1.9 miles E. Shady Grove Road on East 1057 Date: 19 May 99 Source Code: _____

Quad Name(s): WARNER Quad Code(s): 3509593

State: OK County(ies): McIntosh Field Quad Margin #: _____

Full extent of EO known and mapped? _____yes _____no

Precise locations of individuals or groups mapped on base map? _____yes _____ no

BIOLOGY

Valerianella nuttallii

Element Name:

Element Code: _____ Occurrence #: _____

Phenology	Pop Size Ramets	Pop Size Genets	Pop Area	Age Structure	Vigor
__in leaf	__ 1-10	__	__1yd²	__% Seedlings	__Very Feeble
__in bud	__ 11-50	__	__1-5yd²	__% Immature	__Feeble
~~in~~ flower	__ 51-100	__	__5-10yd²	__% 1st Year	✓Normal
✓Immature fruit	__ 101-1000	__	__10-100yd²	100 % Mature	__Vigorous
✓Mature fruit	✓1001-10,000	__	__100yd² -2ac	(established)	__Exceptionally
✓Seed dispersing	__ 10K+	__	__2ac+	__%Senescent	Vigorous
__Dormant	____actual #____			__ Unknown	
	(If known) about 3,000				

Comments on above: Pop. covers 100m. of roadside and occurs in adjacent hay meadows

Evidence of reproduction ✓yes ____no Explain: _____

Type of reproduction: _____✓sexual _____asexual _____both

Evidence of symbiotic or parasitic relationship: ___yes ___no Explain: _____

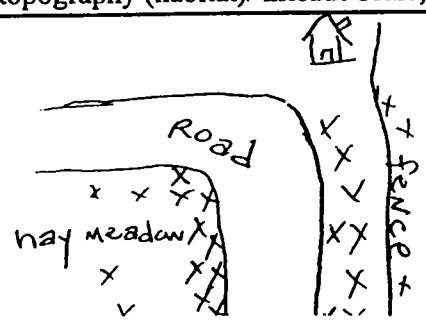
Evidence of disease, predation, etc. ___yes ___no Explain: _____

HABITAT

Aspect	Slope	Light	Topographic	Moisture
__N __NE	__Flat	✓Open	__Crest	__Inundated (Hydric)
__E __NW	✓0-10	__Partial	__Upper Slope	__Intermittently flooded
__S __SE	__10-35	__Filtered	__Mid-Slope	__Saturated (Wet-mesic)
__W __SW	__35+	__Shade	__Lower-Slope	✓Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation: _____ ft to _____ ft

Cross section topography (habitat)/ include scale, direction, element position



x = V. nuttallii

Pop. stops at mowed adjacent field.

HABITAT (continued)

ssociated natural community/plant community: Roadside hay meadow
latural community form completed? _____ yes _____ no
ssociated plant species: Yellow clover, Indian paintbrush, Coreopsis, Delphinium, V. Radiata, Blackberry, Fleabane,
ubstrate: Sandy clay.

IDENTIFICATION

hotograph taken? ✓ yes ___ no
pecimen taken? ✓ yes ___ no If yes, give collection # and repository: _____
o other members of this genus co-occur at this site? ✓ yes ___ no If yes, complete below:
List: V. Radiata
Hybridization? ___ yes ✓ no
Identification problems? ___ yes ✓ no Explain: _____

CONSERVATION

wner aware of EO? ___ yes ___ no ✓ unknown Owner protecting EO? ___ yes ___ no ✓ unknown
vidence of disturbance: _____
ventory needs: _____
ata security? ___ yes ___ no Explain: _____

SUMMARY

O Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

O Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

O Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

O Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent (B)-Good C-Marginal D-Poor
Comments: _____

O Rank: (ie, a summary of all factors listed above)
A (B) C D
Comments: _____

ec,36 T10N R20E

5-27-99
VANU-13

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

te Name: Perry Road, 2.5 miles N. of Stigler Date: 27 May 99 Source Code: ______
uad Name(s): Stigler West Quad Code(s): 3509532
tate: OK County(ies): Haskell Field Quad Margin #: ______
ıll extent of EO known and mapped? ____yes ____no
'recise locations of individuals or groups mapped on base map? ____yes ____no

BIOLOGY

Valerianella nuttallii

lement Name:
lement Code: ______ Occurrence #: ______

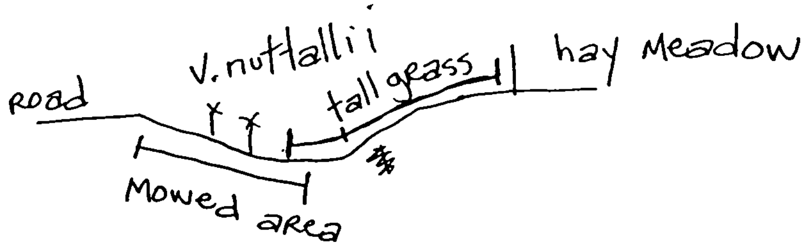
henology	Pop Size Ramets		Genets	Pop Area	Age Structure	Vigor
_in leaf	__	1-10	__	__1yd²	__% Seedlings	__Very Feeble
_in bud	__	11-50	__	__1-5yd²	__% Immature	✓ Feeble
✓ in flower	✓	51-100	__	__5-10yd²	__% 1st Year	__Normal
✓ Immature fruit	__	101-1000	__	✓ 10-100yd²	✓ % Mature (established)	__Vigorous
✓ Mature fruit	__	1001-10,000	__	__100yd² -2ac		__Exceptionally Vigorous
_Seed dispersing	__	10K+	__	__2ac+	__%Senescent	
_Dormant	__	actual # 76 (If known)		about 100yd.	__ Unknown	

:omments on above: west side road only ~~(...)~~
:vidence of reproduction ✓ yes ____no Explain: ______
Type of reproduction: ✓ sexual ____asexual ____both
'vidence of symbiotic or parasitic relationship: ____yes ✓ no Explain: ______
:vidence of disease, predation, etc. ____yes ✓ no Explain: ______

HABITAT

spect	Slope	Light	Topographic	Moisture
__N __NE	__Flat	✓ Open	__Crest	__Inundated (Hydric)
__E __NW	✓ 0-10	__Partial	✓ Upper Slope	__Intermittently flooded
__S __SE	__10-35	__Filtered	✓ Mid-Slope	__Saturated (Wet-mesic)
__W __SW	__35+	__Shade	__Lower-Slope	✓ Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation: ______ ft to ______ ft
Cross section topography (habitat)/ include scale, direction, element position



V. nuttallii occurs onl in mowed area (must - have been mowed earlier this year.) NONE in high grass

HABITAT (continued)

ssociated natural community/plant community: Roadside
atural community form completed? _____ yes _____ no
ssociated plant species: Fleabane, Yarrow, Yellow clover, white clover, purple vetch, Indian paintbrush, V. radiata
ıbstrate: Clay

IDENTIFICATION

ıotograph taken? ____ yes ✓ no
ɔecimen taken? ✓ yes ____ no If yes, give collection # and repository: _____
o other members of this genus co-occur at this site? ✓ yes ____ no If yes, complete below:
List: V. radiata
Hybridization? ____ yes ✓ no
Identification problems? ____ yes ✓ no Explain: _____

CONSERVATION

wner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ✓ unknown
vidence of disturbance: mowing - site already mowed this year - most plants appear to have lost their main stem.
ventory needs: _____
ata security? ____ yes ____ no Explain: _____

SUMMARY

) Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: Small pop.

) Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: Mowing - timing

) Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

) Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

) Rank: (ie, a summary of all factors listed above)
A B (C) D
Comments: _____

ec. 19 T 10N R 21E

VANU-14
5-27-99

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

te Name: Perry Road, 5 miles N. of Stigler Date: 27May99 Source Code: _____
ıad Name(s): Stigler West Quad Code(s): 3509532
tate: OK County(ies): Haskell Field Quad Margin #: _____
ıll extent of EO known and mapped? ____yes ____no
recise locations of individuals or groups mapped on base map? ____yes ____no

BIOLOGY

Valerianella nuttallii

lement Name:
lement Code: _____ Occurrence #: _____

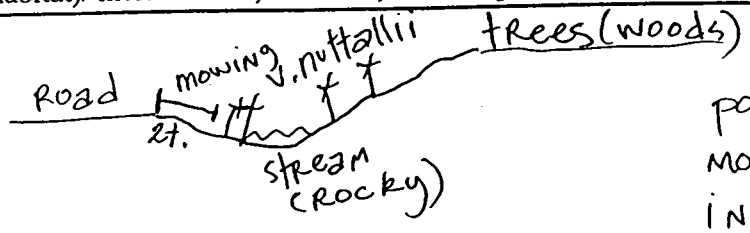
henology	Pop Size Ramets	Pop Size Genets	Pop Area	Age Structure	Vigor
_in leaf	__ 1-10	__	__1yd²	__% Seedlings	__Very Feeble
_in bud	✓ 11-50	__	__1-5yd²	__% Immature	✓Feeble
in flower	__ 51-100	__	__5-10yd²	__% 1st Year	__Normal
Immature fruit	__ 101-1000	__	✓10-100yd²	100 ✓% Mature	__Vigorous
Mature fruit	__1001-10,000	__	__100yd² -2ac	(established)	__Exceptionally
Seed dispersing	__ 10K+	__	__2ac+	__%Senescent	Vigorous
_Dormant	____actual #42 (If known)		30 yd.	__ Unknown	

Comments on above: east side Road only
Evidence of reproduction ✓yes ___no Explain: _____
Type of reproduction: ✓sexual _____asexual _____both
Evidence of symbiotic or parasitic relationship: ___yes ✓no Explain: _____
Evidence of disease, predation, etc. ___yes ✓no Explain: _____

HABITAT

spect	Slope	Light	Topographic	Moisture
_N __NE	__Flat	✓Open	__Crest	__Inundated (Hydric)
_E __NW	✓0-10	✓Partial	__Upper Slope	__Intermittently flooded
_S __SE	__10-35	__Filtered	✓Mid-Slope	✓Saturated (Wet-mesic)
_W __SW	__35+	__Shade	✓Lower-Slope	✓Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

Elevation: _____ ft to _____ ft
Cross section topography (habitat)/ include scale, direction, element position



pop. on edge of mowed area & in areas w/out tall grass.

HABITAT (continued)

ssociated natural community/plant community: _____
atural community form completed? _____ yes _____ no
ssociated plant species: Yellow Clover, Fleabane, Indian paintbrush, Yarrow, V. radiata
ubstrate: clay, limestone

IDENTIFICATION

notograph taken? ____ yes ✓ no
pecimen taken? ✓ yes ____ no If yes, give collection # and repository: _____
o other members of this genus co-occur at this site? ✓ yes ____ no If yes, complete below:
List: V. radiata
Hybridization? ____ yes ✓ no
Identification problems? ____ yes ✓ no Explain: _____

CONSERVATION

wner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ✓ unknown
vidence of disturbance: mowing, spraying, most plants appear to be cut by mower.
ventory needs: _____
ata security? ____ yes ____ no Explain: _____

SUMMARY

) Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: Small pop.

) Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: mowing –

) Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

) Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: mowing - timing.

) Rank: (ie, a summary of all factors listed above)
A B (C) D
Comments: _____

ec. 20 11N R21E

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

6/3/99
VANU-15

te Name: Highway 10, 10 miles N. of Braggs Date: 3 June 99 Source Code: _____
ıad Name(s): Fort Gibson Dam Quad Code(s): 3509572
tate: OK County(ies): Muskogee Field Quad Margin #: _____
ıll extent of EO known and mapped? _____yes _____no
recise locations of individuals or groups mapped on base map? _____yes _____ no

BIOLOGY

Valerianella nuttallii

lement Name:
lement Code: _____ Occurrence #: _____

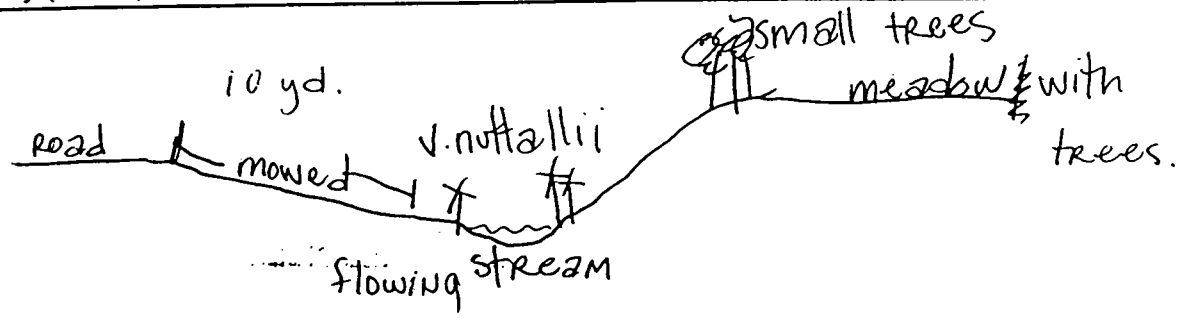
ıenology	Pop Size Ramets	Pop Size Genets	Pop Area	Age Structure	Vigor
_in leaf	__ 1-10	__	__1yd²	__% Seedlings	__Very Feeble
_in bud	✓ 11-50	__	__1-5yd²	__% Immature	✓ Feeble
_in flower	__ 51-100	__	__5-10yd²	__% 1st Year	__Normal
_Immature fruit	__ 101-1000	__	✓ 10-100yd²	100% Mature (established)	__Vigorous
_Mature fruit	__1001-10,000	__	__100yd² -2ac	__%Senescent	__Exceptionally Vigorous
_Seed dispersing	__ 10K+	__	__2ac+	__ Unknown	
_Dormant	____actual #____ (If known) about 20				

:omments on above: east side of road only
.vidence of reproduction ✓ yes ____no Explain: _____
'ype of reproduction: ✓ sexual _____asexual _____both
'vidence of symbiotic or parasitic relationship: ___yes ✓ no Explain: _____
:vidence of disease, predation, etc. ___yes ✓ no Explain: _____

HABITAT

spect	Slope	Light	Topographic	Moisture
_N __NE	__Flat	✓ Open	__Crest	__Inundated (Hydric)
_E __NW	✓ 0-10	__Partial	✓ Upper Slope	__Intermittently flooded
_S __SE	__10-35	__Filtered	✓ Mid-Slope	✓ Saturated (Wet-mesic)
_W __SW	__35+	__Shade	✓ Lower-Slope	__Moist (Mesic)
	__Vertical		__Bottom	__Dry (Mesic)
				__Dry (Xeric)

:levation: _____ ft to _____ ft
:ross section topography (habitat)/ include scale, direction, element position



HABITAT (continued)

ssociated natural community/plant community: Roadside
ıtural community form completed? _____ yes _____ no
ssociated plant species: Black eyed Susan, Indian Paintbrush, Fleabane, Apiaceae, V. longiflora, V. radiata, V. longiflora, yellow clover
ıbstrate: Clay, limestone

IDENTIFICATION

ıotograph taken? ____ yes ✓ no
ecimen taken? ✓ yes ____ no If yes, give collection # and repository: _____

other members of this genus co-occur at this site? ✓ yes ____ no If yes, complete below:
List: V. radiata and V. longiflora → both much more abundant than V. nuttallii.
Hybridization? ____ yes ✓ no
Identification problems? ____ yes ✓ no Explain: _____

CONSERVATION

wner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ✓ unknown
vidence of disturbance: mowing, tall grass in un mowed area
ventory needs: _____
ata security? ____ yes ____ no Explain: _____

SUMMARY

Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent B-Good (C)-Marginal D-Poor
Comments: _____

Rank: (ie, a summary of all factors listed above)
A B (C) D
Comments: _____

ec. 34 T 15N R20E

OKLAHOMA NATURAL HERITAGE INVENTORY
SPECIAL PLANT SURVEY FORM

6/17/99
VANU-16

ff of Platoon Assault Course Rd) area 402.
te Name: CAMP GRUBER, Plot #508, TRAINING Date: 6/17/99 Source Code: _____
uad Name(s): BRAGGS Quad Code(s): 35095562
tate: OK County(ies): Muskogee Co. Field Quad Margin #: _____
ull extent of EO known and mapped? ____yes ____no
recise locations of individuals or groups mapped on base map? _____yes _____ no

BIOLOGY

Valerianella nuttallii

lement Name:
lement Code: _____ Occurrence #: _____

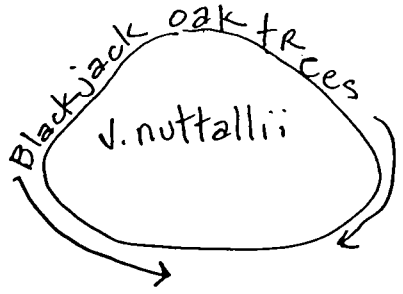
henology	Pop Size Ramets	Pop Size Genets	Pop Area	Age Structure	Vigor
_in leaf	__ 1-10	__	__1yd²	__% Seedlings	__Very Feeble
_in bud	__ 11-50	__	__1-5yd²	__% Immature	__Feeble
in flower	__ 51-100	__	__5-10yd²	__% 1st Year	✓Normal
~~Immature fruit~~	__ 101-1000	✓	__10-100yd²	100 % Mature	__Vigorous
~~Mature fruit~~	__1001-10,000__		__100yd² -2ac	(established)	__Exceptionally
~~Seed dispersing~~	__ 10K+	__	__2ac+	__%Senescent	Vigorous
_Dormant	____actual #____ (If known)		25m x 100m	__ Unknown	

Comments on above: _____
Evidence of reproduction ✓ yes ____no Explain: _____
Type of reproduction: ___✓___sexual _____asexual _____both
Evidence of symbiotic or parasitic relationship: ___yes ✓no Explain: _____
Evidence of disease, predation, etc. ___yes ✓no Explain: _____

HABITAT

Aspect	Slope	Light	Topographic	Moisture
_N __NE	~~Flat~~	~~Open~~	__Crest	__Inundated (Hydric)
_E __NW	__0-10	__Partial	__Upper Slope	__Intermittently flooded
_S __SE	__10-35	__Filtered	__Mid-Slope	__Saturated (Wet-mesic)
_W __SW	__35+	__Shade	__Lower-Slope	__Moist (Mesic)
	__Vertical		__Bottom	✓~~Dry~~ (Mesic)
				__Dry (Xeric)

Elevation: _____ ft to _____ ft
Cross section topography (habitat)/ include scale, direction, element position



disturbance (25m x 100m) in oak forest. (Black jack oak)

HABITAT (continued)

ssociated natural community/plant community: meadow (disturbance) in forest
atural community form completed? _____ yes _____ no
ssociated plant species: Coreopsis tinctoria, Quercus marilandica, Physalis canarensis, Specularia perfoliata, Indian paintbrush, Schrankia nuttallii, Mockernut hickory
ıbstrate: Silty Loam

IDENTIFICATION

ıotograph taken? ____ yes ✓ no
ɔecimen taken? ✓ yes ____ no If yes, give collection # and repository: _____

o other members of this genus co-occur at this site? ✓ yes ____ no If yes, complete below:
List: V. longifloria
Hybridization? ____ yes ✓ no
Identification problems? ✓ yes ____ no Explain: both species almost finished flowering, many individuals lack flowers.

CONSERVATION

wner aware of EO? ____ yes ____ no ✓ unknown Owner protecting EO? ____ yes ____ no ✓ unknown
ıidence of disturbance: grazing (deer, elk), possible burning, "Biv-wacking" site (tent pitching)
ventory needs: _____
ıta security? ____ yes ____ no Explain: _____

SUMMARY

) Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)
A-Excellent (B) Good C-Marginal D-Poor
Comments: _____

) Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)
(A) Excellent B-Good C-Marginal D-Poor
Comments: _____

) Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)
(A) Excellent B-Good C-Marginal D-Poor
Comments: _____

) Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)
A-Excellent (B) Good C-Marginal D-Poor
Comments: _____

) Rank: (ie, a summary of all factors listed above)
A (B) C D
Comments: _____