WISCONSIN—*cont.*

Locality	*No.*	*Date*	*Reference and authority*	*Remarks*
Milwaukee Harbor	2	Feb. 9, 1922	O. J. Gromme. Two swam in; shot the male but lost him, secured the other. (Taken from field notes.)	Specimens; by letter
Lake Koshkonong	1	Nov. 14, 1896	Barrows, Michigan Bird Life: 99, 1912.	
			MINNESOTA	
Big Woods	1	1877	Roberts, Notes on Birds of Minnesota, in Geol. and Nat. Hist. Survey Minnesota: 65, 1892 (Hatch).	Specimen
Big Woods	1	1881	Roberts, Notes on Birds of Minnesota, in Geol. and Nat. Hist. Survey Minnesota: 65, 1892 (Hatch).	Specimen
Near Iowa state line	1	1891	Roberts, Notes on Birds of Minnesota, in Geol. and Nat. Hist. Survey Minnesota: 65, 1892 (Hatch).	Specimen
.....	1	.....	Roberts, Notes on Birds of Minnesota, in Geol. and Nat. Hist. Survey Minnesota: 65, 1892 (Hatch). (Dr. Hvoslef has a female.)	Specimen
Lake-of-the-woods	+	April, 1912	Roberts, Birds of Minnesota: 269, 1932. (T. Surber notes several flocks.)	Sight
Le Clair Point	1	April 10, 1912	Birds of Minnesota: 269, 1932. (Reported by Dr. Roberts.)	Specimen
Grand Marais	+	Nov. 30, 1928	Birds of Minnesota: 269, 1932. (Reported by Dr. W. P. Abbott.)	Sight
			IOWA	
Independence	1	Oct. 11, 1892	R. W. Anderson, Proc. Davenport Acad. Sci. 11: 177, 1907.	Specimen
Pottawattamie	...	.....	R. W. Anderson, Proc. Davenport Acad. Sci. 11: 177, 1907.	Sight
Linn	...	.....	R. W. Anderson, Proc. Davenport Acad. Sci. 11: 177, 1907.	Sight
Keokuk	...	.....	R. W. Anderson, Proc. Davenport Acad. Sci. 11: 177, 1907.	Sight

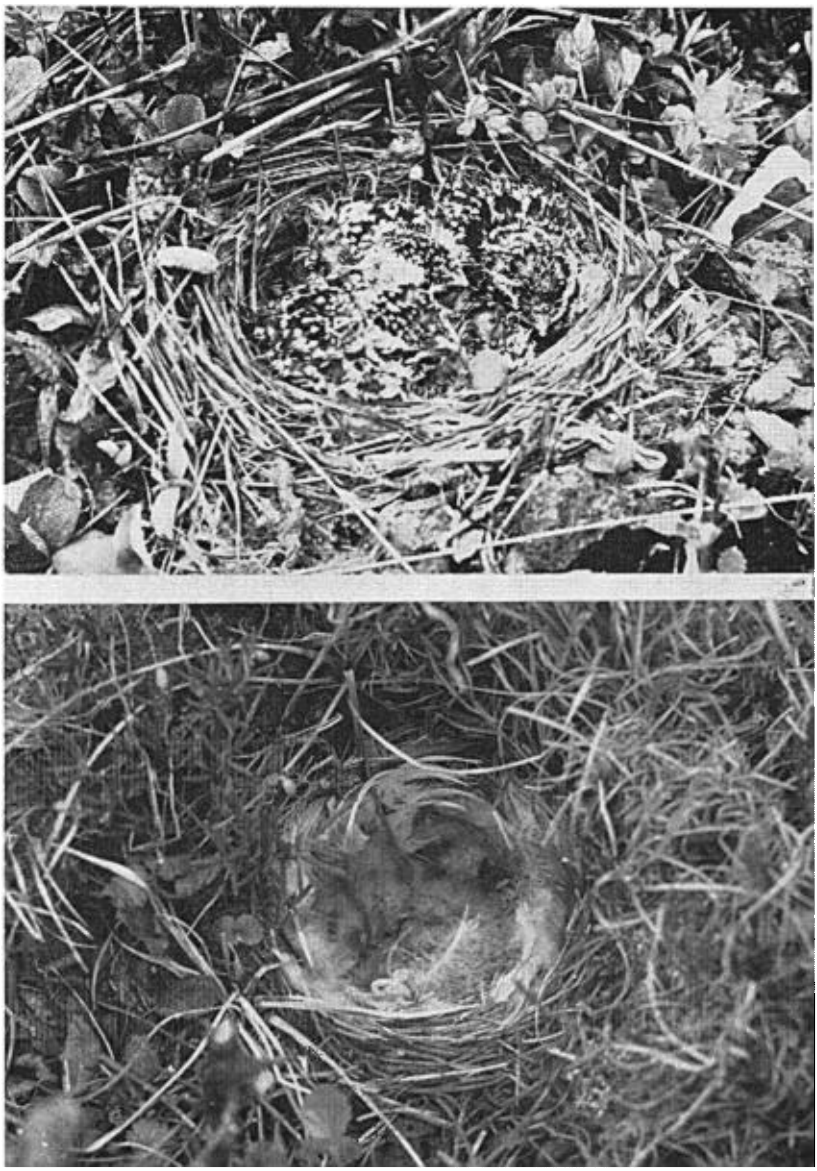
U. S. National Museum
Washington, D. C.

NOTES ON BREEDING LAPLAND LONGSPURS AT CHURCHILL, MANITOBA

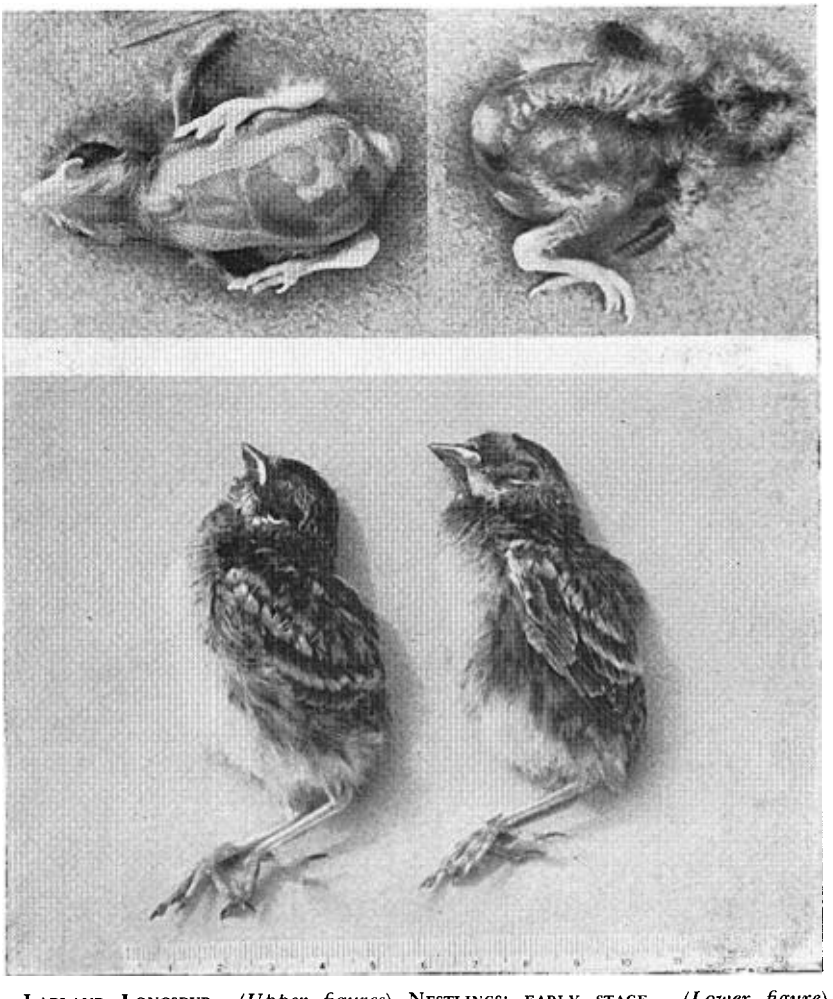
BY LAWRENCE I. GRINNELL

Plates 23–25

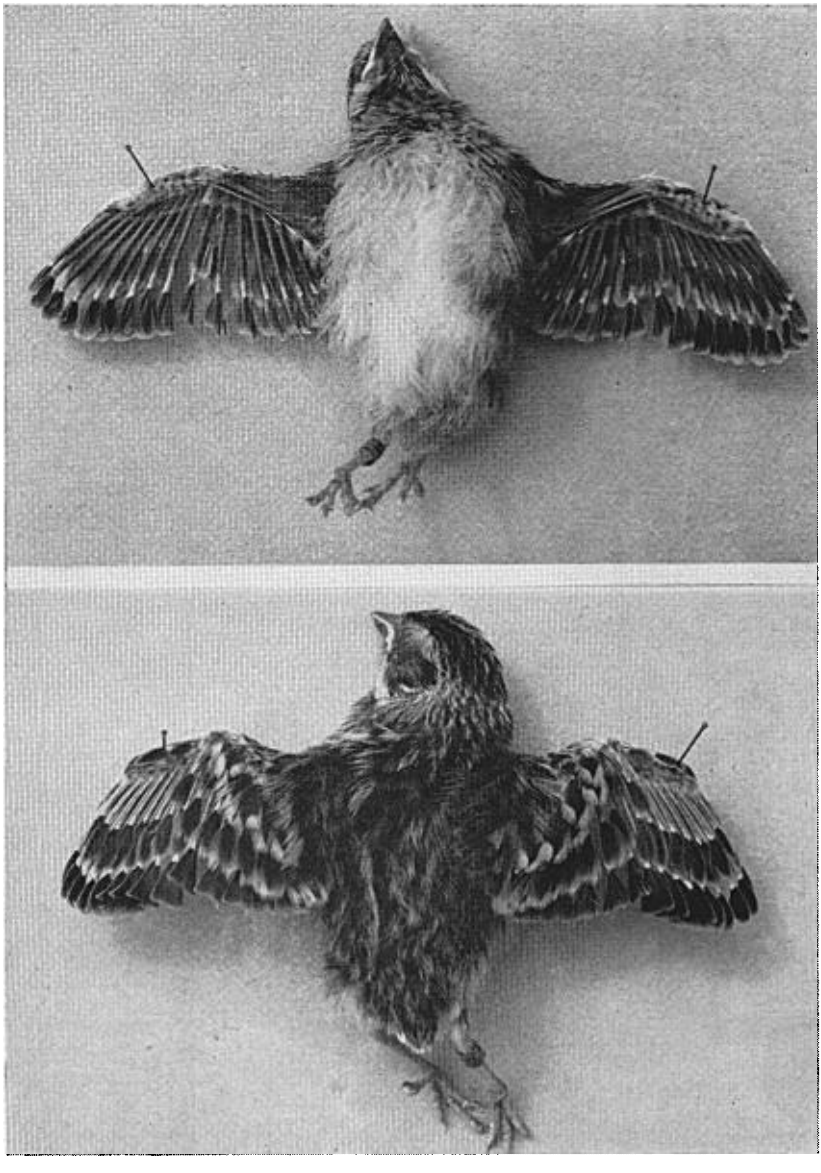
DURING a stay at Churchill, Manitoba, from June 2 to July 23, 1940, for the purpose of studying and photographing birds, the writer had opportunity to observe the reproductive habits of Lapland Longspurs (*Calcarius lapponicus lapponicus*). He is greatly indebted to Dr. Ralph S. Palmer for his assistance and advice during this study, and for the photographs reproduced herewith, and to Henry Dietrich of Cornell University, Carl Heinrich of the U. S. Department of Agriculture, and Dr. Walter C. Muenscher of Cornell University for their



LAPLAND LONGSPUR.—(*Upper figure*) YOUNG ABOUT READY TO LEAVE THE NEST. (*Lower figure*) YOUNG IN EARLY STAGE OF DEVELOPMENT.



LAPLAND LONGSPUR.—(*Upper figures*) NESTLINGS; EARLY STAGE. (*Lower figure*) ABOUT TEN DAYS OLD.



LAPLAND LONGSPUR.—YOUNG ABOUT TEN DAYS OLD.

identifications of material found in the stomachs of the birds that were collected.

PRE-NESTING ACTIVITIES

For about a month after my arrival at Churchill on June 2 I saw several Lapland Longspurs almost every day. In company with Northern Horned Larks (*Otocoris a. alpestris*) they fed on millet placed on a stone in front of two cabins three miles southeast of Churchill where my companion, Dr. Ralph S. Palmer, and I stayed. They continued to feed on the millet for about two weeks, until the nesting season got under way and they became shy.

VOICE

The song of the Lapland Longspur starts squeakily, like that of the Horned Lark, but differs in having an attractive, upturned, conversational ending, sounding like *sissawoo-weer,* or *seree-ar;* the entire call suggests the phrase, "the winter in Churchill is very severe." The song of the less common Smith's Longspur (*C. pictus*) is entirely different, sweeter in quality, and ending as if with an Italian-sounding name, *De Vespisi* (phonetically, *day-vespeezee*). The Lapland Longspur usually uttered its song from a conspicuous tundra hammock, or from the top of Churchill's water-pipe line, whereas the Smith's Longspur more often sang at the top of a dwarf spruce. On one occasion two male Smith's Longspurs were singing from perches within twenty feet of each other. The Smith's Longspurs also were in the habit of flitting around to a greater number of singing positions than the Lapland Longspur. The Horned Lark type of song of the latter was often given during a flight in which the bird ascended steeply, sometimes up about forty feet, then sailed gradually, with few wing-beats, to the ground some distance away, all the while uttering its song.

While hopping around near the nest, the male was heard to utter a call resembling *cheerio;* the female, a low *chirrup.* On my approaching the nest of one wary female, the bird would flush, promenade nervously, simulate picking imaginary materials off the ground, and emit a hoarse alarm note, *hee* (not uttered by others observed); also another metallic note, *kittyoo,* or *kee-you.*

NESTS

Nests were discovered between June 17 and 30. *C. lapponicus* appeared to be nesting somewhat earlier than its associate, *C. pictus.* I found no Smith's Longspur nest, but on June 20 I heard the song of a Lapland Longspur only once during the day, whereas the Smith's Longspurs were singing almost incessantly. As late as July 14, the

excited calls of two parent birds of the latter species attracted my attention to a fledgling walking on the ground.

All five nests were found within a radius of about one mile of camp. The shortest distance between any two nests was about 200 yards. During the period of active nesting, the tundra environment was soggy and full of little pools of water, but later became much drier.

All nests were situated in depressions on the ground. Three of these depressions were in small tufts of grass. Concealment of the nest not placed in a tuft was poorest; two of the tuft nests had a fair degree of concealment; the fourth nest was well concealed because of being partly covered by woody twigs.

Measurements of four nests showed, for interior nest diameter at top, a range of 6 to 7 cm., or an average of 6.75 cm.; for interior depth, a range of 3 to 6 cm., or an average of 4.50 cm. Nesting materials were grasses and ptarmigan feathers. Number of eggs per clutch was four to five [H. M. S. Blair (Birds of East Finmark, Ibis, ser. 13, 6: 301–302, 1936) reports the finding of sets of seven on three occasions in East Finmark]. Incubation dates for one nest extended from June 17, or earlier, to June 27 to 30, making a total incubation period of over 10 days; for a second nest, before June 20 to June 28 and 29. Hatching dates varied from around June 25 to 30. In four nests the number of chicks per brood ranged from two (where an infertile egg also was found) to four (in the case of three nests). The nestling period for one brood watched was between 10 and 11 days. The fate of the nestlings in one nest was uncertain but, based on three other nests, out of 12 eggs or nestlings first discovered, six individuals, or 50 per cent, were able to leave the nest.

BEHAVIOR

The distance at which nesting birds would flush on approach varied considerably. One female with four young, four days old, allowed approach to within two feet before flushing; another shier individual would flush at fifty yards distance and fly toward the intruder, uttering the *hee* note. After the observer entered a blind, the birds usually returned within five minutes, sometimes immediately. On leaving the nest, whether surprised or not, they usually flew off fifty to one hundred feet, then fed on the ground. Returning, they either flew directly back, or sneaked back on foot in furrows, occasionally stretching up the neck to reconnoitre. The male walked fast, with a slight hop now and then, holding his back horizontal and his head forward, low and facing directly ahead, suggestive of a locomotive headlight in miniature.

During incubation and brooding, female Lapland Longspurs usually ignored small noises made in the blind, such as the humming of a moving-picture camera, and also the longer songs of near-by associates, such as the Smith's Longspur, Savannah, White-crowned and Tree Sparrows, Robin, and Horned Lark, or the aërial whinnying of a Wilson's Snipe. But they were promptly alert to short call notes, such as the Redpoll's *chit-chit-chit* when flying, or its *tu-wee* when perching, the Semipalmated Plover's *keerweet,* and the calls of the Hudsonian Curlew and Stilt Sandpiper.

Incubation and Brooding

During a total period of 11 hours, 53 minutes of observation during seven different days between June 21 and July 3, incubating and brooding females were recorded off the nest 302 minutes, or 42 per cent; on the nest, 411 minutes, or 58 per cent. On a relatively warm July day, there were only five feedings of five to six-day nestlings in 77 minutes, or only once every 15.4 minutes. Instead, the parent spent much time with wings spread over the young. On the following cooler day, however, the parent was kept busily engaged in procuring food for its hungry offspring. Thus, on this day, an average of only seven full minutes out of a total of 83, or only eight per cent, were occupied on the nest, although the bird visited it twenty times, or once almost every four minutes.

Eggs

Egg weights (in grams) of five eggs from the same nest measured on June 29 were as follows: 2.2, 2.3, 2.4 (2), 2.6; average 2.38 gm. On June 29, egg shells of nestlings just hatched were absent, suggesting that they were removed from the nest.

Development of Nestlings

The following brief notes cover observations on the daily development of nine different Lapland Longspur nestlings. The notes are integrated from different sources. Remarks for Day 1 were based on six individuals; for Days 2 to 8, mainly one individual; Days 9 and 10, two different individuals.

Feather Tracts

Day 1. Down present on dorsal tract (none on back of neck), wing, sides of capital tract; none on ventral or caudal tracts. Down grayish white, with darker, smoky-looking tips. Longest down 10 mm.

Day 2. Same as Day 1, except down of capital tract definitely in three parts: over each eye and on back of head; crural tract, row of down about 6 mm.

long; tibial tract, small tuft of down present at lower extremity. Down buff, marked partly with grayish black.

Day 3. Darkened juvenal feathers first visible in various tracts.

Day 4. Juvenal feathers of dorsal tract, also primaries and secondaries of wing have come through skin.

Day 5. Juvenal feathers of ventral tract just breaking through skin.

Day 6. Juvenal feathers of ventral tract out 2 mm.

Day 9. Dorsal tract; feathers 12 mm. long (7 mm. out of sheath; ventral tract: feathers about 9 mm. (almost out of sheath for whole length); down still present except on ventral tract, where probably removed by wriggling in nest.

Day 10. (Date of leaving nest.) Dorsal tract: plumage has become quite brownish; feathers on middle point of dorsal tract roughly 14 mm. long (10–12 mm. out of sheath); a little down still present; ventral tract buffy, feathers about 12–14 mm. long (9 mm. out of sheath). A little down still present on innermost secondaries.

Skin

Day 1. In general, pinkish orange.

Days 2–5. Noticeably darker each day. On Day 2, much of the pinkish color was lost.

Inside of Throat

Red-brown on Days 2 and 3.

Day 3. Some yellowish color appearing. Beginning to get blue on tip.

Egg tooth noticeable on Day 1; still present on Day 5.

Eyes

Closed on Day 1; partly open, Days 2–5; fully open, Day 6.

Length of Hind Claw

Day 4, 2 mm.; Day 6, 3+ mm.; Day 10, 6 mm.

Feces

Day 9. Becoming darker; weight, nearly 6 gms.

Activities

Day 4. For first time able to sit up on tarsi, after having been turned over on back. Uttered a clicking sound with every breath. They were also heard to squeak when fed.

Days 5–6. On approach of parent to nest, heads and open mouths of five nestlings shot up. They uttered an indistinct, high-pitched *ch-ch.*

Day 7. Vigorous; struggled when handled; tried to get out of box.

Day 9. Showed signs of fear; backed up when handled.

Day 10. Mosquitoes thick; nestlings hopping up and down and vainly shaking heads to shake off mosquitoes, which alighted on corners of gape and around eyes. Apteria on back between dorsal and alar tracts appeared inflamed, perhaps from mosquito bites.

DAILY GROWTH OF NESTLINGS

A table shows the daily growth of the nestlings. Five different individuals were measured at various times, although not always all five on each day. Daily increase of weight shows no characteristic

AVERAGE DAILY GROWTH OF LAPLAND LONGSPUR NESTLINGS

	Length (mm.)								*Wt. (gm.)*	
	Total Length		*Wing*	*Tail*		*Sheathed primary (av.)*		*Tarsus to middle toe*	*Av.*	*Av. incr.*
Day	*Av.*	*Av. incr.*	*(av.)*	*Tot.*	*L. out of sheath*	*Tot.*	*L. out of sheath*			
1	37	—	7+	—	—	—	—	11	2.6	—
2	44	7	9½	—	—	—	—	13	4.0	1.4
3	50	6	10.7	—	—	1+	—	20	5.9	1.9
4	55+	5	11	—	—	—	—	22.5	7.9	2.0
5	67	12	15	—	—	2	—	28.5	9.9	2.0
6	70.5	2.5	19.7	—	—	3+	—	32.5	13.2	3.3
7	78.5	8	24.0	—	—	8	—	35	16.0	2.8
8	87	—	31.0	5	1	17	1	38	19.8	—
9	86.5	—	38.5	8	6	21.5	6	40.5	19.7	—

tendency but is irregular, whereas average weight increased progressively up to Day 6. Weight analyses for the last two days are misleading because a different brood was weighed; the brood previously measured had prematurely disappeared.

Measurements of testes and weights of three adult Lapland Longspurs and two Smith's Longspurs collected were as follows:

		Dia. of Testes				
		Length		*Width*		*Weight*
	Date Collected	*L.*	*R.*	*L.*	*R.*	*of bird*
Lapland Longspur:	June 22, 1940	8 mm.	9	6	7.5	27.7 gm.
	June 22, 1940	11.5	9	8	8	30.2
	June 28, 1940	11	10	7	8	27.9
	July 19, 1940	Unrecognizable		(injured)		30.0
	Average	9.7		7.4		28.95
Smith's Longspurs:	June 28, 1940	13.5	11	10	9	29.5
	July 19, 1940	—	—	—	—	26.4
	July 19, 1940	5	4	3.5	3.5	28.7
	Average	9.25	7.5	6.75	6.25	28.2

Stomach analyses of nine Lapland Longspurs and three Smith's Longspurs collected between June 22 and July 19 gave the following results:

Lapland Longspur.—

Animal matter:	INSECTA	DIPTERA	TIPULIDAE	
		LEPIDOPTERA	PIERIDAE	
		COLEOPTERA	CURCULIONIDAE	
		COLEOPTERA	— — —	(beetle wing)
	GASTROPODA	— — —	— — —	small snail
Vegetable matter:	(Moss capsules and leaf remains)			
	(Seeds of *Carex* and *Draba*)			
	(Unidentifiable seeds)			
Mineral matter:	(Traces of gravel)			

Smith's Longspur.—

Animal matter:	INSECTA	HETEROPTERA	SALDIDAE	
		COLEOPTERA	CARABIDAE	
		COLEOPTERA	STAPHYLINIDAE	
		COLEOPTERA	CHRYSOMELIDAE	
		COLEOPTERA	CANTHARIDAE	(*Podabrus*)
		HYMENOPTERA	TENTHREDINIDAE	
	ARACHNOIDEA	ARANEIDA	LYCOSIDAE	
		ACARINA	— — —	(Mites)
Vegetable matter:	(Moss capsules and leaf remains)			
Mineral matter:	(Traces of gravel)			

Ithaca
New York

THE EFFECT OF TREE REMOVAL ON A MOURNING DOVE POPULATION

BY H. ELLIOTT MCCLURE

Plate 26

DURING the course of observations on the Mourning Dove in southwestern Iowa, it became evident that certain individual trees or groups of trees within the town of Lewis and nearby farmyards were preferred as nesting sites by the birds. These trees were so consistently used year after year that the term "patron trees" is suggested for them. Although the Mourning Dove is not necessarily gregarious in its nesting habits, some trees are so desirable as nesting sites that many pairs will use them. The birds' territorial demands are elastic enough that they submit to crowding to the point that sometimes there are as many as seven active nests in a tree. The upper figure in the accompanying photographs (Plate 26) shows a group of red pine, *Pinus resinosa,* near Lewis and the lower figure shows a group of one Norway spruce, *Picea abies,* two blue spruce, *Picea pungens,* four apples, *Pyrus malus,* one large American elm, *Ulmus americana,* and several other trees on a private property within