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ATLAS OF UNITED STATES TREES

Volume 6. Supplement

by Elbert L. Little, Jr.



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ATLAS OF UNITED STATES TREES

Volume 6. Supplement

by

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1981. Atlas of United States trees. Volume 6.

Supplement.

U.S. Dep. Agric. Misc. Publ. 1410, 31 p., 39 maps.

"Atlas of United States Trees" (1971-81) in 6 volumes has maps showing the natural range of the native tree species of the continental United States. Together, there are 1,244 maps, or 1,081 pages of maps, including 53 general and base maps. Volume 6 adds maps for 35 *Crataegus* (hawthorn) species and 1 additional species, *Juniperus erythrocarpa*.

The number of tree species native in continental United States as defined and mapped here, is about 684. Totals include: conifers, 95 (and also 2 shrub species); monocotyledons, 22; and hardwoods (dicotyledons), about 567. Also charted are the Alaskan ranges of 41 other species of common shrubs. Additional occurrence beyond the limits of the United States maps is plotted on 173 maps of North America. Volume 6 has indexes of common names and scientific names of all species maps in Volumes 1-6.

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12	Hydrology
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14	Mean annual snowfall
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- 2-N North America. Base map with names of States of the United States, Provinces and other subdivisions of Canada, States of Mexico, and names of additional countries.
- 3 United States (contiguous), National Forest System with names of National Forests and National Grasslands.

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Volume 6. Supplement

Base Maps

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Map No.

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- 8 *Crataegus columbiana*, Columbia hawthorn
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- 10 *Crataegus crus-galli* L., cockspur hawthorn
- 11 *Crataegus dilatata* Sarg., broadleaf hawthorn
- 12 *Crataegus douglasii* Lindl., black hawthorn
- 13 *Crataegus erythropoda* Ashe, Cerro hawthorn
- 14 *Crataegus flabellata* (Bosc) K. Koch, fanleaf hawthorn

ATLAS OF UNITED STATES TREES

Volume 6. Supplement

INTRODUCTION

Volume 6, Supplement, contains additional information to aid use of the five volumes of maps of the native trees of continental United States. New small maps of the eastern species of *Crataegus*, hawthorn, fill an omission of Volumes 4 and 5. A list of the 53 general and base maps is included. Finally, the indexes of common names and scientific names contain all species maps in Volumes 1-6.

This Supplement brings to a close the project of preparing a distribution map for each native species in continental United States. The history of tree distribution maps has been reviewed in the introductions of previous volumes and in an earlier article (Little 1951).¹ George B. Sudworth (1864-1927) was the dendrologist, or tree identification specialist, in charge of the dendrology project of the Division (later Bureau) of Forestry and the Forest Service, U.S. Department of Agriculture, from 1886 until his death nearly 41 years later.

Soon after establishment of the Forest Service in 1905, Sudworth (1913) undertook this mapping project but published only the first part: "Forest atlas. Geographic distribution of North American trees. Part I. Pines," a folio volume with large maps of the 36 native species of the genus *Pinus*. It is unfortunate that the entire atlas was not published soon afterwards, when the maps for each species represented current knowledge. Some smaller maps of conifers, poplars, tree willows, and walnuts of the Rocky Mountain regions appeared in 5 later bulletins by Sudworth, the last completed after Sudworth's death by William A. Dayton. However, most of the maps remained unpublished after Sudworth's death, and no successor was appointed. Some years later, Munns (1938) published distribution maps of 170 important forest tree species of the United States, based largely upon data collected by Sudworth.

The present compiler has continued and expanded the mapping project to complete this 6-volume Atlas. He began research work with the Forest Service in 1934 and was the dendrologist in Washington, D.C., from 1942 until his retirement in 1975. A few months later he returned for a year under a temporary appointment and continued as a volunteer through 1978.

This 6-volume Atlas was preceded by a Yearbook of Agriculture article with 165 small maps (Little 1949, also reprinted separately in

1950), by "Silvics of Forest Trees of the United States" (Fowells 1965) with 124 maps by Little, and by "Geographic Distribution of the Pines of the World" (Critchfield and Little 1966) with maps of 18 additional native species of pines.

For assistance in preparing and drafting the maps of the Supplement, credit is due Barbara H. Honkala, research botanist, who also made the cover design.

The 5 volumes with explanatory titles are cited in full under Selected References (Little 1971, 1976, 1977, 1978a; Viereck and Little 1975). They are United States Department of Agriculture Miscellaneous Publications Nos. 1146, 1293, 1314, 1342, and 1361. Volume 6, Supplement is 1410. All have been printed by the United States Government Printing Office, Washington, D.C., and are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Each volume contains an introduction. Subjects discussed include history of tree distribution maps, preparation of the maps, explanation of the maps, tree names, notes on ranges, rare and local species, applications of the maps, and selected references. Also, each volume has indexes of scientific names and common names and a list of maps under Contents.

Several other Forest Service publications devoted to tree species distribution maps should be mentioned. The Forest Survey published maps of commercial forest trees in four Southeastern States: Mississippi (Sternitzke and Duerr 1950), North Carolina and South Carolina (Roberts and Cruikshank 1941a, 1941b), and Virginia (Evans 1942). "The Distribution of Forest Trees in California," by James R. Griffin and William B. Critchfield (1972, revised 1976), has detailed maps of 86 species in that State. "Important Forest Trees of the United States" (Little 1978b) contains maps of 180 species. These maps are reductions of those in the Atlas.

Many other publications containing distribution maps of native trees of continental United States have been cited elsewhere (Little and Honkala 1976; Little 1979). These include taxonomic monographs, State tree handbooks, and State floras.

¹ Names and dates in parentheses refer to Selected References, p. 5.

GENERAL AND BASE MAPS, VOLUMES 1-6

Lists of General and Base Maps (following Contents) in the 6 volumes of the Atlas, totaling 62, are self-explanatory. All volumes display a map of North America. Volumes 1, 3, 4, and 5 contain maps of part of the United States with names of counties. Volumes 1, 3, 4, and 6 have a map of the United States (contiguous) with names of National Forests and National Grasslands.

Volume 1 has 9 transparent 2-page folded overlay maps of the United States that illustrate special details of the environment, including geography, climate, and forest types. These maps are equally useful for Volumes 3 and 4, and the scale remains the same though the size of pages and maps has been trimmed. The overlays can easily be adapted to the later volumes by tracing boundaries of a few key States in pencil and by making new corners.

The same base map of the United States (contiguous), scale 1:10,000,000, has been used in Volumes 1, 3, 4, and 5. It is Albers Conical Equal Area Projection—standard parallels 29½° and 45½°, showing State and county boundaries; also latitude and longitude marked by crosses at 5-degree intervals. The maps of Alaska in Volume 2 have the same scale. The scale for the 35 small maps of *Crataegus*, hawthorn, is 1:30,000,000. The 98 maps in Volume 5 of tropical hardwoods confined mostly to southern Florida have a scale of roughly 1:4,000,000.

Several base maps and many species maps add letters of compass direction after the number. In Volume 1, maps are further labeled according to whether they show the eastern (E) or western (W) United States. Volumes 3 and 4 have 2 maps for each species with great range from north to south. These are indicated in Volume 3 (Western) as northwestern (NW) and southwestern (SW); in Volume 4 (Eastern) as northeastern (NE) and southeastern (SE).

A second or third base map, North America (designated by N), (scale roughly 1:27,000,000) is added in Volumes 1, 3, and 4 for the species whose natural range extends beyond the limits of the first base map.

ADDITIONS

Besides *Crataegus*, hawthorn, Volume 6 has an addition: map 36, *Juniperus erythrocarpa* Cory, redberry juniper. This species named in 1936 has been accepted in a recent study of the genus (Zanoni 1978).

Three shrub species of the Pacific Coast region that rarely attain tree size were added to the 1979 Checklist, though not mapped. They are: *Adenostoma sparsifolium* Torr., redshank. Range—Mts. of s. Calif. and n. B. Cal., Mex.

Arctostaphylos glauca Lindl., bigberry manzanita. Range—Mts., Coast Ranges mostly, of c. and s. Calif. Also in n. B. Cal., Mex.

Arctostaphylos viscida Parry, whiteleaf manzanita. Range—Foot-hills of sw. Oreg. and s. in Coast Ranges and Sierra Nev. to c. Calif.

Minor extensions and revisions have been made in the text ranges published in the 1979 Checklist. However, the maps of previous volumes have not been revised or redrafted.

TREE NAMES

Scientific names and common names in the Atlas agree with the later Forest Service Checklist (Little 1979), with few exceptions. Each volume lists changes made after the earlier Check List (Little 1953). The 1979 Checklist also contains revisions in common names approved by the Forest Service Tree and Range Name Committee.

Other scientific names in use for the native tree species of continental United States not found in the indexes of this volume may be sought in the 1979 Checklist. That reference, which contains synonyms

and other common names, will serve to correlate names that are in use but were omitted from the Atlas.

Several scientific names of species in Volumes 2, 3, and 4 have been revised in the 1979 Checklist, as summarized below.

Amelanchier interior Nielsen, inland serviceberry (vol. 4, map 13), is intermediate between *A. arborea* and *A. sanguinea* and perhaps should be regarded as a hybrid.

Cecidium texanum Gray, Texas paloverde, includes *C. macrum* Johnst., border paloverde (vol. 3, map 36).

Heteromeles arbutifolia (Lindl.) M. H. Roem., toyon, replaces *Photinia arbutifolia* Lindl., Christmas-berry (vol. 3, maps 109-NW, 109-SW).

Malus fusca (Raf.) Schneid., Oregon crab apple, replaces *M. diversifolia* (Bong.) Roem. (vol. 2, map 49; vol. 3, maps 100-N, 100-W).

Populus fremontii var. *mesetae* (Eckenwalder) Little, meseta cottonwood, replaces *P. arizonica* Sarg. (vol. 3, map 115).

Populus hinckleyana Correll, Hinckley cottonwood, (vol. 3, map 116), has been reduced to the hybrid *Populus angustifolia* × *fremontii*.

Prosopis juliflora (Sw.) D.C., mesquite (vol. 3, maps 118-N, 118-SW), as now defined, is native from Mexico southward. The 2 native species mapped together as varieties under that name are *P. glandulosa* Torr., honey mesquite, and *P. velutina* Woot., velvet mesquite.

Quercus ajoensis C. H. Muller, Ajo oak (vol. 3, map 130), has been reduced to a variety, *Q. turbinella* var. *ajoensis* (C. H. Muller) Little.

Salix bonplandiana H.B.K. Bonpland willow (vol. 3, maps 166-N, 166-SW), includes as a synonym *S. laevigata* Bebb, red willow (vol. 3, map 176).

Salix exigua Nutt., sandbar willow (coyote willow) (vol. 3, maps 168-NW, 168-SW, 168-N; vol. 4, maps 129-NE, 129-SE, 129-N), includes as a synonym *S. interior* Rowlee, sandbar willow (vol. 2, map 24).

Salix myrtilifolia Anderss., tall blueberry willow, replaces *S. novae-angliae* Anderss. (vol. 2, map 28).

Salix richardsonii Hook., Richardson willow, replaces *S. lanata* L. ssp. *richardsonii* (Hook.) A. Skwartz. (vol. 2, map 25).

Sambucus cerulea Raf., blue elder, replaces *S. glauca* Nutt., blueberry elder (vol. 3, maps 185-NW, 185-SW).

Yucca schidigera Roez. ex Ortgies, Mohave yucca, replaces *Y. mohavensis* Sarg. (vol. 3, map 206).

CRATAEGUS, HAWTHORN

Thirty-five species of *Crataegus*, hawthorn, have been accepted in the 1979 Checklist (Little 1979, p. 101-118) as native in continental United States and are represented by small maps in this Supplement. Seven western species were included in Volume 3 (maps 57-63). However, the eastern species and eastern ranges of 2 western species were omitted from Volume 4 because of taxonomic difficulties. The drastic reduction from 150 species in the 1953 Check List to 35 in the 1979 Checklist is explained in the 1979 Checklist, pages 101-105.

Some States have published or unpublished maps of their species but with differing interpretations and synonymy. Thus, this genus was omitted in the compilation of records State by State, and no attempt has been made to plot range limits in detail.

Two very recent publications should be noted. In his field guide to North American trees, Elias (1960) described and illustrated in the genus *Crataegus* only 26 species (including 1 introduced) and prepared small maps of 18. Phipps and Muniyamina (1980) in a detailed revision for Ontario, Canada, accepted and mapped 39 "good" species (including 1 naturalized and 1 of its hybrids).

The 35 small black-and-white maps (scale 1:30,000,000) show general distribution by a dot in each State. Where the range is limited, the dot

indicates roughly the part of a State. Dots have been added also for the District of Columbia, Provinces of Canada, and States of Mexico. Text ranges for each species have been added from the 1979 Checklist.

TEXT RANGES

Text ranges, summaries or outlines in words for reference or quotation, are available in the 1979 Checklist for each tree species mapped in the Atlas. Also, Volumes 2, 4, and 5 contain this information for their species. Text ranges for the 36 species mapped here in Volume 6 are listed below for convenient reference. A few have been revised slightly from the 1979 Checklist.

1. *Crataegus aestivalis* (Walt.) Torr. & Gray, May hawthorn. Coastal Plain from s. N.C. sw. to n. and nw. Fla., s. Ala., and s. Miss.

2. *Crataegus berberifolia* Torr. & Gray, barberry hawthorn. Miss. Valley region from s. Ill. w. to sw. Kans., s. to n. c. and e. Tex., e. to Miss., and n. to w. Ky.

3. *Crataegus brachyacantha* Sarg. & Engelm., blueberry hawthorn. Coastal Plain in sw. Ga., Ala., La., sw. Ark., extreme se. Okla., and e. Tex.

4. *Crataegus brainerdii* Sarg., Brainerd hawthorn. N.S., Maine, and s. Que., w. to s. Ont. and Mich., s. to Ohio, and e. to Pa., N.Y., and Conn. Recorded from mts. of w. N.C.

5. *Crataegus chrysoarpa* Ashe, fireberry hawthorn, Nfld., N.S., Que., and Maine, w. to Ont., Sask., and Alta., s. in mts. to Mont., ne. Wyo., and n. Colo., also from S. Dak. and Minn. s. to Mo., e. to W. Va. and Va., and n. to Pa., N.Y., and Mass.

6. *Crataegus calpodendron* (Ehrh.) Medic., pear hawthorn. N.Y. and s. Ont., w. to Wis. and Minn., s. to Iowa, se. Nebr., and e. Tex., e. to Ga., and n. to w. N.C., Va., and N.J.

7. *Crataegus coccinea* L., scarlet hawthorn. Maine, s. Que., and s. Ont., w. to Mich., Wis., and se. Minn., s. to Iowa and Ill., and e. to Ind., n. Ky., W. Va., Pa., and N.Y. Also local s. in mts. of w. Va. and w. N.C.

8. *Crataegus columbiana* Howell, Columbia hawthorn. From extreme sw. Sask. (Cypress Hills) w. to c. B.C., s. to Oreg. and s. Mont.

9. *Crataegus coccinioides* Ashe, Kansas hawthorn. S. Ill., Mo., se. Kans., ne. Okla., and n. Ark.

10. *Crataegus crus-galli* L., cockspur hawthorn. S. Que., Vt., and s. Ont., w. to s. Mich., s. Wis., and Iowa, s. to e. Kans. and n. c. and e. Tex., e. to n. Fla. and Ga., and n. to Mass. Introduced ne. to Maine.

11. *Crataegus dilatata* Sarg., broadleaf hawthorn. S. Que. and s. Ont. s. to N.Y., Vt., N.H., Mass., Conn., and R.I.

12. *Crataegus douglasii* Lindl., black hawthorn. Local in s. and se. Alaska, from B.C. s. to c. Calif., e. mostly in mts. to N. Mex., and extreme nw. Tex., and n. to e. Mont. and s. Sask. Also local near Lake Superior in ne. Minn., n. Mich., and Ont.

13. *Crataegus erythropoda* Ashe, Cerro hawthorn. Mts. of s. Wyo., c. and w. Colo., n. N. Mex., and c. Ariz.

14. *Crataegus flabellata* (Bosc) K. Koch, fanleaf hawthorn. Nfld., N.S., s. Que., and Maine, w. to s. Ont., Mich., and Minn., s. to Ill. and La., and e. to Ga.

15. *Crataegus greggiana* Eggl., Gregg hawthorn. C. Tex. (Edwards Plateau) s. to ne. Mex. (Coah., N.L.).

16. *Crataegus flava* Ait., yellow hawthorn. Va. sw. to n. Fla., Miss., and e. Tenn.

17. *Crataegus harbisonii* Beadle, Harbison hawthorn. Tenn., Ala., and Miss.

18. *Crataegus intricata* Lange, Biltmore hawthorn. N.H. and Vt., w. to s. Ont. and s. Mich., s. to Mo., Ark., and se. Okla., and e. to Ga. and N.C.

19. *Crataegus lacrimata* Small, Pensacola hawthorn. Nw. Fla.

(Walton to Escambia Co.).

20. *Crataegus marshallii* Eggl., parsley hawthorn. Coastal Plain mostly, from se. Va. s. to c. Fla. and w. to e. Tex., and n. in Miss. Valley to se. Okla., se. Mo., and w. Tenn.

21. *Crataegus mollis* Scheele, downy hawthorn. N.S., s. Que., and Maine, w. to s. Ont., n. Mich., Minn., and se. N. Dak., s. to s. c. Tex., e. to Ala., and n. to W. Va. and N.Y.

22. *Crataegus opaca* Hook. & Arn., riverflat hawthorn. Coastal Plain of sw. Ala., Miss., La., s. Ark., and e. Tex.

23. *Crataegus phaenopyrum* (L. f.) Medic., Washington hawthorn. Va. w. to Ky., s. Ill., and s. Mo., s. to Ark., and e. to Ala., n. Fla., and S.C. Local n. to s. Ohio. Planted and escaped from Md. ne. to Mass. and naturalized locally.

24. *Crataegus pruinosa* (H. L. Wendl.) K. Koch, frosted hawthorn. S. Que. and sw. Maine, w. to s. Ont., n. Mich., and Wis., s. to se. Iowa, se. Kans., and e. Okla., and e. to Ark., Tenn., and N.C.

25. *Crataegus pulcherrima* Ashe, beautiful hawthorn. Sw. Ga., n. Fla., and s. Ala.

26. *Crataegus punctata* Jacq., dotted hawthorn. S. Que. and N.H., w. to s. Ont., n. and s. Mich., and e. Minn., s. to Mo., sw. Kans., and e. Okla., and e. to Ark., Ga., and S.C.

27. *Crataegus saligna* Greene, willow hawthorn. Mts. of w. Colo. only.

28. *Crataegus reverchonii* Sarg. Reverchon hawthorn. S. Mo. and se. Kans., s. to sw. Okla., c. Tex., and Ark.

29. *Crataegus spathulata* Michx., littlehip hawthorn. Va. w. to Tenn. and s. Mo., s. to se. Okla. and e. Tex., and e. to n. Fla.

30. *Crataegus texana* Buckl., Texas hawthorn. Se. and s. Tex., mostly near coast.

31. *Crataegus succulenta* Schard., fleshy hawthorn. N.S., P.E.I., s. Que., and Maine, w. to Ont., n. Mich., Minn., s. Man., and w. N. Dak., s. to Nebr. and Mo., e. to Tenn. and w. N.C., and n. to W. Va., Pa., and N.J. Also local in mts. of s. Most., Wyo., Colo., and n. Utah and in Kans.

32. *Crataegus tracyi* Ashe, Tracy hawthorn. C. Tex. (Edwards Plateau), Trans-Pecos Tex., and n. Coah., Mex. (Sierra del Carmen).

33. *Crataegus triflora* Chapm., threeflower hawthorn. Ga., Ala., and Miss.

34. *Crataegus uniflora* Muenchh., oneflower hawthorn. N.Y. (Long Is.), N.J., and se. Pa., w. to s. Ohio, Ky., and s. Mo. s. to e. Okla. and e. Tex., and e. to n. Fla.

35. *Crataegus viridis* L., green hawthorn. Coastal Plain mostly, from Del., se. Md., and se. Va., s. to n. Fla., w. to e. Tex., and n. in Miss. Valley to e. Okla., se. Kans., Mo., s. Ill., and sw. Ind.

36. *Juniperus erythrocarpa* Cory, redberry juniper. Trans-Pecos Tex., s. N. Mex., and s. Ariz. Also in n. Mex. (Son. to Dgo., Zac., and Tamps.). (Part of the northern range formerly was mapped under *Juniperus monosperma* (Englem.) Sarg., oneseed juniper.)

FUTURE WORK

No further revision of the maps in "Atlas of United States Trees" is planned. However, interested specialists are encouraged to revise the tree species maps for their States and to add range extensions and corrections, particularly in those States lacking atlases or similar publications. Perhaps, future taxonomic monographers will compile detailed information on distribution.

In general, new data on tree species ranges may be sent to the State herbarium. Duplicate specimens confirming important records should be deposited in one or more large herbaria, as well as the herbarium of the State or institution. Summaries of noteworthy range extensions and other records merit publication.

Duplicate copies of notes and publications may be sent to the Forest Service for its map files, further reference, and possible future revision. Address: USDA Forest Service, Timber Management Research, P.O. Box 2417, Washington, DC 20013.

STATISTICAL SUMMARY OF THE ATLAS

"Atlas of United States Trees" in 6 volumes has maps compiled to show the natural range of the native tree species of continental United States. A statistical summary with numbers of species and maps follows.

"Volume 1, Conifers and Important Hardwoods" has 201 species, including 94 of conifers and 107 of hardwoods (also 2 shrub species of conifers). A map of North America is added for 67 species (also 2 shrub species of conifers). Also, 27 species (and 1 shrub species) have maps for both the Eastern and Western United States. There are 4 base maps and 9 transparent overlays, for a total of 313 maps (all black-and-white).

"Volume 2, Alaska Trees and Common Shrubs" has 38 tree species, including 6 shrub species of willow (*Salix*) that rarely reach tree size (also 44 more of common shrubs, making 82 species maps in color). It also has 23 general maps (8 in color) for a total of 105 maps. All Alaska tree species except 7 shrub species that rarely reach tree size are also in another volume.

"Volume 3, Minor Western Hardwoods" has 210 species. A map of North America is added for 62 species (including 2 Alaska species not native in the contiguous United States). Also, 15 species have both northeastern and southwestern maps. There are 4 base maps, for a total of 289 maps (all in color except base maps).

"Volume 4, Minor Eastern Hardwoods" has 166 species (including 19 also in Volume 3). A map of North America is added for 42 species (including 12 also in Volume 3). Also, 18 species have both northeastern and southeastern maps. There are 4 base maps, for a total of 230 maps (all in color except base maps).

"Volume 5, Florida" has 262 species on 129 pages. There are large maps of this State for 98 species of tropical hardwoods confined mostly to the southern part (6 also in other States). This volume repeats the Florida portion (with a few maps slightly revised) of 170 species from Volume 1, 3, and 4 (mostly 6 to a page). Also, there are 6 general maps for a total of 268 maps (all in color except 4 general maps).

"Volume 6, Supplement" has small maps of 35 species of *Crataegus*, hawthorn; on 10 pages and 1 additional species (*Juniperus erythrocarpa*). Also, there are 3 base maps for a total of 39 maps (all black-and-white).

Together, the 6 volumes contain 1,244 maps, or 1,081 pages of maps, including 53 general and base maps.

So, the number of tree species native in continental United States, as defined and mapped here, is about 684. This number includes some shrub species rarely attaining tree size and often omitted from tree lists. Also counted are 98 species of tropical hardwoods, all but 6 of which are confined to southern Florida and are native in no other State.

Native conifers total 95 tree species (also 2 shrub species), all in Volume 1 except for 1 addition in Volume 6. The 22 species of monocotyledons that reach tree size are mapped with the hardwoods in Volumes 1, 3, 4, and 5. The palm family, *Palmae*, has 11 native species of palms (1 southwestern and 10 southeastern). Tree-size yuccas, genus *Yucca*, total 11 (9 southwestern and 2 southeastern). So, as compiled in this atlas, about 567 species are hardwoods (dicotyledons). Also charted are the Alaska ranges of 41 other species of common shrubs.

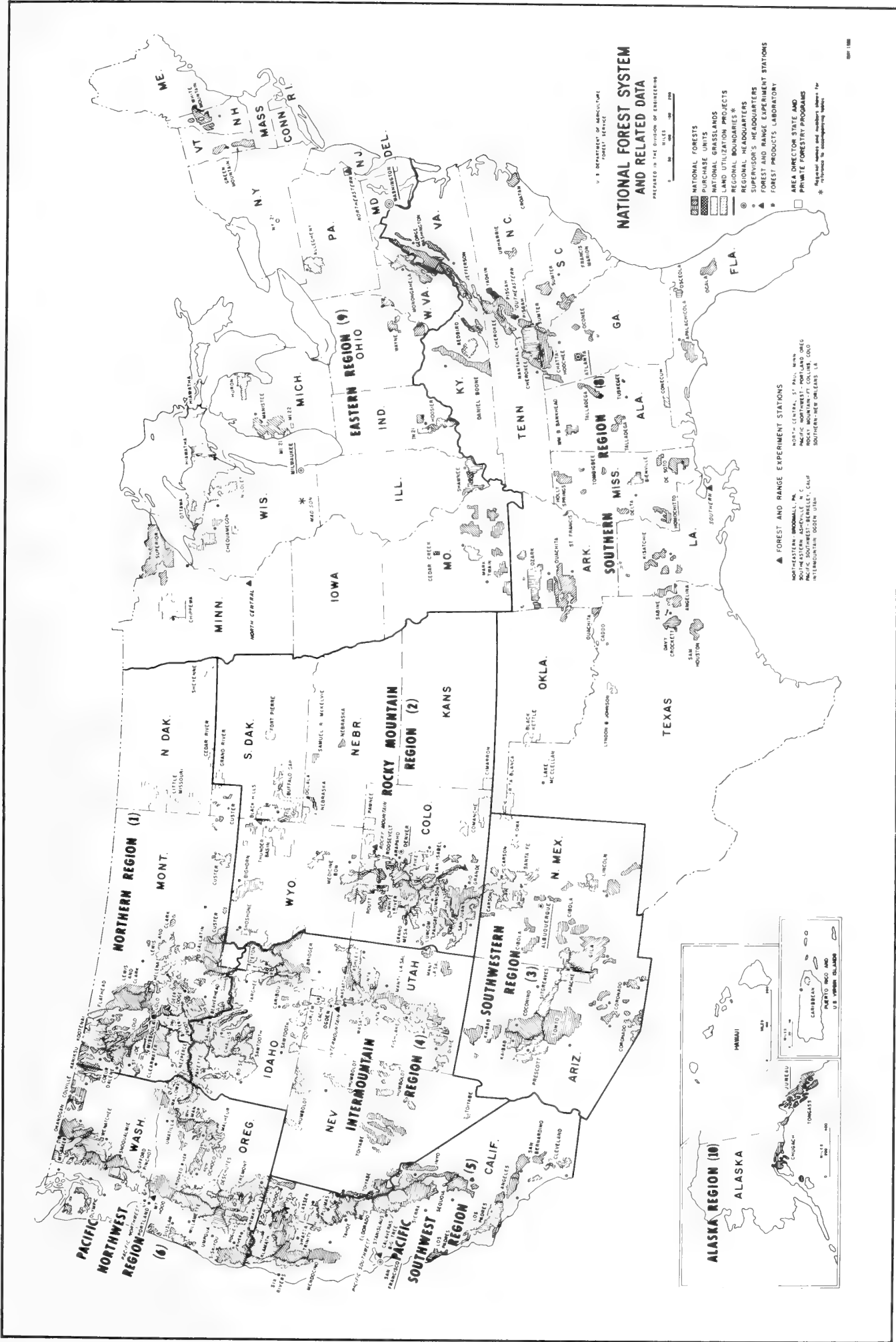
Volume 6 has indexes of common names and scientific names of all species maps in Volumes 1-6.

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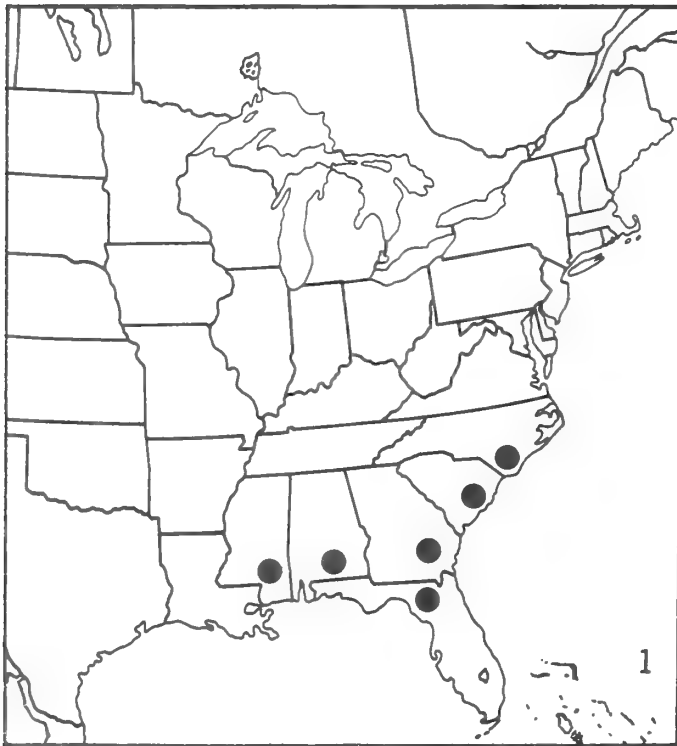
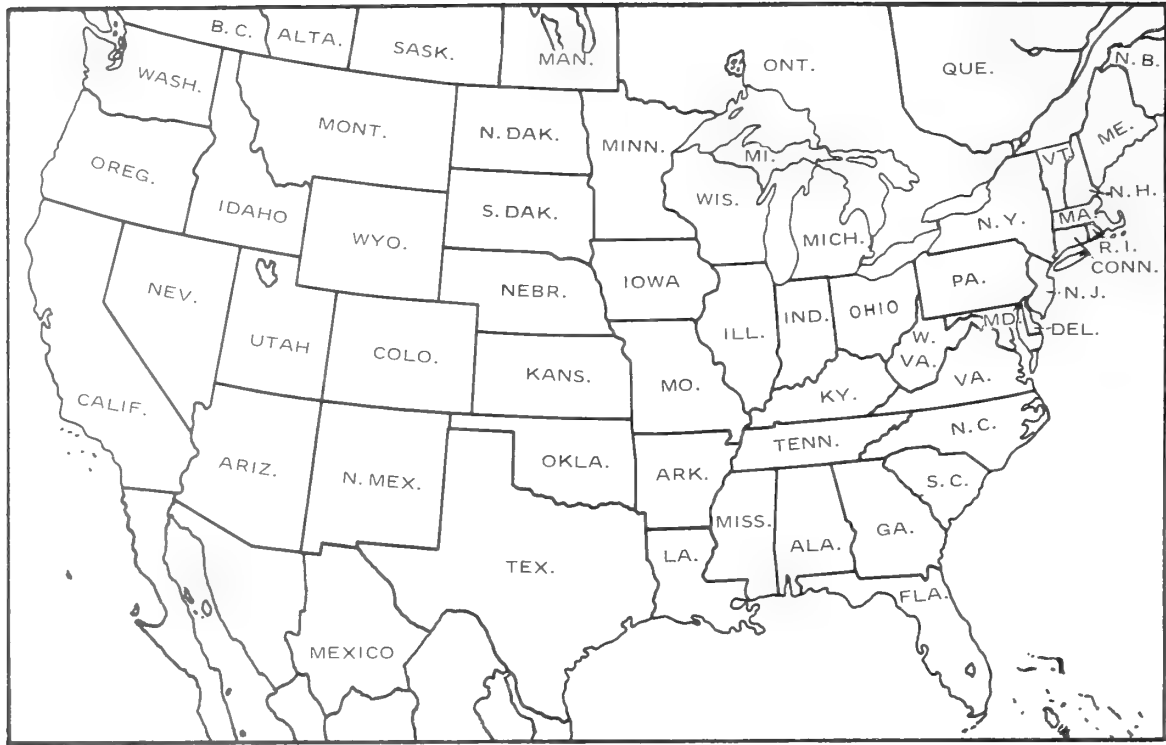
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Base Map 1.—North America. Base map with names of States of the United States, Provinces and other subdivisions of Canada, States of Mexico, and names of additional countries.

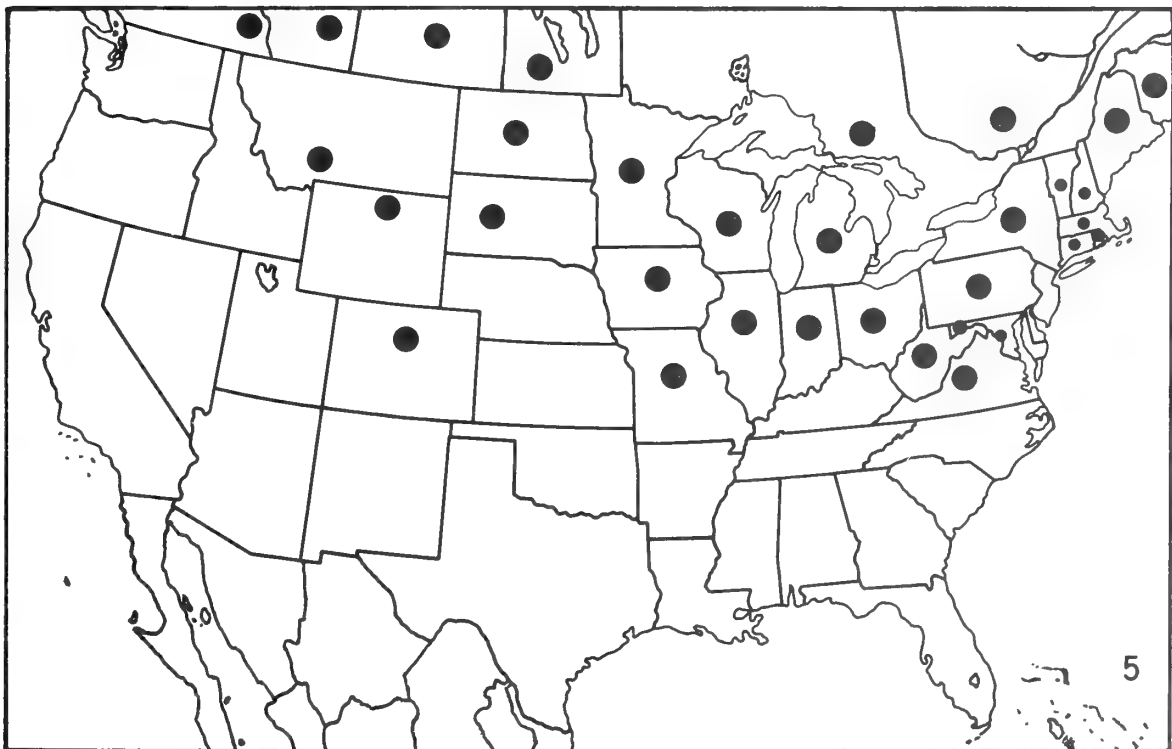
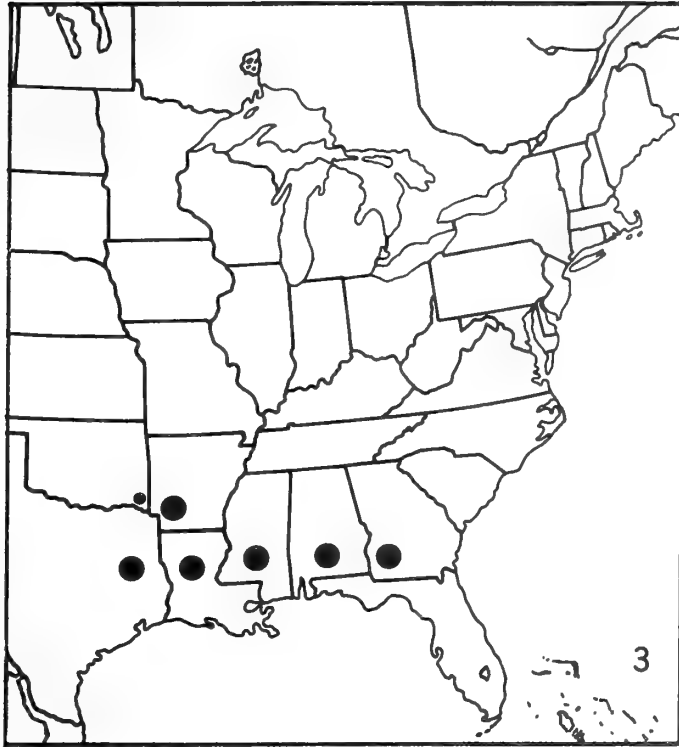


Base Map 2.—United States (contiguous), National Forest System, with names of National Forests and National Grasslands.

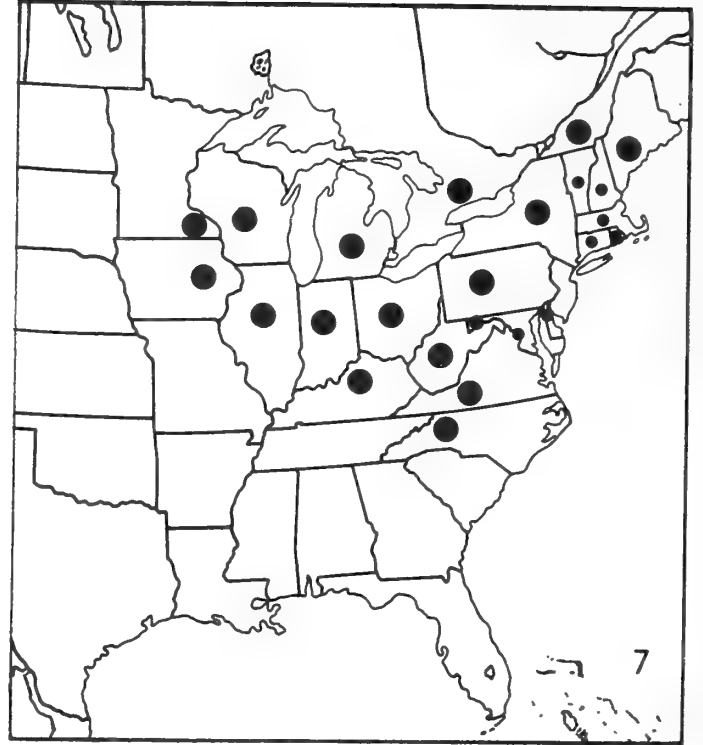
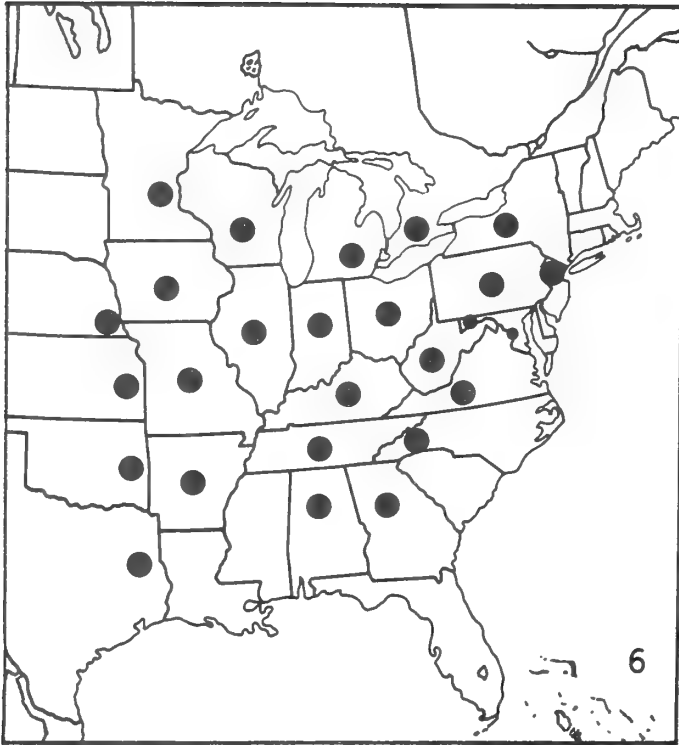


Base Map 3.—United States (contiguous). Base map with names of States.

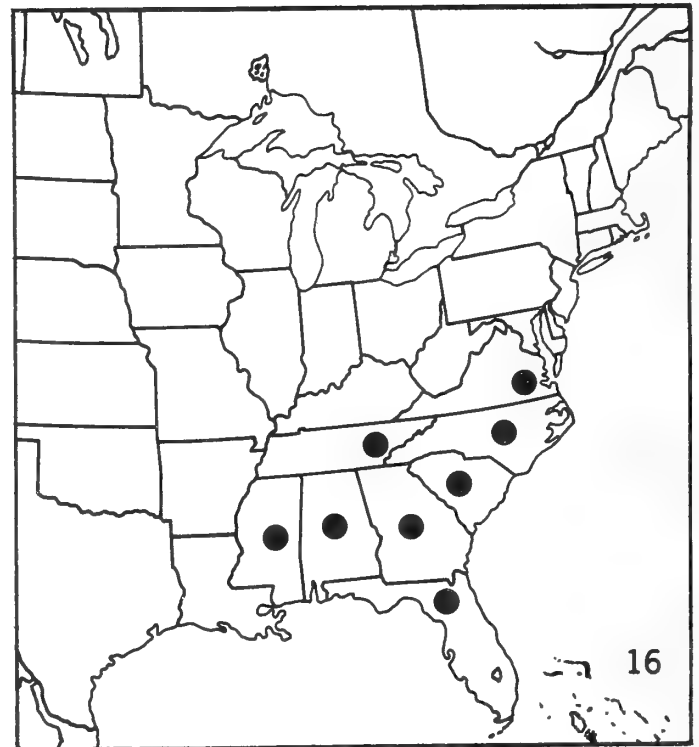
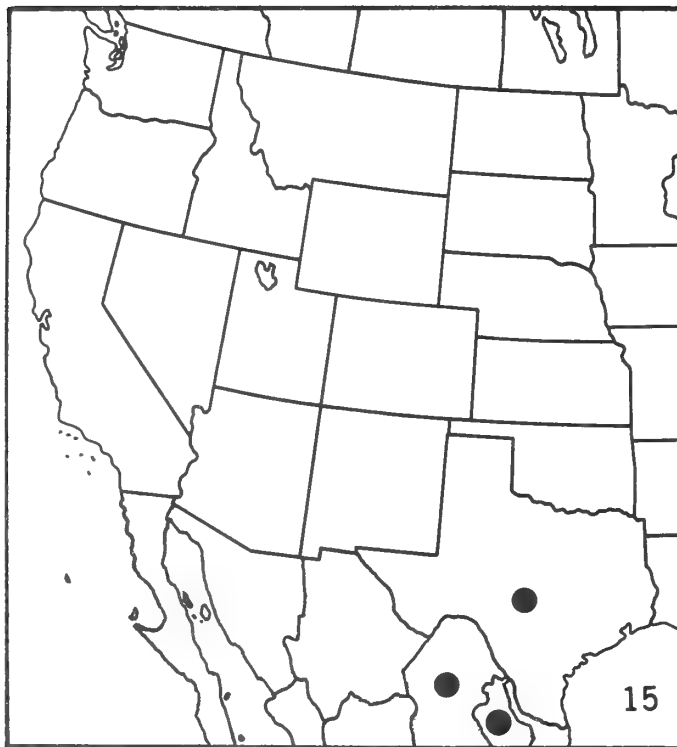
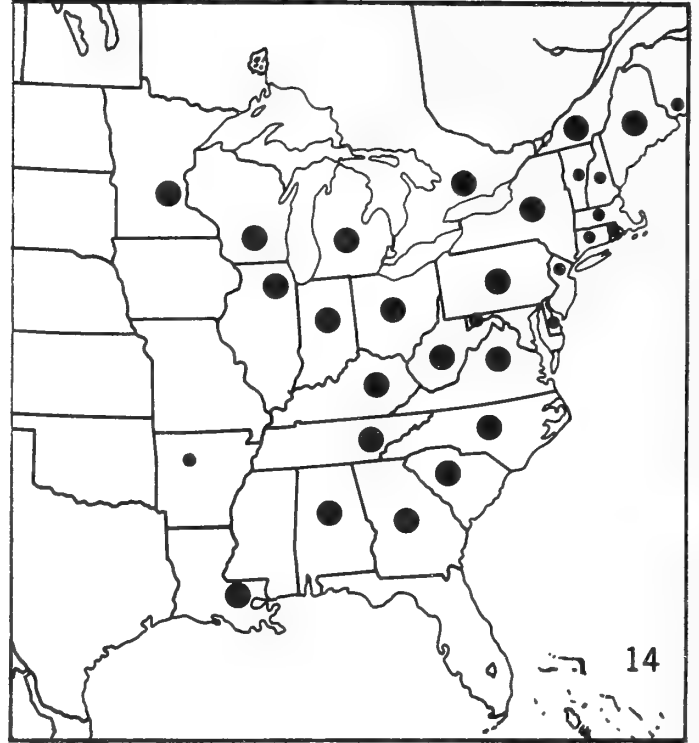
Map 1.—*Crataegus aestivalis* (Walt.) Torr. & Gray, May hawthorn. Map 2.—*Crataegus berberifolia* Torr. & Gray, barberry hawthorn.



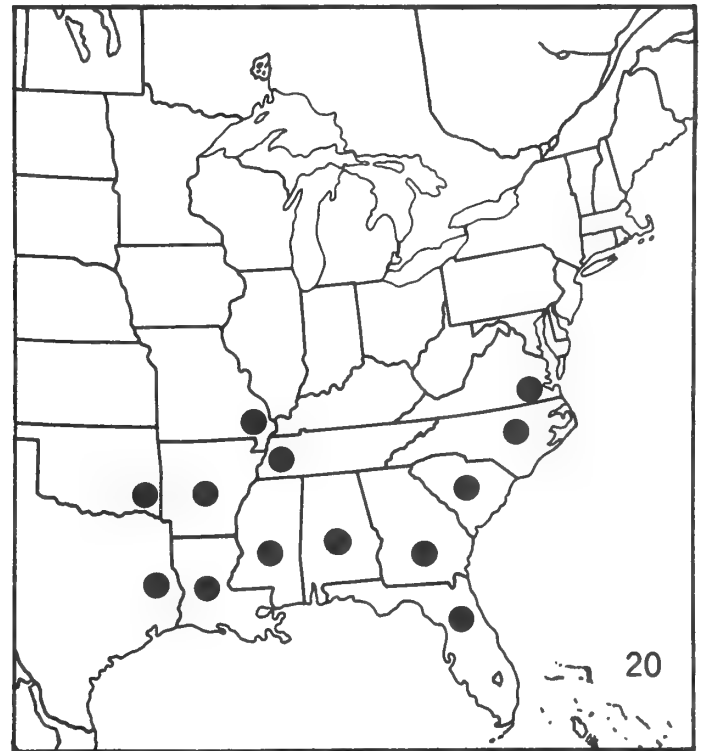
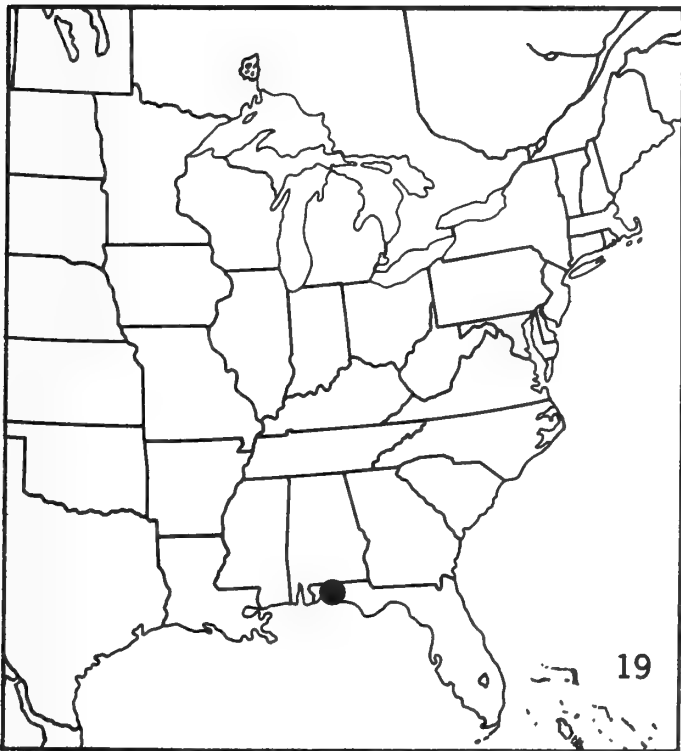
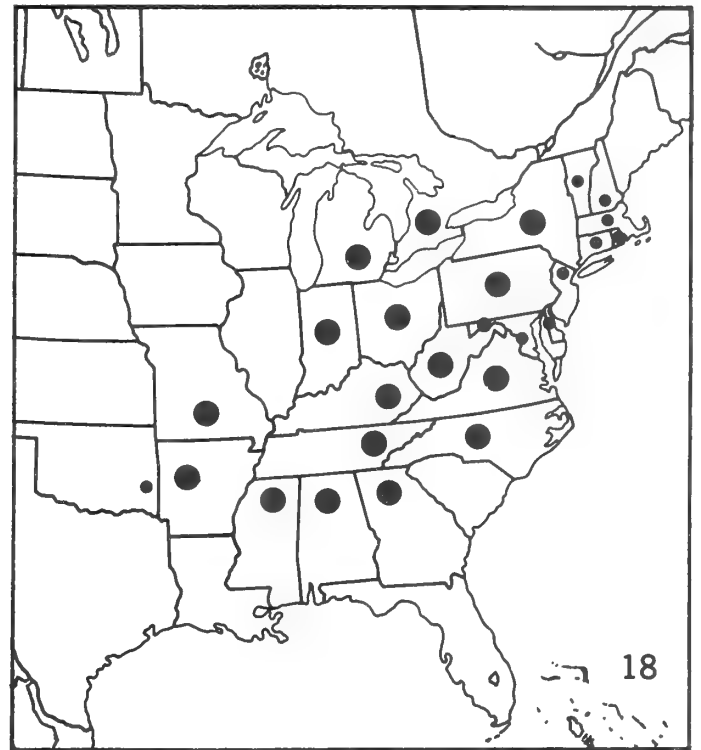
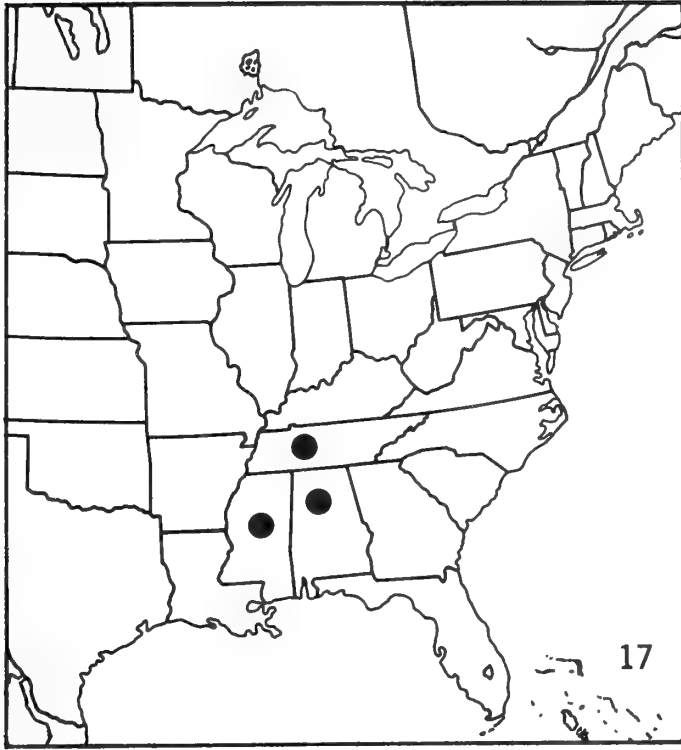
Map 3.—*Crataegus brachyacantha* Sarg. & Engelm., blueberry hawthorn. Map 4.—*Crataegus brainerdii* Sarg., Brainerd hawthorn. Also N.S. Map 5.—*Crataegus chrysocarpa* Ashe, fireberry hawthorn. Also N.S., P.E.I., and Nfld.



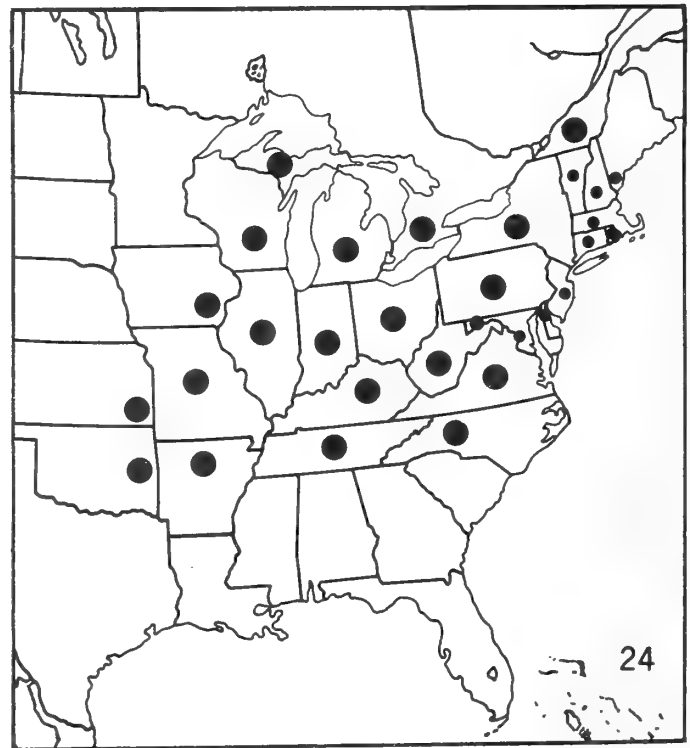
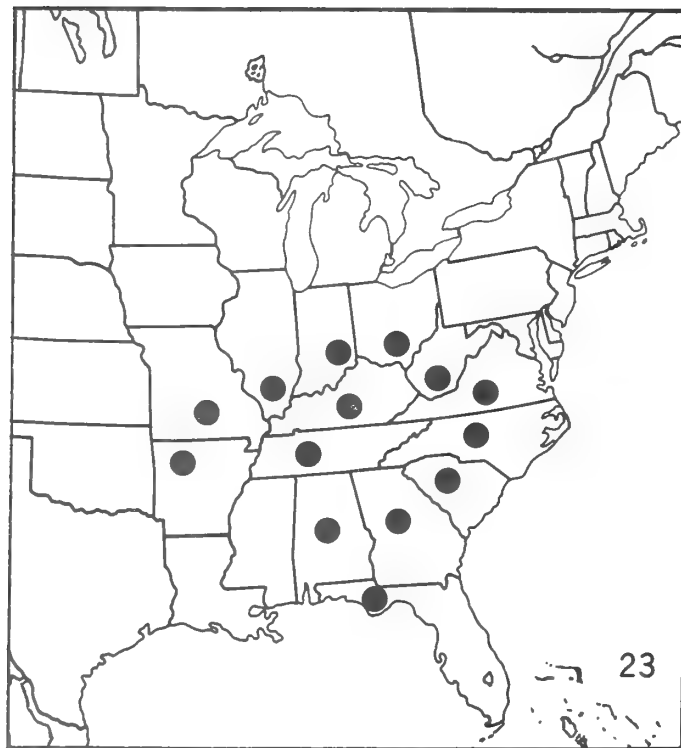
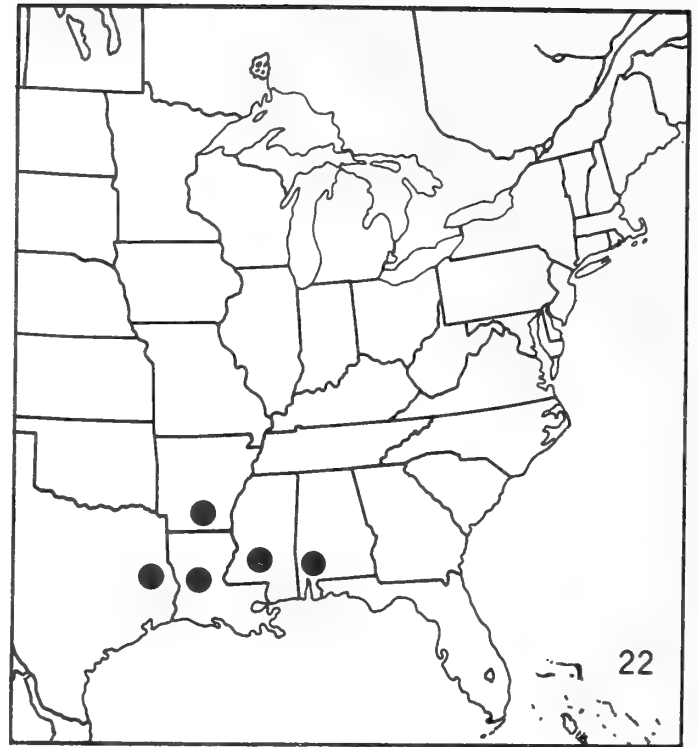
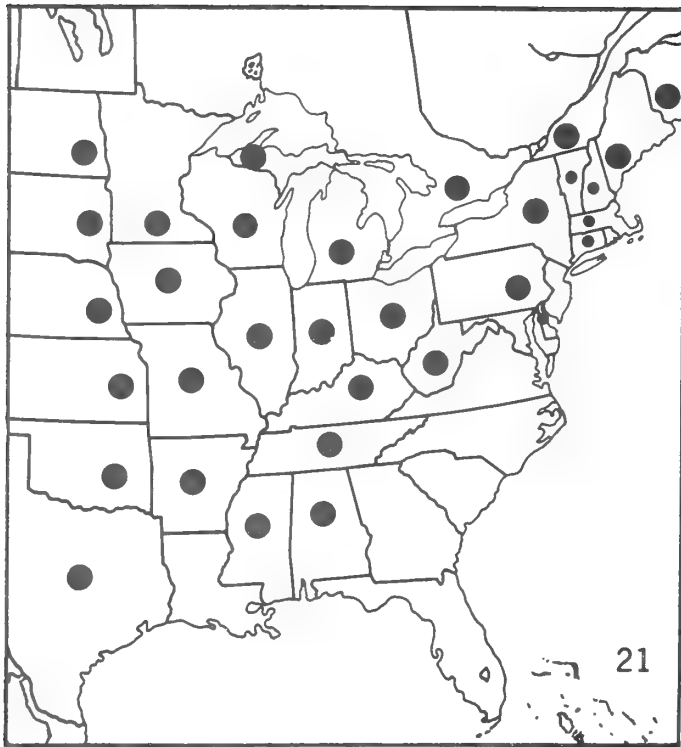
Map 6.—*Crataegus calpodendron* (Ehrh.) Medic., pear hawthorn. Map 7.—*Crataegus coccinea* L., scarlet hawthorn. Map 8.—*Crataegus columbiana*, Columbia hawthorn. Map 9.—*Crataegus coccinioides* Ashe, Kansas hawthorn.



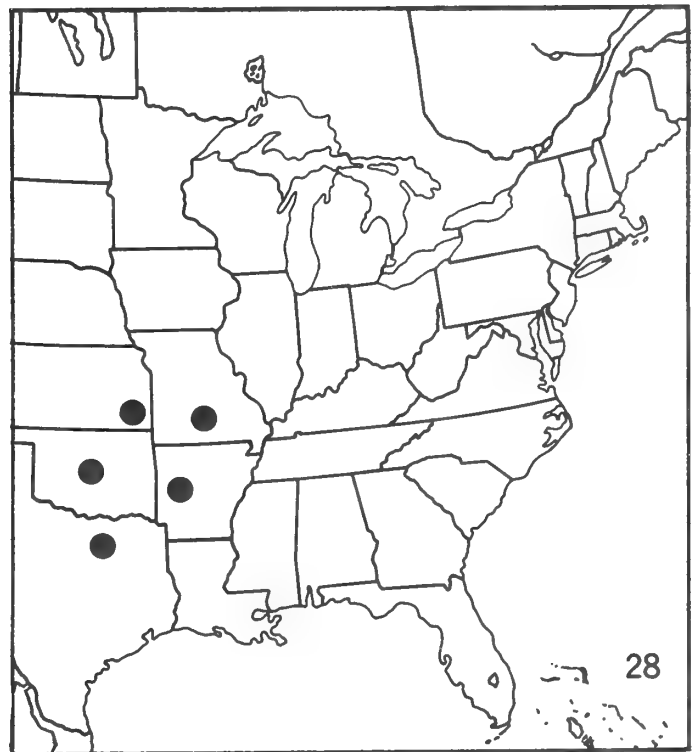
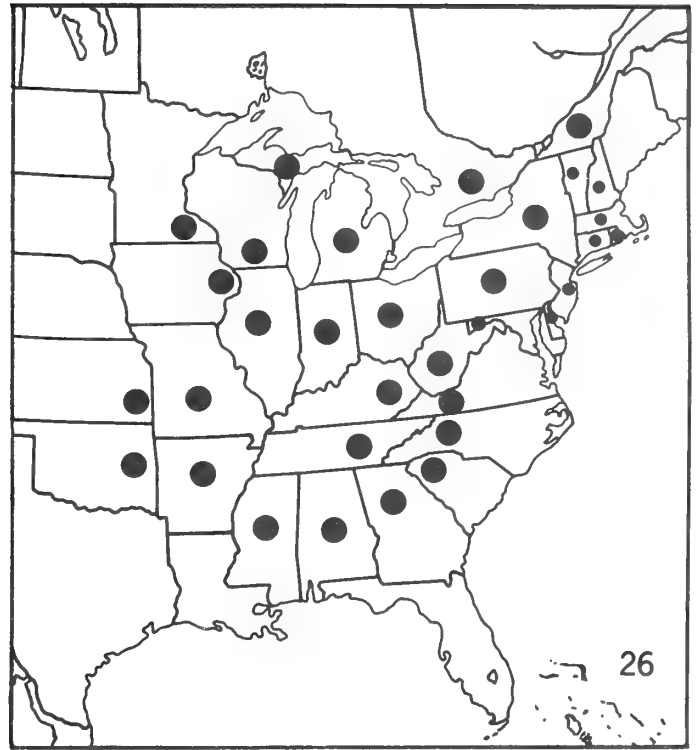
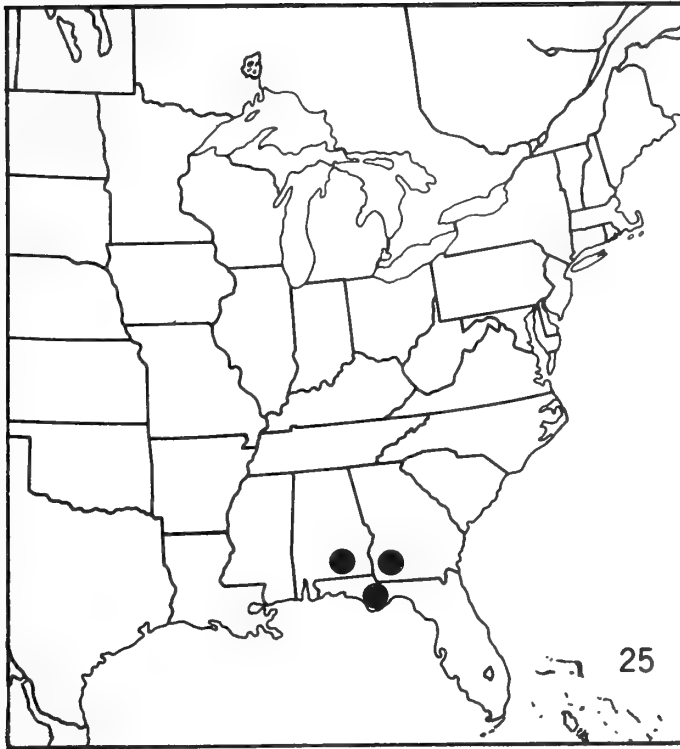
Map 13.—*Crataegus erythropoda* Ashe, Cerro hawthorn. Map 14.—*Crataegus flabellata* (Bosc) K. Koch, fanleaf hawthorn. Also N.S. and Nfld. Map 15.—*Crataegus greggiana* Eggl., Gregg hawthorn. Map 16.—*Crataegus flava* Ait., yellow hawthorn.



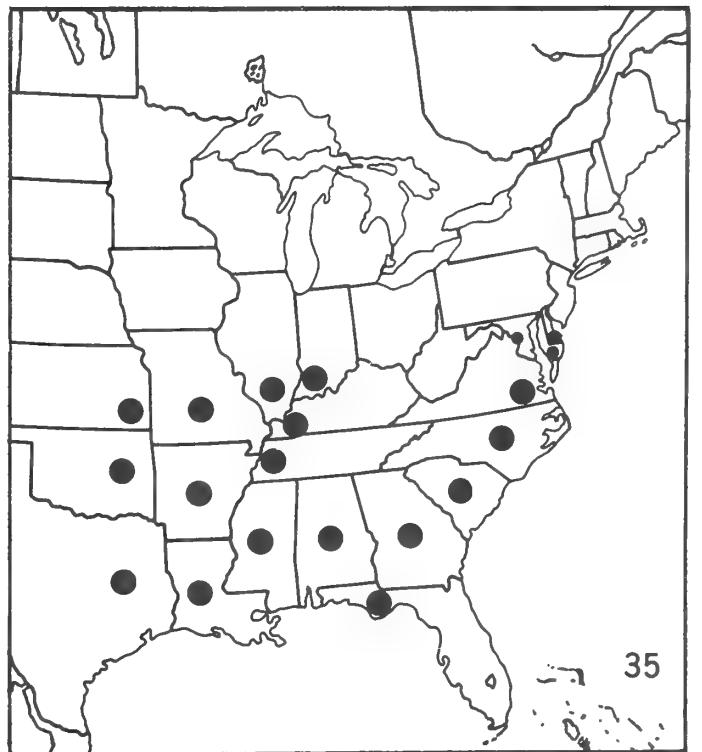
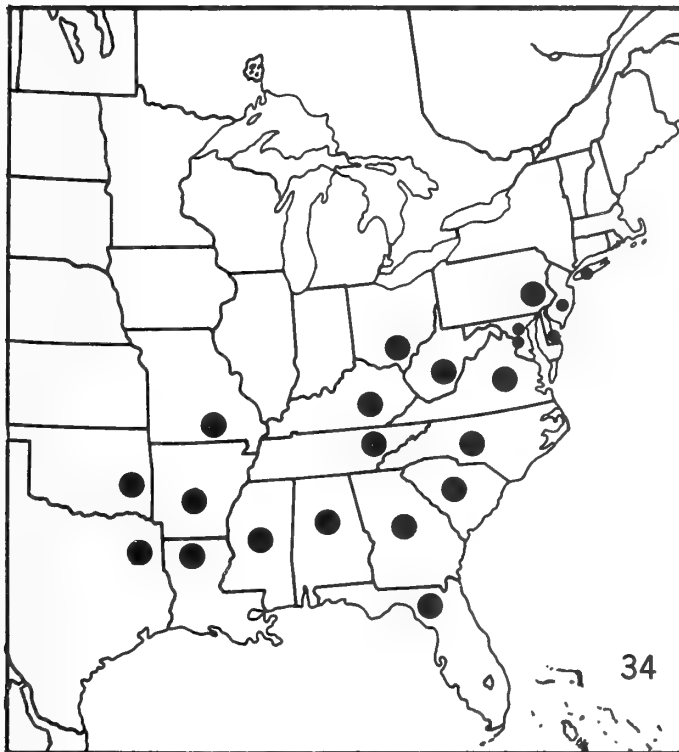
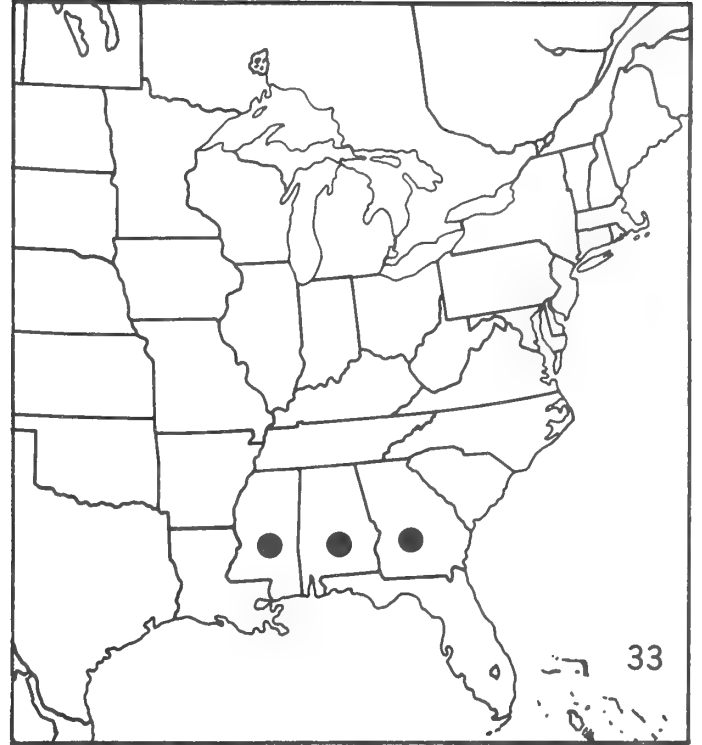
Map 17.—*Crataegus harbisonii* Beadle, Harbison hawthorn. Map 18.—*Crataegus intricata* Lange, Biltmore hawthorn. Map 19.—*Crataegus lacrimata* Small, Pensacola hawthorn. Map 20.—*Crataegus marshallii* Eggl., parsley hawthorn.



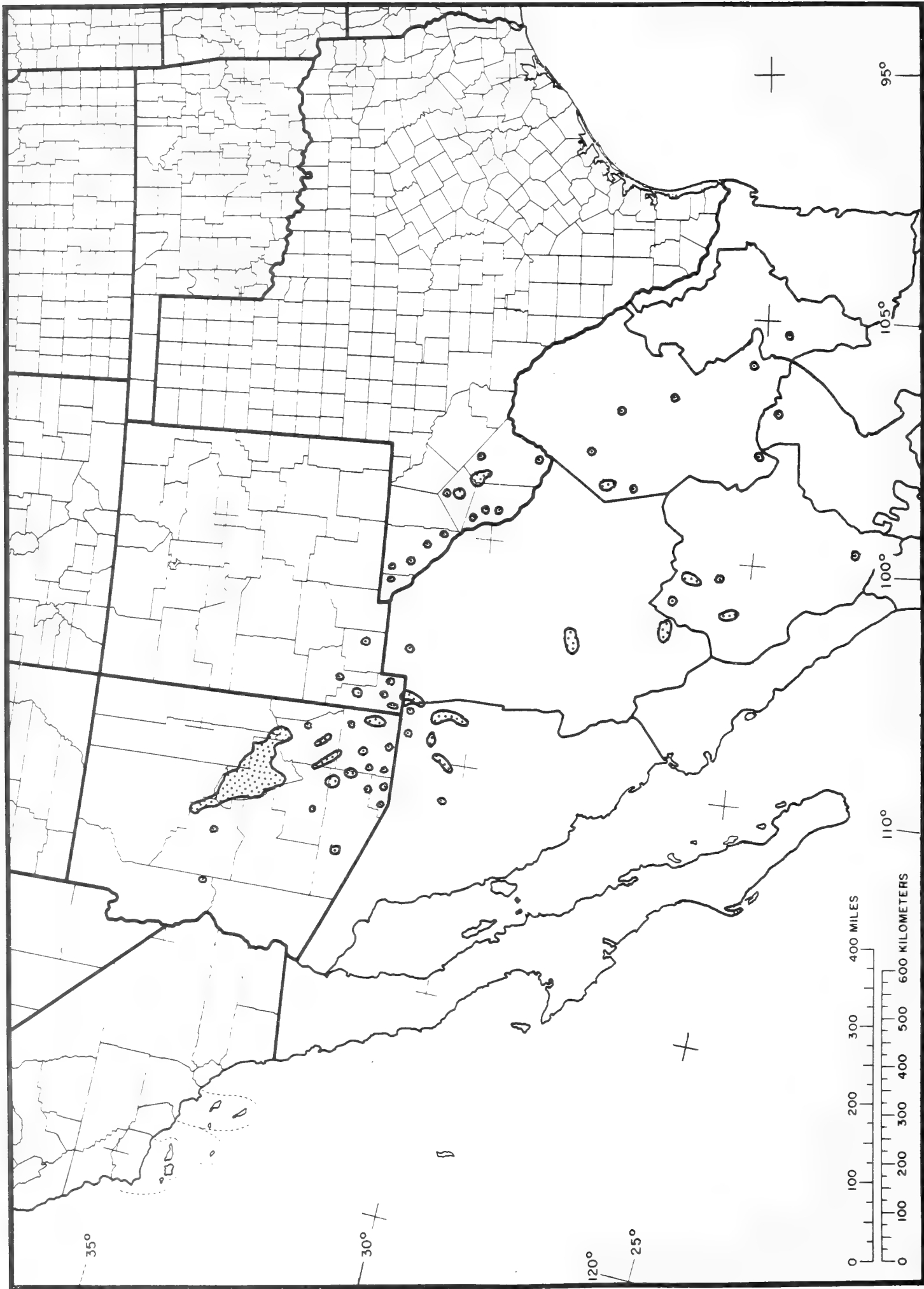
Map 21.—*Crataegus mollis* Scheele, downy hawthorn. Also N.S. Map 22.—*Crataegus opaca* Hook. & Arn., riverflat hawthorn.
 Map 23.—*Crataegus phaenopyrum* (L. f.) Medic., Washington hawthorn. Map 24.—*Crataegus pruinosa* (H. L. Wendl.) K. Koch, frosted hawthorn.



Map 25.—*Crataegus pulcherrima* Ashe, beautiful hawthorn. Map 26.—*Crataegus punctata* Jacq., dotted hawthorn. Map 27.—*Crataegus saligna* Greene, willow hawthorn. Map 28.—*Crataegus reverchonii* Sarg., Reverchon hawthorn.



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Map 36.—*Juniperus erythrocarpa* Cory, redberry juniper.

INDEX OF COMMON NAMES, VOLUMES 1-6

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