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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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USDA Forest Service, Washington, D.C.**

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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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CONTENTS

	<i>Page</i>
Lists of maps-----	iv
General and base maps, Volumes 1-6 -----	iv
Species maps, Volume 6-----	v
Introduction -----	1
General and base maps, Volumes 1-6 -----	2
Additions -----	2
Tree names -----	2
<i>Crataegus</i> , Hawthorn -----	2
Text ranges-----	3
Future work -----	3
Statistical summary of the Atlas -----	4
Selected references-----	5
Index of common names, Volumes 1-6 -----	19
Index of scientific names, Volumes 1-6 -----	25

LISTS OF MAPS

General and Base Maps, Volumes 1-6

Volume 1. Conifers and Important Hardwoods

Base Maps

Map No.	
1-W, 1-E	United States. Base map with names of counties, Provinces of Canada, and States of the northern part of Mexico.
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.
Endpapers	United States (contiguous), National Forest System, with names of National Forests and National Grasslands.

Overlays (In Pocket)

1-W, 1-E	Rivers and Natural Lakes.
2-W, 2-E	Physical Subdivisions, or Land-Surface Form.
3-W, 3-E	Topographic Relief. Contour lines at selected elevations.
4-W, 4-E	Plant Hardiness Zones. Approximate range of average annual minimum temperatures for each zone (in degrees Fahrenheit).
5-W, 5-E	Length of Growing Season. Mean length of freeze-free period (days) between last 32° F. temperature in spring and first 32° F. temperature in autumn.
6-W, 6-E	Precipitation or Rainfall. Normal annual total precipitation (inches).
7-W, 7-E	Climates of the United States. Normal distribution of the principal climates in the United States. Precipitation effectiveness (P-E) index.
8-W, 8-E	Maximum Extent of Glaciation in the Wisconsin Glacial Stage (Pleistocene Epoch).
9-W, 9-E	Major Forest Types.

Volume 2. Alaska Trees and Common Shrubs

General Maps

Map No.	
1	North America
2	Alaska with place names
3	National Forests, Parks, and Wildlife Refuges

4	Topography (contour map)
5	Relief map
6	Physiography (physiographic provinces of Alaska)
7	Geology (generalized)
8	Extent of glaciation in Alaska
9	Permafrost
10	Soils with agricultural potential
11	Climatic zones
12	Hydrology
13	Precipitation
14	Mean annual snowfall
15	Mean annual temperature (°F.)
16	Mean July maximum temperature (°F.)
17	Mean January minimum temperature (°F.)
18	Thawing index
19	Freezing index
20	Plant hardiness zones
21	Fire season climatic zones
22	Vegetation of Alaska
23	Forests of Alaska

Volume 3. Minor Western Hardwoods

Base Maps

Map No.	
1-NW, 1-SW	Western United States (contiguous). Base map with names of counties, Provinces of Canada, and States of the northern part of Mexico.
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.

Volume 4. Minor Eastern Hardwoods

Base Maps

Map No.	
1-NE	Northeastern United States (contiguous). Base map with names of counties.
1-SE	Southeastern United States (contiguous). Base map with names of counties.

- 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.

Volume 5. Florida

General Maps

Map No.

- 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.
- 2 West Indies. Southern Florida with reference to the principal islands.
- 3 Southeastern United States (contiguous). Base map with names of counties.
- 4 Florida, with names of counties, county seats, and physical features.
- 5 Florida, showing National Forests, Everglades National Park, and Biscayne National Monument.
- 6 Florida, Plant Hardiness Zones.

- 15 *Crataegus greggiana* Eggl., Gregg hawthorn
- 16 *Crataegus flava* Ait., yellow hawthorn
- 17 *Crataegus harbisonii* Beadle, Harbison hawthorn
- 18 *Crataegus intricata* Lange, Biltmore hawthorn
- 19 *Crataegus lacrimata* Small, Pensacola hawthorn
- 20 *Crataegus marshallii* Eggl., parsley hawthorn
- 21 *Crataegus mollis* Scheele, downy hawthorn
- 22 *Crataegus opaca* Hook. & Arn., riverflat hawthorn
- 23 *Crataegus phaenopyrum* (L. f.) Medic., Washington hawthorn
- 24 *Crataegus pruinosa* (H. L. Wendl.) K. Koch, frosted hawthorn
- 25 *Crataegus pulcherrima* Ashe, beautiful hawthorn
- 26 *Crataegus punctata* Jacq., dotted hawthorn
- 27 *Crataegus saligna* Greene, willow hawthorn
- 28 *Crataegus reverchonii* Sarg., Reverchon hawthorn
- 29 *Crataegus spathulata* Michx., littlehip hawthorn
- 30 *Crataegus texana* Buckl., Texas hawthorn
- 31 *Crataegus succulenta* Schrad., fleshy hawthorn
- 32 *Crataegus tracyi* Ashe ex Eggl., Tracy hawthorn
- 33 *Crataegus triflora* Chapm., threeflower hawthorn
- 34 *Crataegus uniflora* Muenchh., oneflower hawthorn
- 35 *Crataegus viridis* L., green hawthorn
- 36 *Juniperus erythrocarpa* Cory, redberry juniper

Volume 6. Supplement

Base Maps

Map No.

- 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.
- 2 United States (contiguous). National Forest System, with names of National Forests and National Grasslands.
- 3 United States (contiguous). Base map with names of States.

Species Maps, Volume 6

Map No.

- 1 *Crataegus aestivalis* (Walt.) Torr. & Gray, May hawthorn
- 2 *Crataegus berberifolia* Torr. & Gray, barberry hawthorn
- 3 *Crataegus brachyacantha* Sarg. & Engelm., blueberry hawthorn
- 4 *Crataegus brainerdii* Sarg., Brainerd hawthorn
- 5 *Crataegus chrysocarpa* Ashe, fireberry hawthorn
- 6 *Crataegus calpodendron* (Ehrh.) Medic., pear hawthorn
- 7 *Crataegus coccinea* L., scarlet hawthorn
- 8 *Crataegus columbiana*, Columbia hawthorn
- 9 *Crataegus coccinioides* Ashe, Kansas hawthorn
- 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.

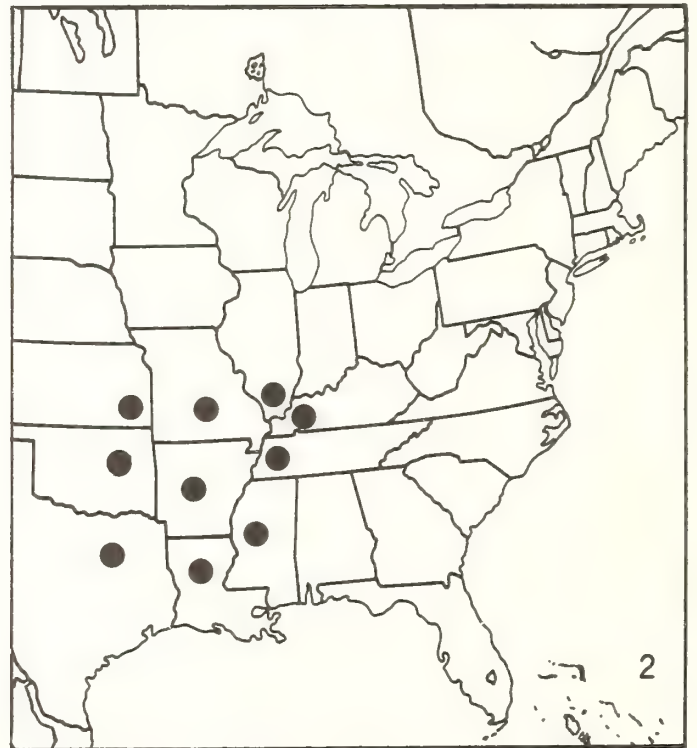
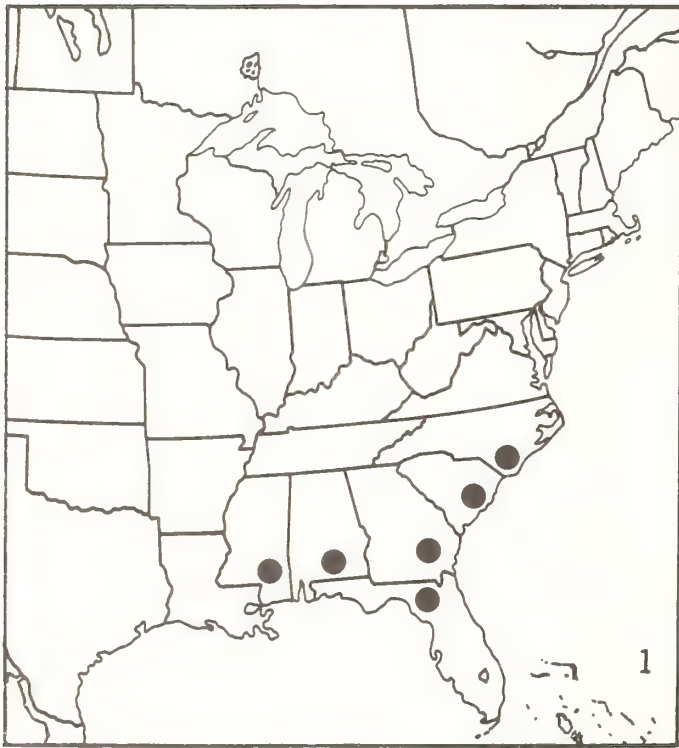
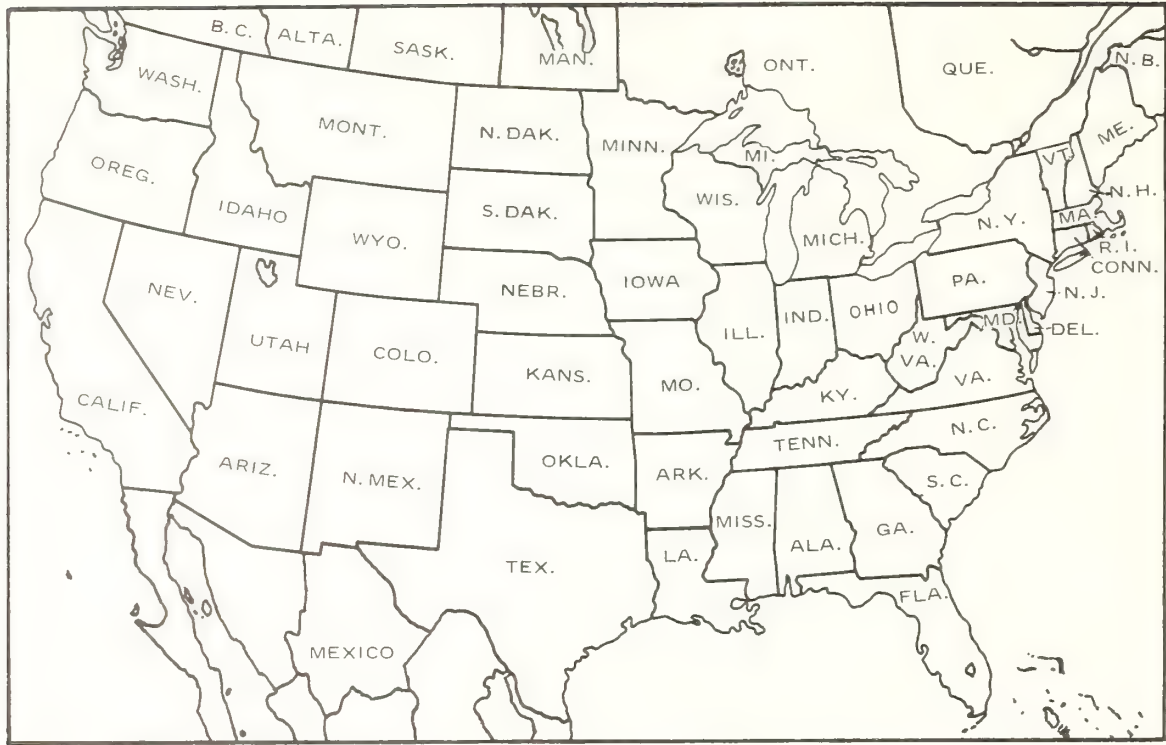
So, the number of tree species native in continental United States, as defined and mapped here, is about 684. This number includes some shrub species rarely attaining tree size and often omitted from tree lists. Also counted are 98 species of tropical hardwoods, all but 6 of which are confined to southern 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.

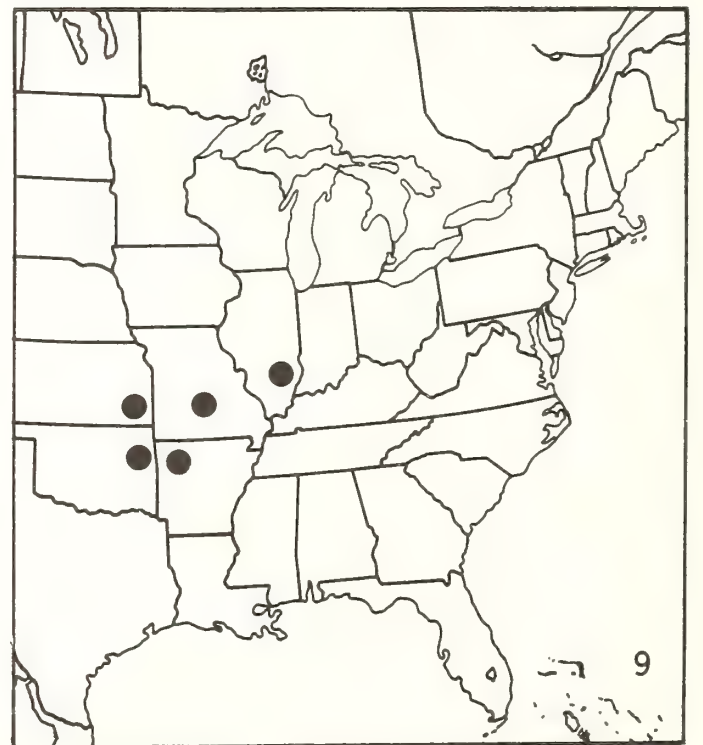
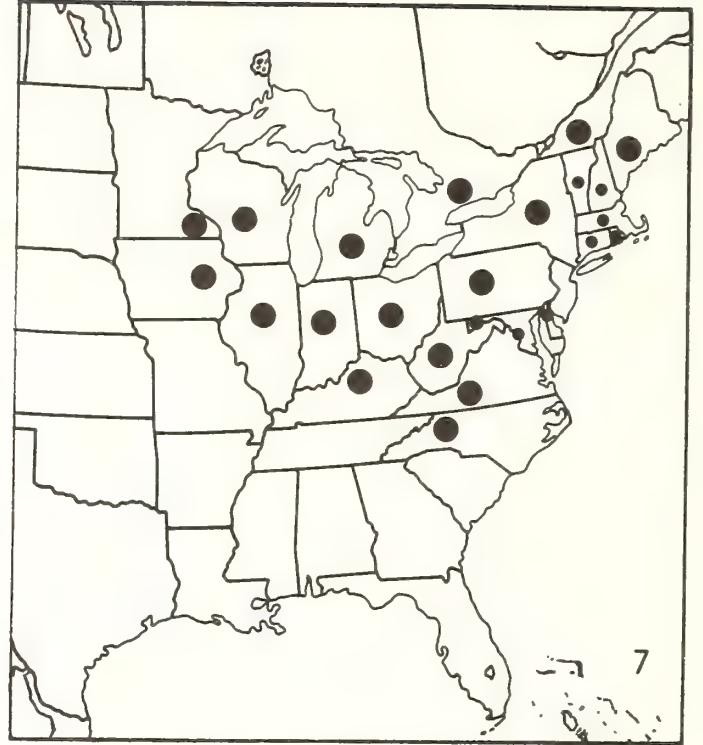
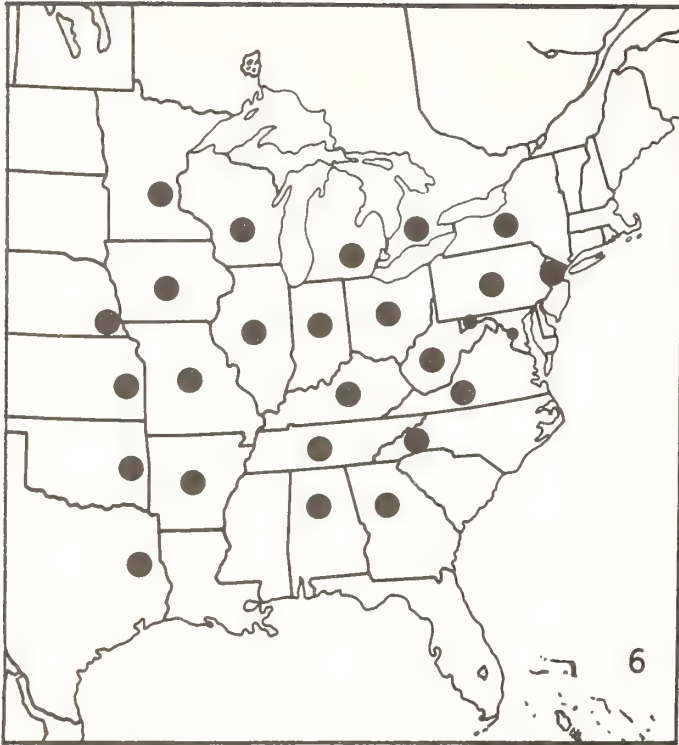
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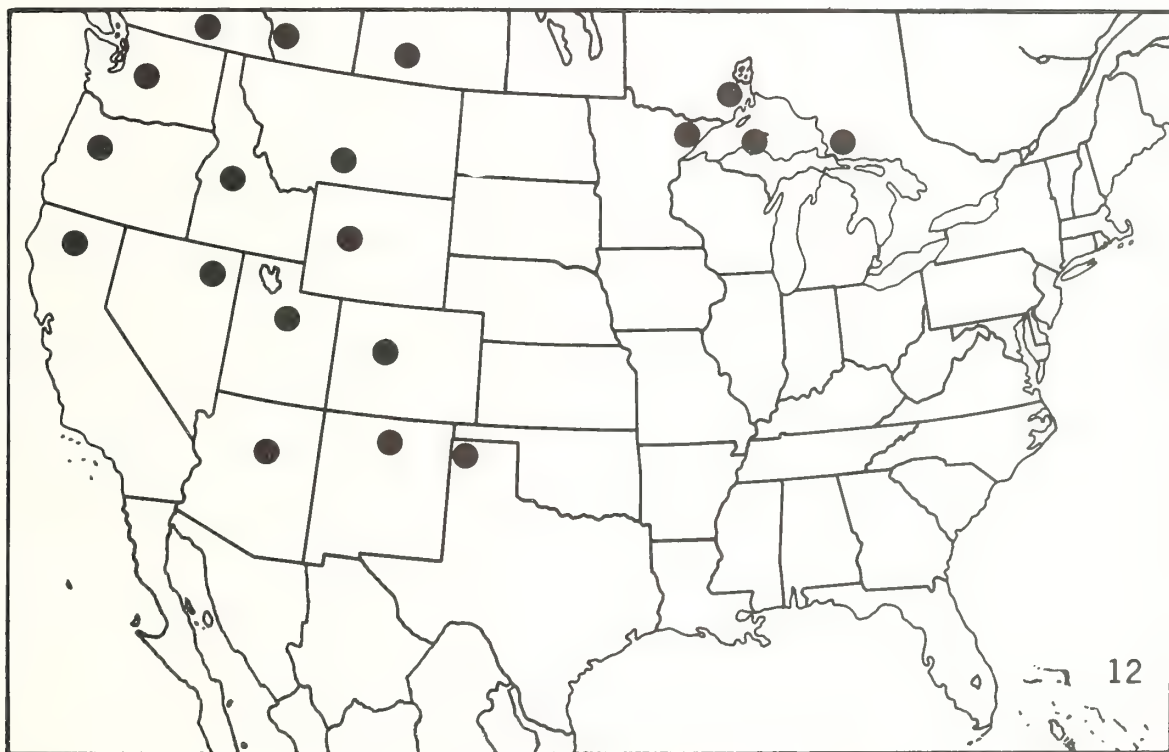
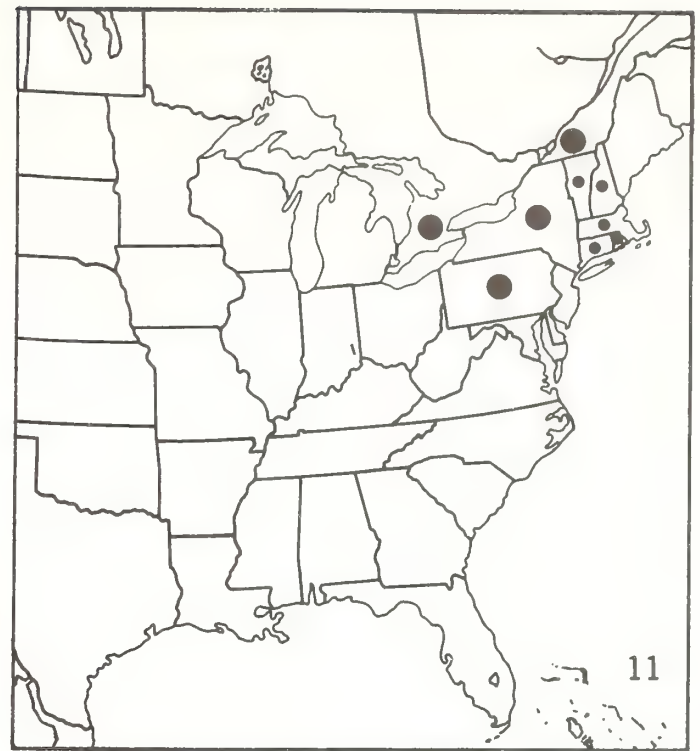
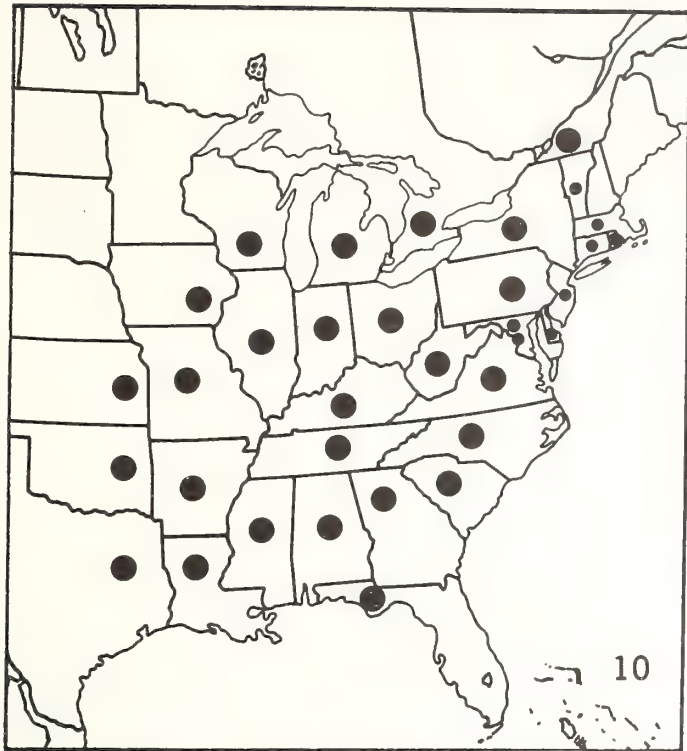


Base Map 3.—United States (contiguous). Base map with names of States.

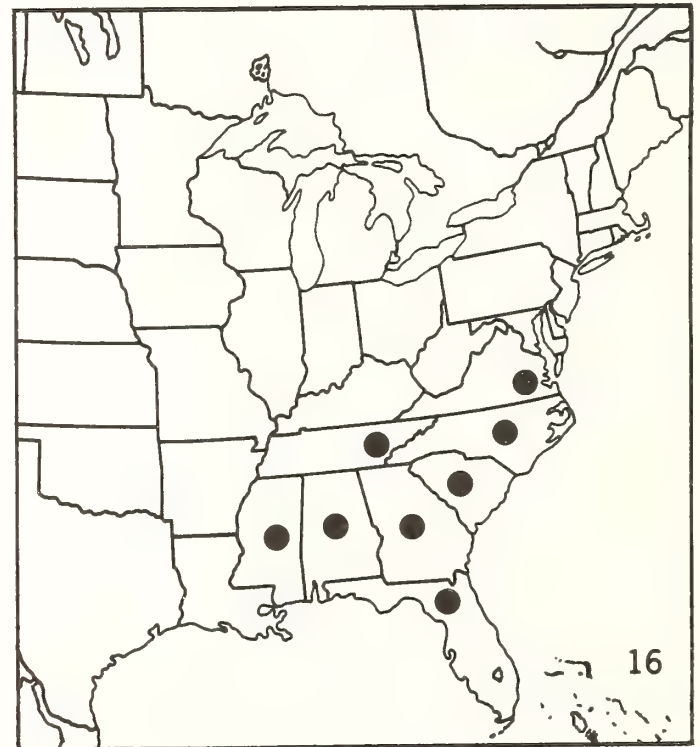
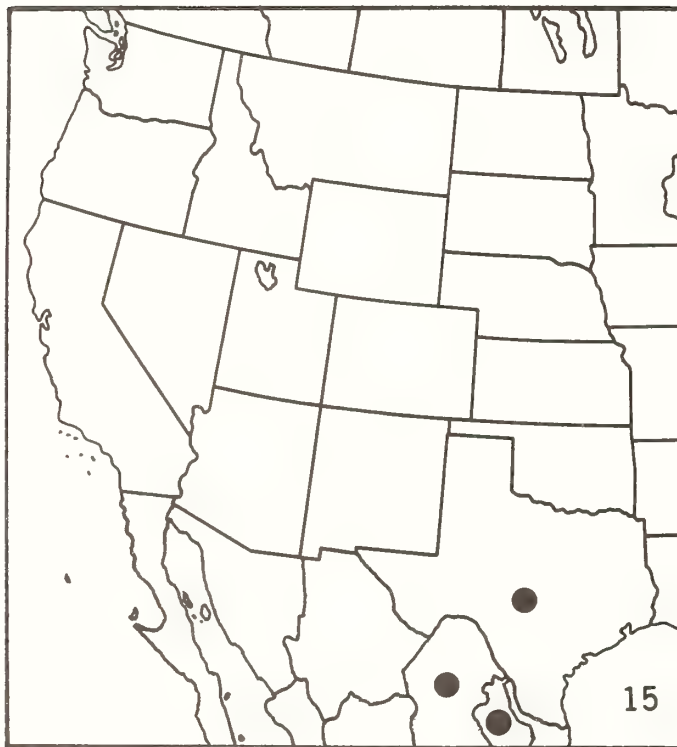
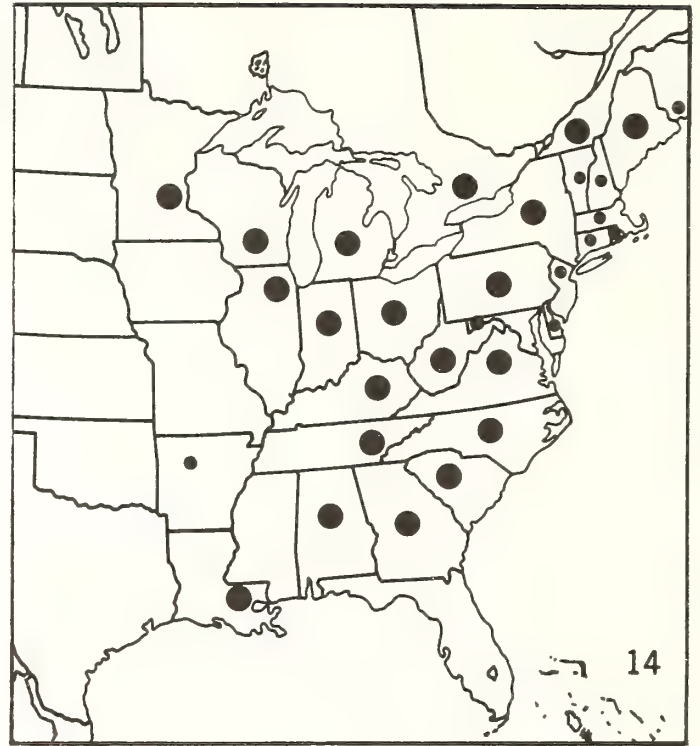
Map 1.—*Crataegus aestivalis* (Walt.) Torr. & Gray, May hawthorn. Map 2.—*Crataegus berberifolia* Torr. & Gray, barberry hawthorn.



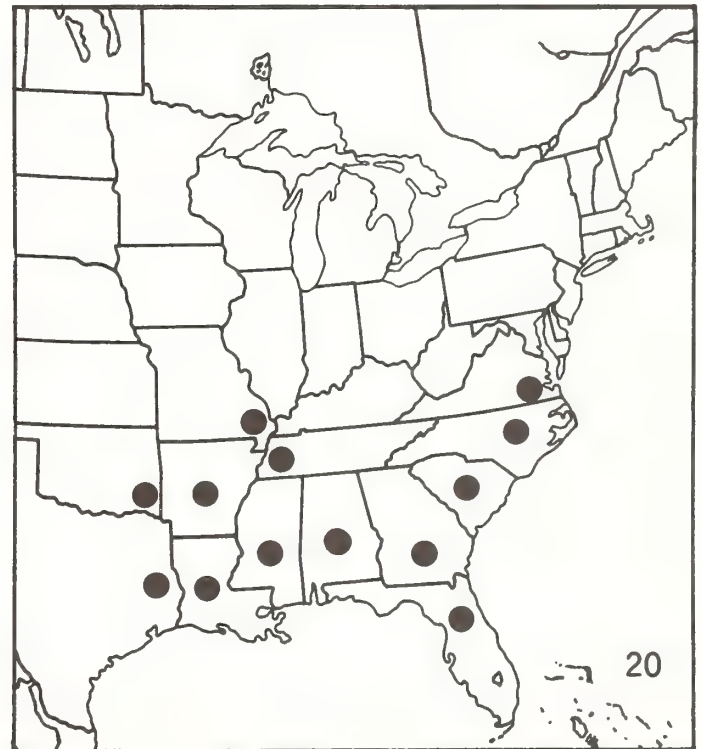
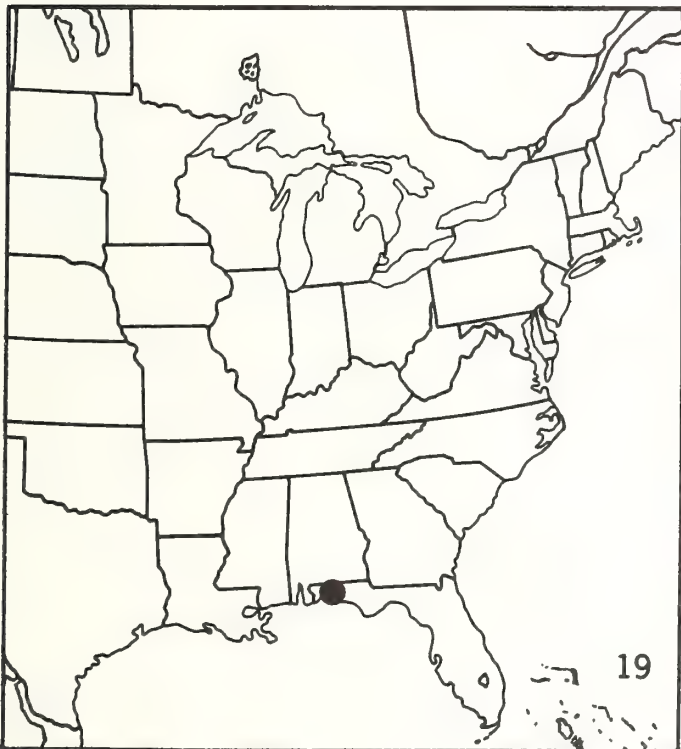
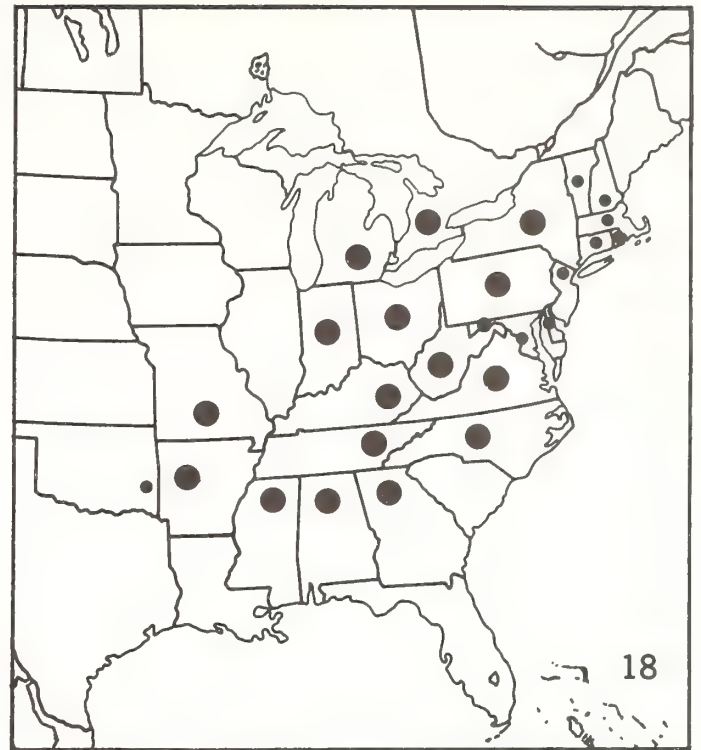
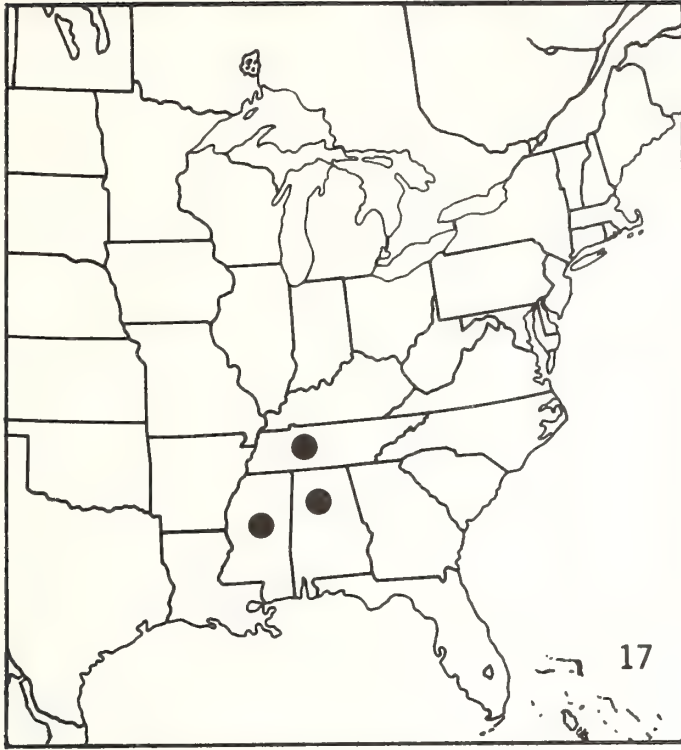
Map 6.—*Crataegus calpodendron* (Ehrh.) Medic., pear hawthorn. Map 7.—*Crataegus coccinea* L., scarlet hawthorn. Map 8.—*Crataegus columbiana*, Columbia hawthorn. Map 9.—*Crataegus coccinioides* Ashe, Kansas hawthorn.



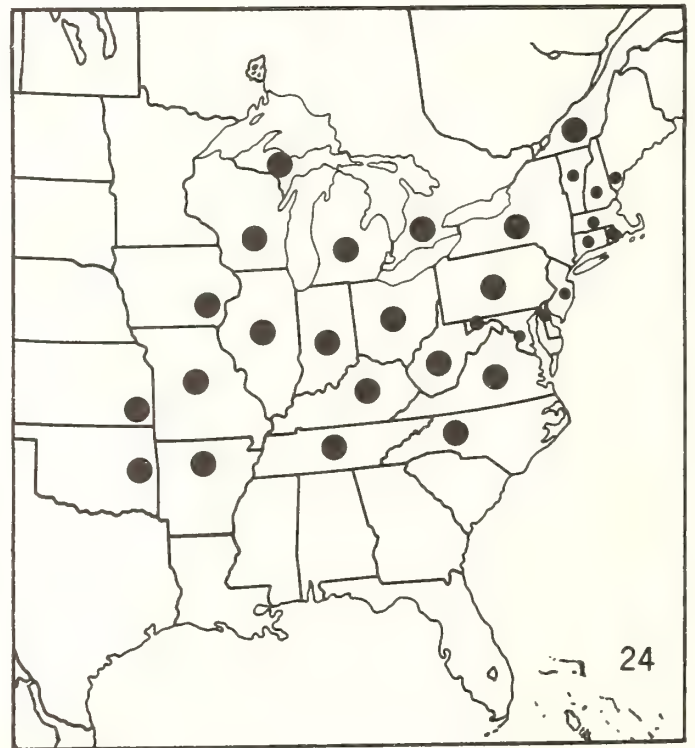
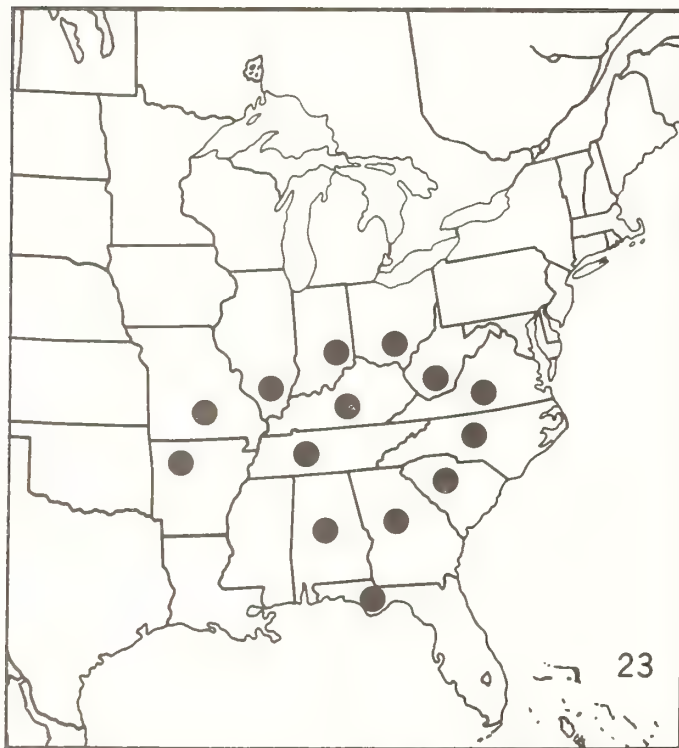
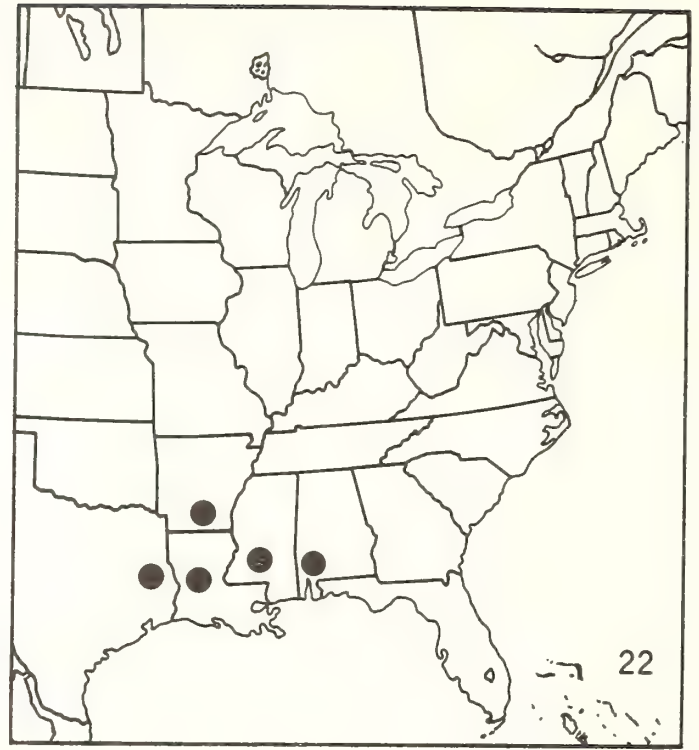
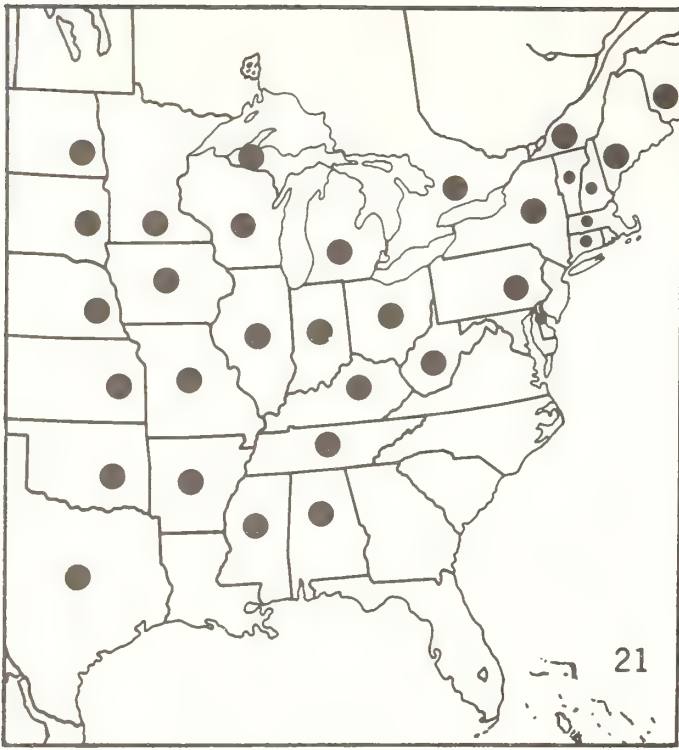
Map 10.—*Crataegus crus-galli* L., cockspur hawthorn. Map 11.—*Crataegus dilatata* Sarg., broadleaf hawthorn. Map 12.—*Crataegus douglasii* Lindl., black hawthorn.



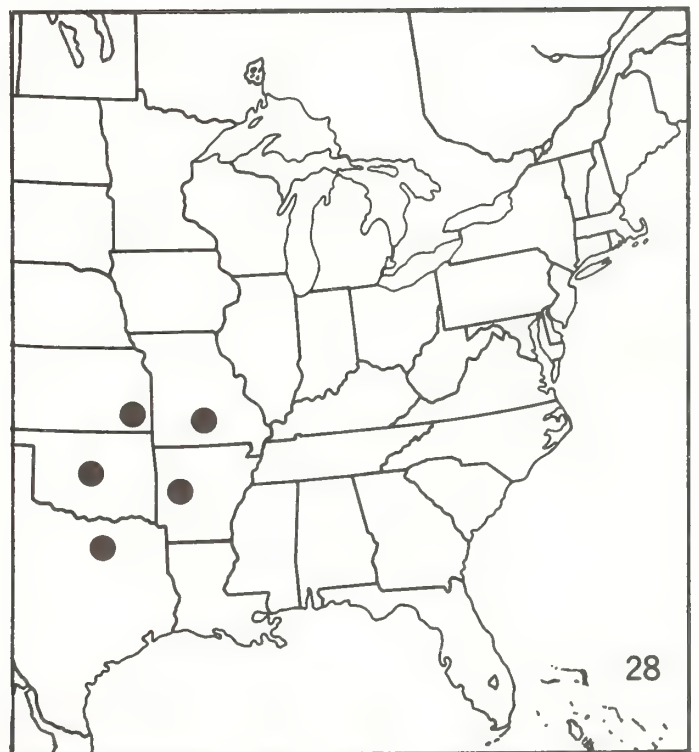
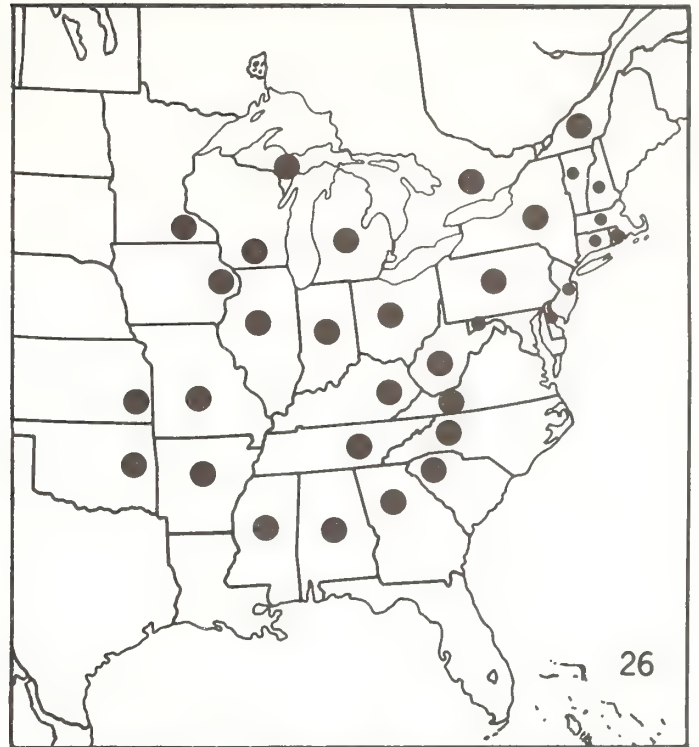
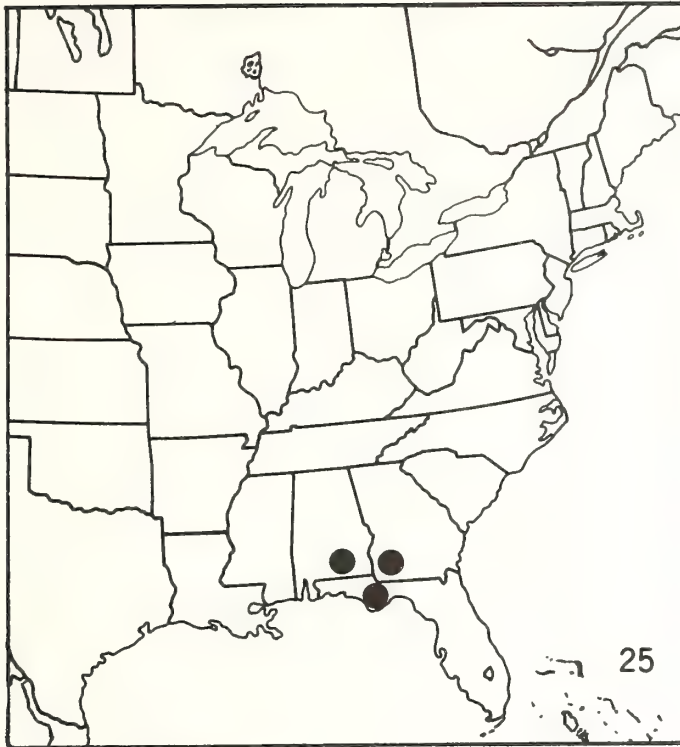
Map 13.—*Crataegus erythropoda* Ashe, Cerro hawthorn. Map 14.—*Crataegus flabellata* (Bosc) K. Koch, fanleaf hawthorn. Also N.S. and Nfld. Map 15.—*Crataegus greggiana* Eggl., Gregg hawthorn. Map 16.—*Crataegus flava* Ait., yellow hawthorn.



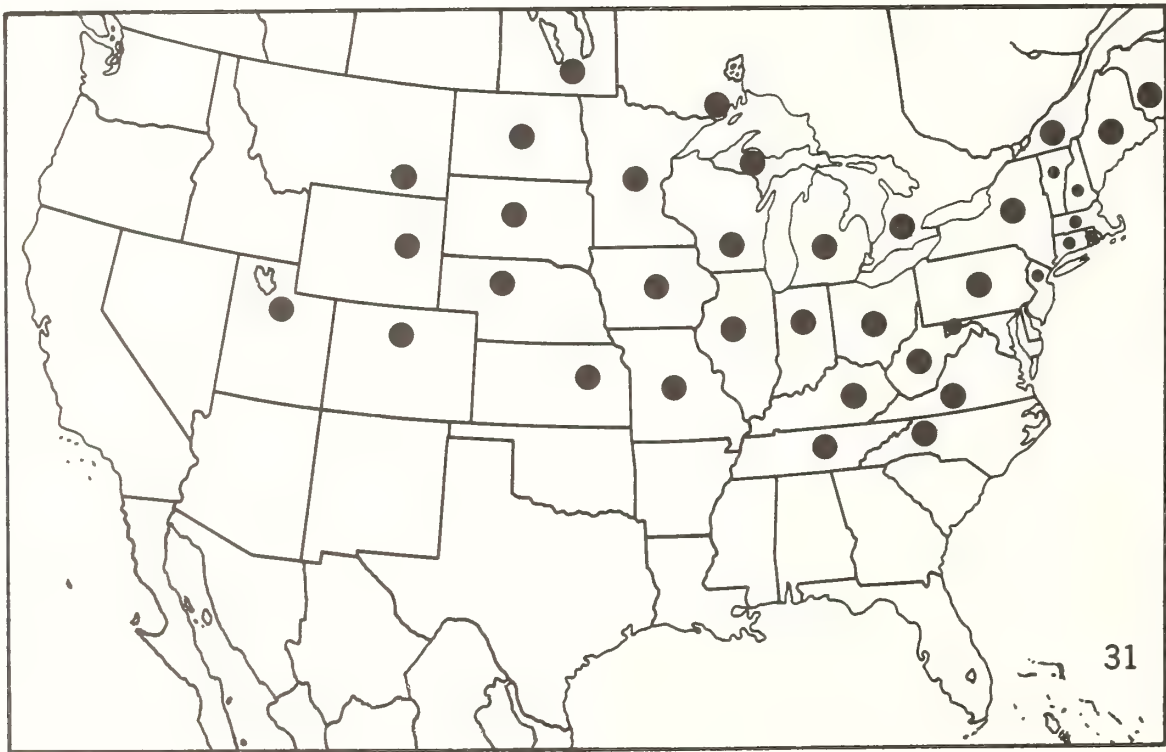
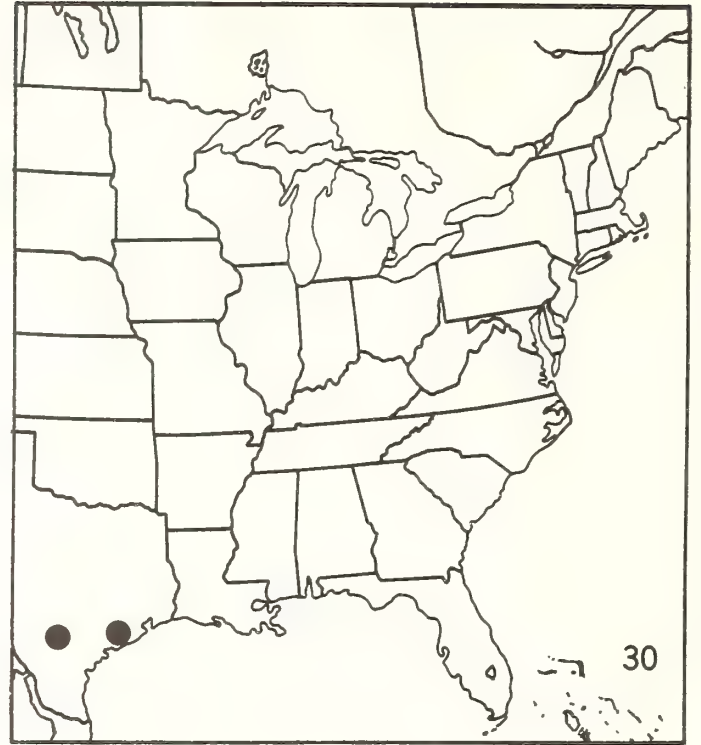
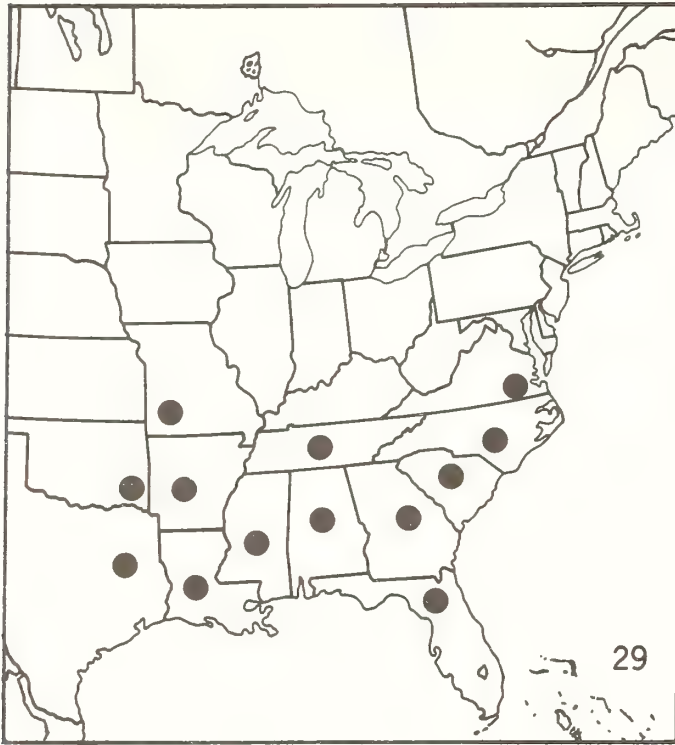
Map 17.—*Crataegus harbisonii* Beadle, Harbison hawthorn. Map 18.—*Crataegus intricata* Lange, Biltmore hawthorn. Map 19.—*Crataegus lacrimata* Small, Pensacola hawthorn. Map 20.—*Crataegus marshallii* Eggl., parsley hawthorn.



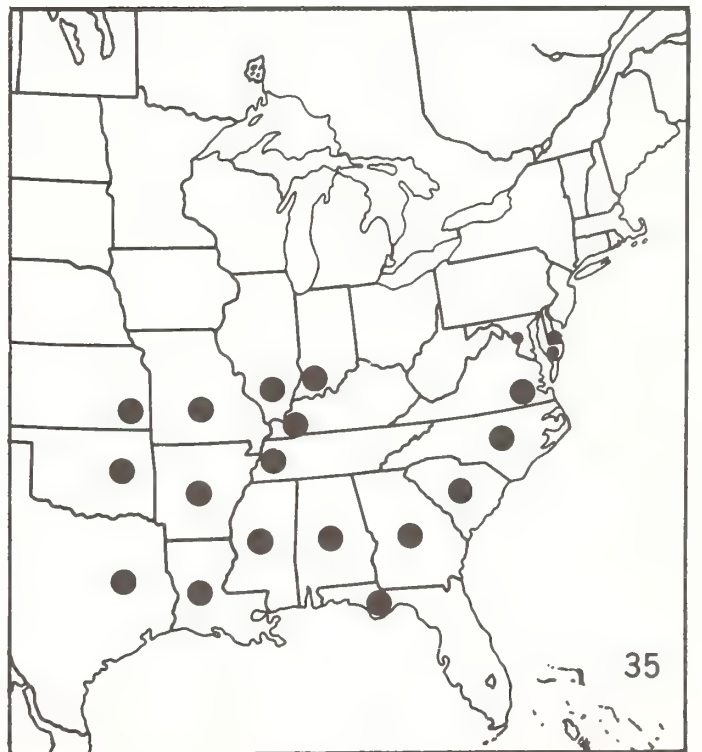
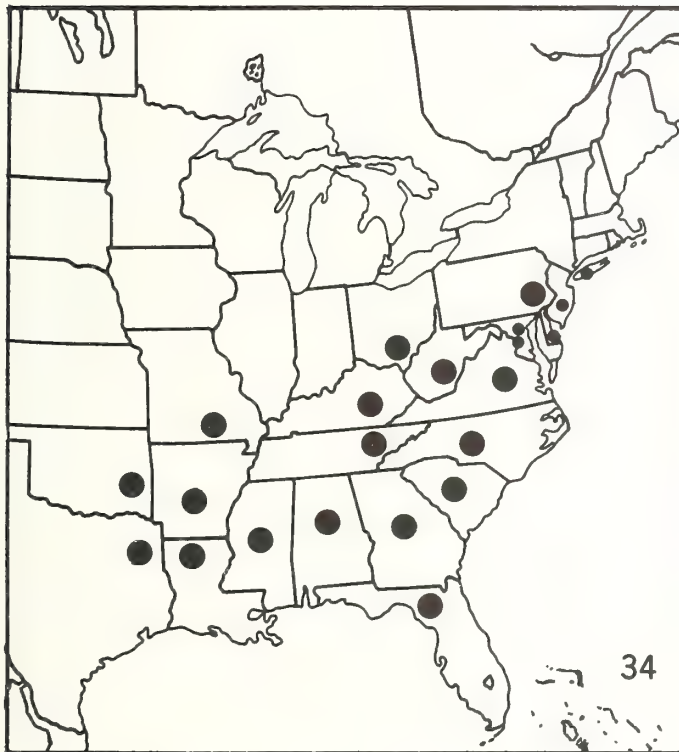
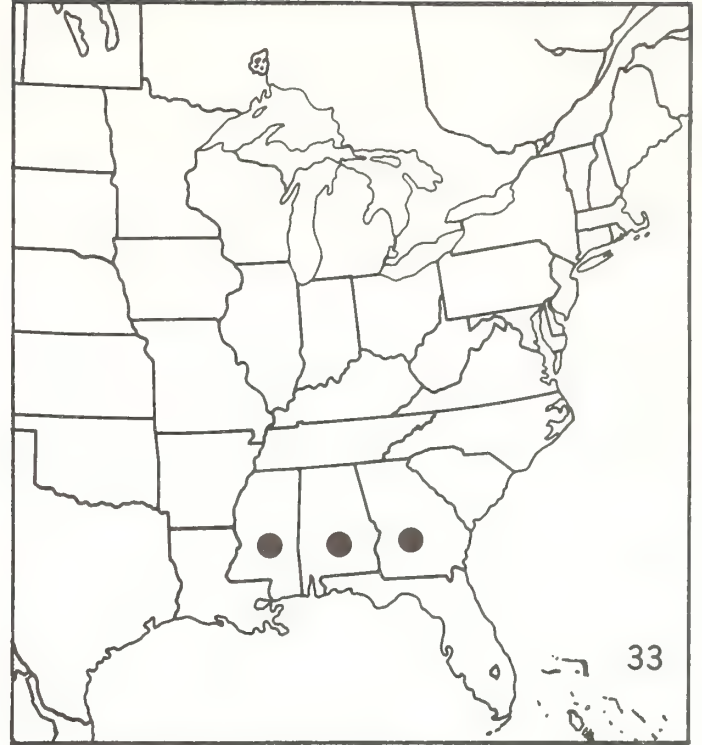
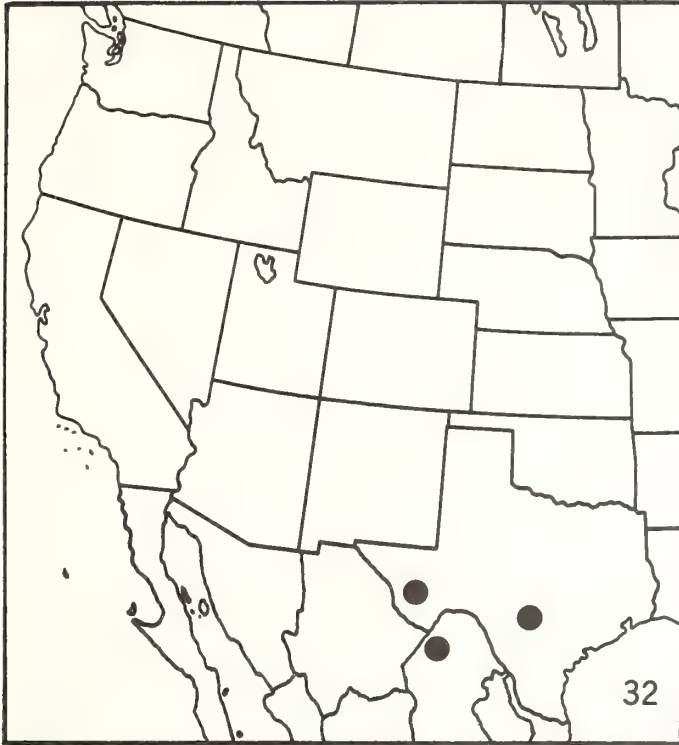
Map 21.—*Crataegus mollis* Scheele, downy hawthorn. Also N.S. Map 22.—*Crataegus opaca* Hook. & Arn., riverflat hawthorn.
 Map 23.—*Crataegus phaenopyrum* (L. f.) Medic., Washington hawthorn. Map 24.—*Crataegus pruinosa* (H. L. Wendl.) K. Koch, frosted hawthorn.



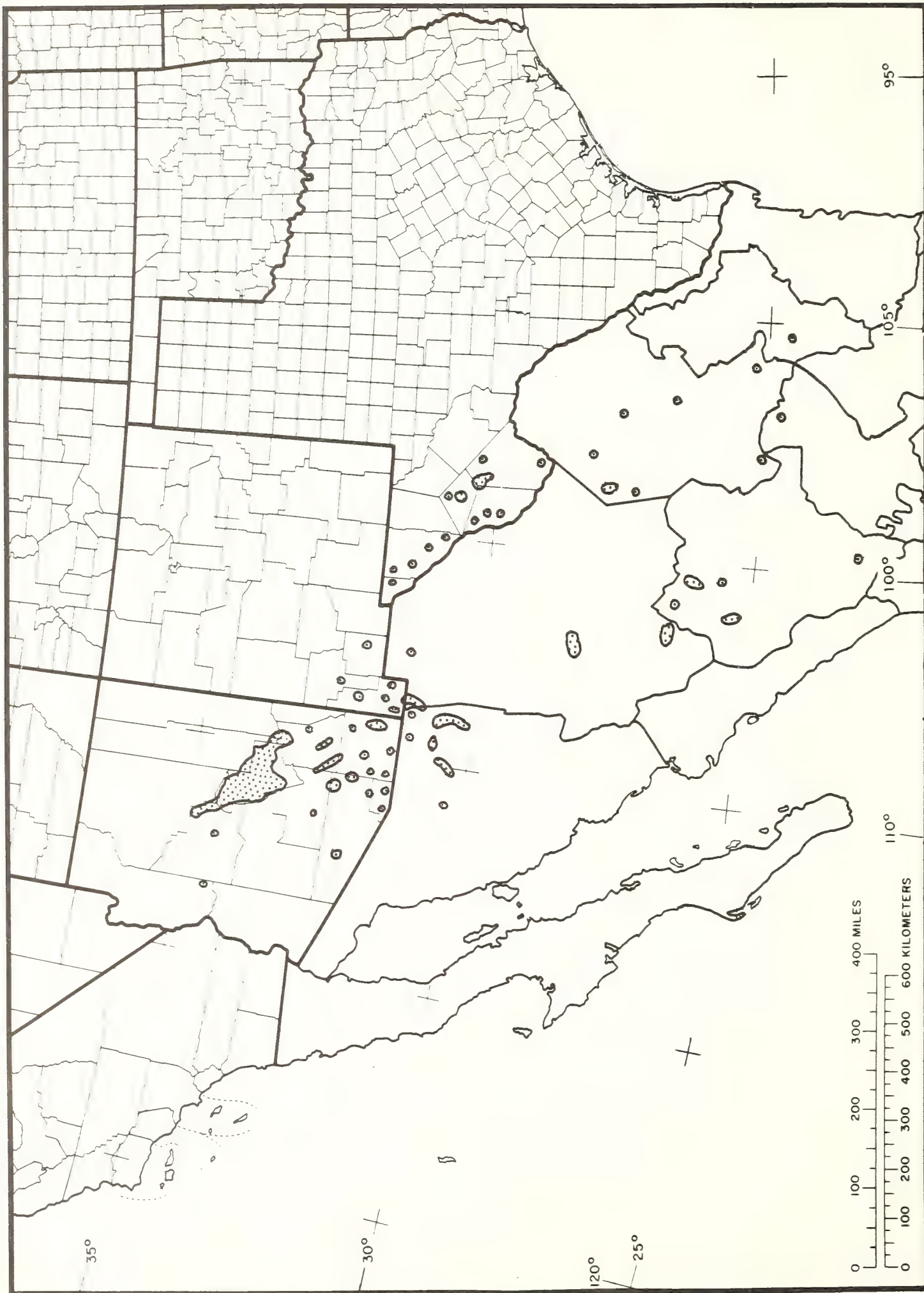
Map 25.—*Crataegus pulcherrima* Ashe, beautiful hawthorn. Map 26.—*Crataegus punctata* Jacq., dotted hawthorn. Map 27.—*Crataegus saligna* Greene, willow hawthorn. Map 28.—*Crataegus reverchonii* Sarg., Reverchon hawthorn.



Map 29.—*Crataegus spathulata* Michx., littlehip hawthorn. Map 30.—*Crataegus texana* Buckl., Texas hawthorn. Map 31.—*Crataegus succulenta* Schrad., fleshy hawthorn. Also N.S. and P.E.I.



Map 32.—*Crataegus tracyi* Ashe ex Eggl., Tracy hawthorn. Map 33.—*Crataegus triflora* Chapm., threeflower hawthorn. Map 34.—*Crataegus uniflora* Muenchh., oneflower hawthorn. Map 35.—*Crataegus viridis* L., green hawthorn.



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

INDEX OF COMMON NAMES, VOLUMES 1-6

This index contains the species maps in all 6 volumes. Numbers refer to maps, which are unpagged. Volume numbers are in heavy (boldface) type followed by a colon. Map numbers are in ordinary (roman) type.

- acacia, Berlandier, **3**: 1-N,
1-SW
- acacia, blackbrush, **3**: 4
- acacia, catclaw, **3**: 3
- acacia, long-spine, **5**: 160
- acacia, Roemer, **3**: 5
- acacia, sweet, **3**: 2
- acacia, twisted, **3**: 6-N, 6-SW
- acacia, Wright, **3**: 7
- Alaska-cedar, **1**: 12-W, 12-N;
2: 12
- alder, American green, **2**: 37
- alder, Arizona, **3**: 12
- alder, hazel, **4**: 10-NE,
10-SE, 10-N; **5**: 20
- alder, red, **1**: 104-W, 104-N;
2: 39
- alder, seaside, **4**: 8
- alder, Sitka, **2**: 38; **3**: 14-N,
14-W
- alder, speckled, **4**: 9-N, 9-NE
- alder, thinleaf, **2**: 40; **3**:
15-N, 15-W
- alder, white, **3**: 13
- allthorn, **3**: 95-N, 95-SW
- alvaradoa, Mexican, **5**: 162
- anacahuita, **3**: 48-N, 48-SW
- anaqua, **3**: 67-N, 67-SW
- anise-tree, Florida, **4**: 72-N,
72-NE; **5**: 74
- anise-tree, yellow, **4**: 73; **5**: 75
- apple, Oregon crab, **2**: 39;
3: 100-N, 100-W
- apple, prairie crab, **4**: 84
- apple, southern crab, **4**: 82;
5: 87
- apple, sweet crab, **4**: 83
- apricot, desert, **3**: 121
- ash, Berlandier, **3**: 76
- ash, black, **1**: 129-N, 129-E
- ash, blue, **1**: 128-E
- ash, Carolina, **4**: 53; **5**: 55
- ash, Chihuahua, **3**: 81
- ash, fragrant, **3**: 77
- ash, Goodding, **3**: 79
- ash, green, **1**: 130-W,
130-E, 130-N; **5**: 56
- ash, Gregg, **3**: 80-N, 80-SW
- ash, Oregon, **1**: 127-W
- ash, pumpkin, **4**: 54; **5**: 57
- ash, singleleaf, **3**: 75
- ash, Texas, **3**: 82
- ash, two-petal, **3**: 78
- ash, velvet, **3**: 83
- ash, white, **1**: 126-N, 126-E;
5: 54
- aspen, bigtooth, **1**: 152-N,
152-E
- aspen, quaking, **1**: 154-W,
154-E, 154-N; **2**: 17
- baccharis, eastern, **4**: 18-NE,
18-SE; **5**: 24
- baldecypress, **1**: 84-E; **5**: 11
- baldecypress, Montezuma, **1**:
83-W, 83-N
- barreta, **3**: 89-N, 89-SW
- basswood, American, **1**: 193-E
- basswood, Carolina, **4**: 153;
5: 145
- basswood, white, **1**: 194-E;
5: 146
- bayberry, evergreen, **4**: 86;
5: 90
- bayberry, northern, **4**: 88-N,
88-NE
- bayberry, odorless, **4**: 87; **5**:
91
- bayberry, Pacific, **3**: 101
- bayberry, southern, **4**: 85; **5**:
89
- baycedar, **5**: 246
- bearberry, **2**: 66
- beech, American, **1**: 125-N,
125-E; **5**: 51
- birch, Ashe, **4**: 19
- birch, dwarf arctic, **2**: 34
- birch, gray, **1**: 108-N, 108-E
- birch, paper, **1**: 107-N,
107-W, 107-E; **2**: 36
- birch, resin, **2**: 35
- birch, river, **1**: 110-E; **5**: 25
- birch, sweet, **1**: 106-E
- birch, yellow, **1**: 105-N,
105-E
- birch, water, **3**: 22-N, 22-NW
- bitterbush, **5**: 228
- blackbead, catclaw, **5**: 232
- blackbead, ebony, **3**: 110-N,
110-SW
- blackbead, Guadeloupe, **5**: 231
- black-calabash, **5**: 163
- blackhaw, **4**: 158
- blackhaw, rusty, **4**: 160; **5**: 155
- black-mangrove, **4**: 17-N,
17-SE; **5**: 168
- bladdernut, American, **4**:
143-NE, 143-SE; **5**: 140
- bladdernut, Sierra, **3**: 195
- blolly, **5**: 208
- blueberry, Alaska, **2**: 75
- blueberry, bog, **2**: 79
- blueberry, dwarf, **2**: 76
- blueberry, early, **2**: 77
- blueblossom, **3**: 31
- bluewood, **3**: 47
- bog-rosemary, **2**: 65
- boxelder, **1**: 96-W, 96-E,
96-N; **5**: 16
- buccaneer-palm, **5**: 234
- buckeye, bottlebrush, **4**: 5
- buckeye, California, **3**: 11
- buckeye, Ohio, **1**: 102-E
- buckeye, painted, **4**: 7
- buckeye, red, **4**: 6; **5**: 19
- buckeye, yellow, **1**: 103-E
- buckthorn, birchleaf, **3**: 149
- buckthorn, California, **3**: 151;
5: 129
- buckthorn, Carolina, **4**:
117-N, 117-SE
- buckthorn, cascara, **1**: 185-W,
185-N
- buckthorn, hollyleaf, **3**:
150-NW, 150-SW
- buckwheat-tree, **4**: 37; **5**: 45
- buffaloberry, **2**: 61
- buffaloberry, silver, **3**:
191-NW, 191-SW; **4**: 144
- bumelia, buckthorn, **4**: 21;
5: 27
- bumelia, gum, **3**: 24; **4**: 20;
5: 26
- bumelia, tough, **4**: 22; **5**: 28
- burningbush, eastern, **5**:
158.3
- bursera, fragrant, **3**: 26-N,
26-SW
- bushcranberry, high, **2**: 82
- bustic, willow, **5**: 194
- butternut, **1**: 133-E
- buttonbush, common, **3**:
34-NW, 34-SW, 34-N; **4**:
32-NE, 32-SE, 32-N; **5**: 42
- button-mangrove, **5**: 190
- byrsonima, key, **5**: 173
- California-laurel, **1**: 199-W
- canella, **5**: 176
- canotia, **3**: 28
- caper, Jamaica, **5**: 177
- caper, limber, **5**: 178
- catalpa, northern, **1**: 120-E
- catalpa, southern, **4**: 30; **5**: 39
- ceanothus, feltleaf, **3**: 29
- ceanothus, spiny, **3**: 30
- cercocarpus, birchleaf, **3**: 40
- cercocarpus, Catalina, **3**: 43
- cercocarpus, curlleaf, **3**: 42
- cercocarpus, hairy, **3**: 41
- cherry, bitter, **3**: 122-N,
122-W

cherry, black, **1**: 155-N,
 155-W, 155-E; **5**: 107
 cherry, Catalina, **3**: 124
 cherry, hollyleaf, **3**: 123
 cherry, pin, **3**: 125-N,
 125-NW; **4**: 103-N,
 104-NE
 cherry, West Indies, **5**: 233
 chestnut, American, **4**:
 27-NE, 27-SE; **5**: 37
 chinkapin, Allegheny, **4**: 29;
5: 38
 chinkapin, Florida, **4**: 26; **5**:
 36
 chinkapin, golden, **1**: 119-W
 chinkapin, Ozark, **4**: 28
 chokecherry, common, **3**:
 127-N, 127-NW, 127-SW;
4: 104-N, 104-NE
 cholla, jumping, **3**: 104
 Christmas-berry, **3**: 109-NW,
 109-SW
 cinnecord, **5**: 159
 cinquefoil, bush, **2**: 50
 clethra, cinnamon, **4**: 36
 cliffrose, **3**: 55-N, 55-SW
 clusia, Florida, **5**: 183
 cocoplum, **5**: 180
 coffeetree, Kentucky, **4**: 57
 colubrina, coffee, **5**: 187
 colubrina, Cuba, **5**: 188
 condalia, bitter, **3**: 46
 copperbush, **2**: 68
 coralbean, eastern, **4**: 48-N,
 48-SE
 coralbean, southeastern, **5**: 50
 coralbean, southwestern, **3**:
 68-N, 68-SW
 corkwood, **4**: 74; **5**: 78
 cottonwood, Arizona, **3**: 115
 cottonwood, black, **1**: 153-W,
 153-N; **2**: 16
 cottonwood, eastern, **1**:
 149-W, 149-E; **5**: 102
 cottonwood, Fremont, **1**:
 150-W
 cottonwood, Hinckley, **3**: 116
 cottonwood, narrowleaf, **3**: 114
 cottonwood, swamp, **1**: 151-E;
5: 103
 cranberrybush, American, **3**:
 200; **4**: 159-N, 159-NE
 crossopetalum, Florida, **5**: 192
 crowberry, **2**: 64
 cucumbertree, **1**: 140-E; **5**:
 82
 cupania, Florida, **5**: 193
 currant, American red, **2**: 47
 currant, northern black, **2**: 44
 currant, skunk, **2**: 43
 currant, stink, **2**: 42
 currant, trailing black, **2**: 46
 cypress, Arizona, **1**: 13-W
 cypress, Gowen, **1**: 15-W
 cypress, MacNab, **1**: 17-W
 cypress, Modoc, **1**: 14-W
 cypress, Monterey, **1**: 18-W
 cypress, Sargent, **1**: 19-W
 cypress, Tecate, **1**: 16-W
 cyrilla, swamp, **4**: 45-N,
 45-SE; **5**: 48
 dahoon, **4**: 64-N, 64-SE;
5: 66
 dahoon, myrtle, **4**: 69; **5**: 70
 darling-plum, **5**: 237
 desert-willow, **3**: 49
 devilsclub, **2**: 62
 devils-walkingstick, **4**: 15;
5: 22
 devilwood, **4**: 90; **5**: 95
 dogwood, alternate-leaf, **4**:
 38-NE, 38-SE, 38-N;
5: 46
 dogwood, blackfruit, **3**: 56
 dogwood, brown, **3**: 50
 dogwood, flowering, **1**: 124-N,
 124-E; **5**: 47
 dogwood, gray, **4**: 41
 dogwood, Pacific, **3**: 51-NW,
 51-SW
 dogwood, red-osier, **2**: 63; **3**:
 53-N, 53-NW, 53-SW; **4**:
 43-N, 43-NE
 dogwood, roughleaf, **4**: 39
 dogwood, roundleaf, **4**: 40-N,
 40-NE
 dogwood, stiffcornel, **4**: 42
 dogwood, swamp, **5**: 158.6
 dogwood, western, **3**: 52
 Douglas-fir, **1**: 80-W, 80-N
 Douglas-fir, bigcone, **1**: 79-W
 dwarf-mistletoe, hemlock, **2**:
 41
 elder, American, **4**: 136-NE,
 136-SE, 136-N; **5**: 137
 elder, blackbead, **3**: 187
 elder, blueberry, **3**: 185-NW,
 185-SW
 elder, Mexican, **3**: 86-N, 86-W
 elder, Pacific red, **2**: 81; **3**:
 184-N, 184-W
 elder, velvet, **3**: 188
 elephanttree, **3**: 25
 elliottia, **4**: 47
 elm, American, **1**: 196-N,
 196-W, 196-E; **5**: 149
 elm, cedar, **1**: 197-E; **5**: 150
 elm, rock, **1**: 200-E
 elm, September, **1**: 197.1-E
 elm, slippery, **1**: 198-W,
 198-E; **5**: 151
 elm, winged, **1**: 195-E; **5**: 148
 esenbeckia, Berlandier, **3**:
 69-N, 69-SW
 falsebox, **5**: 211
 false-mastic, **5**: 223
 fiddlewood, Berlandier, **3**:
 45-N, 45-SW
 fiddlewood, Florida, **5**: 182
 fig, Florida strangler, **5**: 204
 fig, shortleaf, **5**: 205
 fir, balsam, **1**: 2-N, 2-E
 fir, bristlecone, **1**: 3-W
 fir, California red, **1**: 8-W
 fir, Fraser, **1**: 4-E
 fir, grand, **1**: 6-W
 fir, noble, **1**: 9-W
 fir, Pacific silver, **1**: 1-W,
 1-N; **2**: 9
 fir, subalpine, **1**: 7-W, 7-N;
2: 10
 fir, white, **1**: 5-W
 fishpoison-tree, Florida, **5**: 229
 Florida-boxwood, **5**: 242
 Florida-privet, **4**: 51; **5**: 53
 forestiera, desert-olive, **3**: 74
 forestiera, Texas, **3**: 73-N,
 73-W
 franklinia, **4**: 52
 fremontia, California, **3**: 84
 fremontia, Mexican, **3**: 85
 fringetree, **4**: 34; **5**: 44
 gallberry, large, **4**: 65; **5**: 67
 Geiger-tree, **5**: 191
 gooseberry, swamp, **2**: 45
 graytwig, **5**: 243
 Guiana-plum, **5**: 198
 gumbo-limbo, **5**: 172
 hackberry, **1**: 121-W, 121-E
 hackberry, Georgia, **4**: 31;
5: 41
 hackberry, Lindheimer, **3**: 32
 hackberry, netleaf, **3**: 33-N,
 33-NW, 33-SW
 hawthorn, barberry, **6**: 2
 hawthorn, beautiful, **6**: 25
 hawthorn, Biltmore, **6**: 18
 hawthorn, black, **3**: 59-N,
 59-NW; **6**: 12
 hawthorn, blueberry, **6**: 3
 hawthorn, Brainerd, **6**: 4
 hawthorn, broadleaf, **6**: 11
 hawthorn, Cerro, **3**: 60; **6**: 13
 hawthorn, cocksbur, **6**: 10
 Hawthorn, Columbia, **3**: 58-N,
 58-NW; **6**: 8
 hawthorn, dotted, **6**: 26
 hawthorn, downy, **6**: 21
 hawthorn, fanleaf, **6**: 14

hawthorn, fireberry, **3:** 57;
6: 5
 hawthorn, fleshy, **3:** 62; **6:** 31
 hawthorn, frosted, **6:** 24
 hawthorn, green, **6:** 35
 hawthorn, Gregg, **6:** 15
 hawthorn, Harbison, **6:** 17
 hawthorn, Kansas, **6:** 9
 hawthorn, littlehip, **6:** 29
 hawthorn, May, **6:** 1
 hawthorn, oneflower, **6:** 34
 hawthorn, parsley, **6:** 20
 hawthorn, pear, **6:** 6
 hawthorn, Pensacola, **6:** 19
 hawthorn, Reverchon, **6:** 28
 hawthorn, riverflat, **6:** 22
 hawthorn, scarlet, **6:** 7
 hawthorn, Texas, **6:** 30
 hawthorn, threeflower, **6:** 33
 hawthorn, Tracy, **3:** 63; **6:** 32
 hawthorn, Washington, **6:** 23
 hawthorn, willow, **3:** 61; **6:** 27
 hawthorn, yellow, **6:** 16
 hazel, beaked, **3:** 54-N,
 54-NW; **4:** 44-N, 44-NE
 hemlock, Carolina, **1:** 94-E
 hemlock, eastern, **1:** 91-N,
 91-E
 hemlock, mountain, **1:** 93-W,
 93-N; **2:** 8
 hemlock, western, **1:** 92-W,
 92-N; **2:** 7
 Hercules-club, **4:** 165; **5:** 158
 Hercules-club, Texas, **4:** 166
 hickory, bitternut, **1:** 112-E;
5: 31
 hickory, black, **4:** 25
 hickory, mockernut, **1:** 117-E;
5: 35
 hickory, nutmeg, **1:** 116-E
 hickory, pignut, **1:** 113-E;
5: 33
 hickory, sand, **4:** 24; **5:** 34
 hickory, scrub, **4:** 23; **5:** 32
 hickory, shagbark, **1:** 118-N,
 118-E
 hickory, shellbark, **1:** 115-E
 hickory, water, **1:** 111-E;
5: 30
 holacantha, **3:** 88
 holly, American, **1:** 131-E;
5: 71
 holly, Carolina, **4:** 62; **5:** 65
 holly, Georgia, **5:** 158.2
 holly, sarvis, **4:** 63; **5:** 158.1
 holly, tawnyberry, **5:** 216
 honeylocust, **1:** 132-W,
 132-E; **5:** 59
 hopbush, **3:** 66-N, 66-SW;
5: 195
 hophornbeam, Chisos, **3:** 105
 hophornbeam, eastern, **1:**
 146-N, 146-W, 146-E;
5: 96
 hophornbeam, Knowlton, **3:**
 106
 hoptree, California, **3:** 129
 hoptree, common, **3:** 128-N,
 128-SW; **4:** 106-N,
 106-NE, 106-SE; **5:** 109
 hornbeam, American, **1:**
 109-N, 109-E; **5:** 29
 huajillo, **3:** 111-N, 111-SW
 huckleberry, red, **2:** 78
 hypelate, **5:** 215

 incense-cedar, **1:** 35-W
 inkwood, **5:** 203

 Jerusalem-thorn, **3:** 107
 joewood, **5:** 217
 Joshua-tree, **3:** 202
 juniper, alligator, **1:** 23-W,
 23-N
 juniper, Ashe, **1:** 21-W, 21-E
 juniper, California, **1:** 20-W
 juniper, common, **1:** 22-W,
 22-E, 22-N; **2:** 13
 juniper, creeping, **1:** 22.1-N,
 22.1-W, 22.1-E; **2:** 14
 juniper, drooping, **1:** 24-W,
 24-N
 juniper, oneseed, **1:** 25-W,
 25-N
 juniper, Pinchot, **1:** 28-W
 juniper, redberry, **3:** 36
 juniper, Rocky Mountain, **1:**
 30-W, 30-N
 juniper, Utah, **1:** 27-W
 juniper, western, **1:** 26-W

 kalmia, bog, **2:** 70
 kidneywood, **3:** 72-N, 72-W
 kidneywood, Texas, **3:** 71

 Labrador-tea, **2:** 72
 Labrador-tea, narrow-leaf, **2:**
 71
 larch, subalpine, **1:** 33-W
 larch, western, **1:** 34-W
 laurelcherry, Carolina, **4:** 98;
5: 106
 leadtree, great, **3:** 96-N,
 96-SW
 leadtree, littleleaf, **3:** 94
 leadwood, **5:** 218
 leatherleaf, **2:** 67
 licaria, Florida, **5:** 220
 lidflower, pale, **5:** 174
 lignumvitae, roughbark, **5:** 207
 lignumvitae, Texas, **3:** 87
 lololly-bay, **4:** 56; **5:** 60

 locust, black, **1:** 187-E
 locust, clammy, **4:** 124
 locust, Kelsey, **4:** 123
 locust, New Mexican, **3:** 162
 lyonia, tree, **4:** 76; **5:** 81
 Lyontree, **3:** 98
 lysiloma, Bahama, **5:** 221
 lysiloma, littleleaf, **3:** 97-N,
 97-SW

 madrone, Arizona, **3:** 18
 madrone, Pacific, **1:** 100-W
 madrone, Texas, **3:** 19
 magnolia, Ashe, **4:** 77; **5:** 83
 magnolia, bigleaf, **4:** 79
 magnolia, Fraser, **4:** 78
 magnolia, pyramid, **4:** 80;
5: 85
 magnolia, southern, **1:** 141-E;
5: 84
 magnolia, umbrella, **4:** 81; **5:**
 158.4
 mahogany, West Indies, **1:**
 192-E; **5:** 247
 maidenbush, **5:** 241
 manchineel, **5:** 214
 mangrove, **1:** 186-N, 186-E;
5: 238
 manzanita, Pringle, **3:** 20
 maple, bigleaf, **1:** 95-W, 95-N
 maple, bigtooth, **3:** 10
 maple, black, **1:** 97-E
 maple, chalk, **4:** 2; **5:** 15
 maple, Douglas, **2:** 59
 maple, Florida, **4:** 1; **5:** 14
 maple, mountain, **4:** 4-N,
 4-NE
 maple, red, **1:** 98-N, 98-E;
5: 17
 maple, Rocky Mountain, **3:**
 9-N, 9-W
 maple, silver, **1:** 101-E; **5:** 18
 maple, striped, **4:** 3-N, 3-NE
 maple, sugar, **1:** 99-N, 99-E
 maple, vine, **3:** 8
 marlberry, **5:** 167
 mayten, Florida, **5:** 224
 menziesia, rusty, **2:** 73
 mescalbean, **3:** 192-N,
 192-SW
 mesquite, **3:** 118-N, 118-SW
 mesquite, screwbean, **3:** 117
 Mexican-buckeye, **3:** 196
 milkbark, **5:** 196
 mountain-ash, American, **4:**
 141-N, 141-NE
 mountain-ash, Greene, **2:** 56;
3: 193-N, 193-W
 mountain-ash, showy, **4:**
 142-N, 142-NE
 mountain-ash, Sitka, **2:** 57;

3: 194-N, 194-W
mountain-cranberry, 2: 80
mountain-holly, 4: 89
mountain-laurel, 4: 75-NE,
75-SE; 5: 77
mulberry, red, 1: 139-W,
139-E; 5: 88
mulberry, Texas, 3: 99
myrtle-of-the-river, 5: 175

nannyberry, 3: 199; 4: 155
nectandra, Florida, 5: 227
nightshade, mullein, 4: 140-N,
140-SE; 5: 245
nolina, Bigelow, 3: 102

oak, Ajo, 3: 130
oak, Arizona white, 3: 131
oak, Arkansas, 4: 107; 5: 111
oak, bear, 4: 111
oak, black, 1: 183-E; 5: 127
oak, blackjack, 1: 171-E; 5:
119
oak, blue, 1: 160-W
oak, bluejack, 4: 113; 5: 115
oak, bur, 1: 172-W, 172-E
oak, California black, 1:
167-W
oak, California live, 1: 156-W
oak, California white, 1:
170-W
oak, canyon live, 1: 158-W
oak, Chapman, 4: 108; 5: 112
oak, chestnut, 1: 179-E
oak, chinkapin, 1: 173-W,
173-E; 5: 124
oak, Chisos, 3: 135
oak, Dunn, 3: 132
oak, Durand, 4: 109; 5: 113
oak, Emory, 1: 162-W
oak, Engelmann, 3: 133
oak, Gambel, 1: 164-W
oak, Georgia, 4: 110
oak, Graves, 3: 136
oak, gray, 3: 137
oak, Havard, 3: 138
oak, interior live, 3: 148
oak, island live, 3: 145
oak, Lacey, 3: 134
oak, lateleaf, 3: 136
oak, laurel, 1: 168-E; 5: 117
oak, live, 1: 184-N, 184-W,
184-E; 5: 128
oak, McDonald, 3: 140
oak, Mexican blue, 3: 142
oak, Mohr, 3: 141
oak, myrtle, 4: 115; 5: 121
oak, netleaf, 3: 143-N,
143-SW
oak, northern pin, 1: 163-E

oak, northern red, 1: 180-N,
180-E
oak, Nuttall, 1: 176-E
oak, Oglethorpe, 4: 116
oak, Oregon white, 1: 166-W
oak, overcup, 1: 169-E; 5: 118
oak, pin, 1: 177-E
oak, post, 1: 182-W, 182-E;
5: 126
oak, sandpaper, 3: 144
oak, scarlet, 1: 161-E
oak, shingle, 4: 112
oak, shrub live, 3: 147
oak, Shumard, 1: 181-W,
181-E; 5: 125
oak, silverleaf, 3: 139
oak, southern red, 1: 165-E;
5: 114
oak, swamp chestnut, 1:
174-E; 5: 120
oak, swamp white, 1: 159-E
oak, Toumey, 3: 146
oak, turkey, 4: 114; 5: 116
oak, water, 1: 175-E; 5: 122
oak, white, 1: 157-E; 5: 110
oak, willow, 1: 178-E; 5: 123
Osage-orange, 1: 138-W,
138-E
oysterwood, 5: 212

palmetto, cabbage, 1: 188-E;
5: 133
palmetto, dwarf, 4: 125; 5: 132
palmetto, Mexican, 3: 161-N,
161-SW
paloverde, blue, 3: 35
paloverde, border, 3: 36
paloverde, yellow, 3: 37
paradise-tree, 5: 244
paurotis-palm, 5: 161
pawpaw, 4: 16; 5: 23
pawpaw, smallflower, 5: 158.5
pecan, 1: 114-W, 114-E,
114-N
persimmon, common, 1:
123-E; 5: 49
persimmon, Texas, 3: 65
pigeon-plum, 5: 184
pinckneya, 4: 93; 5: 99
pine, Apache, 1: 55-W, 55-N
pine, bishop, 1: 63-W
pine, bristlecone, 1: 44-W
pine, Chihuahua, 1: 61-W,
61-N
pine, Coulter, 1: 51-W
pine, Digger, 1: 71-W
pine, eastern white, 1: 73-N,
73-E
pine, foxtail, 1: 45-W
pine, jack, 1: 46-N, 46-E
pine, Jeffrey, 1: 57-W

pine, knobcone, 1: 48-W
pine, limber, 1: 56-W, 56-N
pine, loblolly, 1: 75-E; 5: 10
pine, lodgepole, 1: 50-W,
50-N; 2: 2
pine, longleaf, 1: 65-E; 5: 8
pine, Monterey, 1: 68-W
pine, pitch, 1: 71-E
pine, pond, 1: 74-E; 5: 9
pine, ponderosa, 1: 64-W,
64-N
pine, red, 1: 69-N, 69-E
pine, sand, 1: 49-E; 5: 4
pine, shortleaf, 1: 52-E; 5: 5
pine, slash, 1: 54-E; 5: 6
pine, southwestern white, 1:
72-W, 72-N
pine, spruce, 1: 58-E; 5: 7
pine, sugar, 1: 59-W
pine, Table-Mountain, 1: 66-E
pine, Torrey, 1: 76-W
pine, Virginia, 1: 77-E
pine, Washoe, 1: 78-W
pine, western white, 1: 62-W
pine, whitebark, 1: 43-W,
43-N
pinyon, 1: 53-W
pinyon, Mexican, 1: 47-W,
47-N
pinyon, Parry, 1: 67-W
pinyon, singleleaf, 1: 60-W
pisonia, 5: 230
pistache, Texas, 3: 108
planertree, 4: 94; 5: 100
plum, Allegheny, 4: 96
plum, American, 3: 119-NW,
119-SW; 4: 95-NE, 95-SE;
5: 104
plum, Canada, 4: 102
plum, Chickasaw, 3: 120; 4:
97; 5: 105
plum, flatwoods, 4: 105; 5: 108
plum, hortulan, 4: 99
plum, Klamath, 3: 126
plum, Mexican, 4: 100-N,
100-SE
plum, wildgoose, 4: 101
poinciana, Mexican, 3: 27-N,
27-SW
poison-sumac, 4: 152-NE,
152-SE; 5: 147
poisontree, Florida, 5: 225
pond-apple, 5: 166
poplar, balsam, 1: 148-N,
148-W, 148-E; 2: 15
Port-Orford-cedar, 1: 10-W
possumhaw, 4: 66; 5: 68
prickly-ash, Biscayne, 5: 254
prickly-ash, common, 4: 163
prickly-ash, lime, 4: 164-N,
164-SE; 5: 255

princewood, **5**: 202
 rapanea, Florida, **5**: 236
 raspberry, American red, **2**: 53
 redbay, **4**: 92; **5**: 98
 redbud, California, **3**: 39
 redbud, eastern, **3**: 38-N,
 38-SW; **4**: 33-N, 33-NE,
 33-SE; **5**: 43
 redcedar, eastern, **1**: 31-W,
 31-E; **5**: 3
 redcedar, southern, **1**: 29-E;
5: 2
 redcedar, western, **1**: 90-W,
 90-N; **2**: 11
 redwood, **1**: 81-W
 rhododendron, Catawba, **4**:
 118
 rhododendron, Pacific, **3**: 152
 rhododendron, rosebay, **4**: 119
 rosebay, Lapland, **2**: 74
 rose, prickly, **2**: 51
 rose, Nootka, **2**: 52
 royalpalm, Florida, **5**: 239

 saffron-plum, **3**: 23-N,
 23-SW; **5**: 171
 sagebrush, big, **3**: 21-NW,
 21-SW
 saguaro, **3**: 44
 salal, **2**: 69
 salmonberry, **2**: 55
 sapium, jumping-bean, **3**: 190
 sassafras, **1**: 191-E; **5**: 138
 satinleaf, **5**: 181
 satinwood, West Indies, **5**:
 256
 saw-palmetto, **4**: 137; **5**: 139
 scarletbush, **5**: 213
 seagrape, **5**: 185
 sequoia, giant, **1**: 82-W
 serviceberry, downy, **4**: 11-N,
 11-NE, 11-SE; **5**: 21
 serviceberry, inland, **4**: 13
 serviceberry, roundleaf, **4**: 14
 serviceberry, Utah, **3**: 17
 serviceberry, western, **2**: 48;
3: 16-N, 16-NW; **4**: 12-N,
 12-NE
 seven-year-apple, **5**: 206
 silktassel, wavyleaf, **3**: 86
 silverbell, Carolina, **4**: 58;
5: 61
 silverbell, little, **4**: 60; **5**: 63
 silverbell, two-wing, **4**: 59;
5: 62
 silverberry, **2**: 60
 silverpalm, Florida, **5**: 186
 smokethorn, **3**: 64
 smoketree, American, **4**: 46

 snowbell, American, **4**: 148;
5: 142
 snowbell, bigleaf, **4**: 149;
5: 143
 snowbell, sycamore-leaf, **4**: 150

 soapberry, western, **3**: 189;
4: 138
 soapberry, wingleaf, **4**: 139;
5: 240
 soldierwood, **5**: 189
 sophora, Texas, **4**: 145
 sourwood, **4**: 91; **5**: 97
 sparkleberry, tree, **4**: 154;
5: 152
 spirea, Beauverd, **2**: 58
 spruce, black, **1**: 38-N, 38-E;
2: 4
 spruce, blue, **1**: 40-W
 spruce, Brewer, **1**: 36-W
 spruce, Engelmann, **1**: 37-W,
 37-N
 spruce, red, **1**: 41-N, 41-E
 spruce, Sitka, **1**: 42-W,
 42-N; **2**: 6
 spruce, white, **1**: 39-W, 39-E,
 39-N; **2**: 5
 stewartia, mountain, **4**: 147
 stewartia, Virginia, **4**: 146;
5: 141
 stopper, boxleaf, **5**: 200
 stopper, long-stalk, **5**: 235
 stopper, red, **5**: 201
 stopper, redberry, **5**: 199
 stopper, twinberry, **5**: 226
 stopper, white, **5**: 198
 strongbark, Bahama, **5**: 169
 strongbark, rough, **5**: 170
 sugarberry, **1**: 122-W, 122-E,
 122-N; **5**: 40
 sumac, Kearney, **3**: 156
 sumac, laurel, **3**: 157
 sumac, lemonade, **3**: 154
 sumac, littleleaf, **3**: 159
 sumac, Mearns, **3**: 153
 sumac, prairie, **3**: 158-N,
 158-SW
 sumac, shining, **4**: 120-N,
 120-SE; **5**: 130
 sumac, smooth, **3**: 155-NW,
 155-SW; **4**: 121-NE,
 121-SE; **5**: 131
 sumac, staghorn, **4**: 122-N,
 122-NE
 sumac, sugar, **3**: 160
 swamp-privet, **4**: 50; **5**: 52
 sweetbay, **1**: 142-E; **5**: 86
 sweetgale, **2**: 33
 sweetgum, **1**: 135-N, 135-E;
5: 79

 sweetleaf, common, **4**: 151;
5: 144
 sycamore, **5**: 101
 sycamore, American, **1**:
 147-W, 147-E, 147-N;
5: 101
 sycamore, Arizona, **3**: 113
 sycamore, California, **3**: 112

 tallowwood, **5**: 253
 tamarack, **1**: 32-N, 32-E;
2: 3
 tanoak, **1**: 136-W
 tesota, **3**: 103
 tetrazygia, Florida, **5**: 248
 thatchpalm, Florida, **5**: 250
 thatchpalm, key, **5**: 249
 thimbleberry, western, **2**: 54
 torchwood, **5**: 165
 torchwood, balsam, **5**: 164
 torreyia, California, **1**: 87-W
 torreyia, Florida, **1**: 88-E;
5: 13
 tree-cactus, key, **5**: 179
 trema, Florida, **5**: 252
 trema, West Indies, **5**: 251
 tupelo, black, **1**: 144-N,
 144-E; **5**: 94
 tupelo, Ogeechee, **1**: 145-E;
5: 93
 tupelo, water, **1**: 143-E; **5**: 92

 vauquelinia, fewflower, **3**: 198
 vauquelinia, Torrey, **3**: 197
 velvetseed, elliptic-leaf, **5**: 209
 velvetseed, roughleaf, **5**: 210
 viburnum, possumhaw, **4**:
 156; **5**: 153
 viburnum, Walter, **4**: 157;
5: 154

 wahoo, eastern, **4**: 49-NE,
 49-SE
 wahoo, western, **3**: 70
 walnut, Arizona, **3**: 92-N,
 92-SW
 walnut, black, **1**: 134-E; **5**: 76
 walnut, California, **3**: 90
 walnut, Hinds, **3**: 91
 walnut, little, **3**: 93
 washingtonia, California, **3**:
 201
 waterlocust, **4**: 55; **5**: 58
 white-cedar, Atlantic, **1**:
 11-E; **5**: 1
 white-cedar, northern, **1**:
 81-N, 81-E
 white-mangrove, **5**: 219
 wild-dilly, **5**: 222
 willow, arroyo, **3**: 174-NW,
 174-SW

- willow, balsam, **4**: 134-N, 134-NE
- willow, Barclay, **2**: 20
- willow, Bebb, **2**: 21; **3**: 165-N, 165-NW, 165-SW; **4**: 127-N, 127-NE
- willow, black, **1**: 190-N, 190-W, 190-E; **3**: 177-N, 177-NW, 177-SW; **5**: 136
- willow, Bonpland, **3**: 166-N, 166-SW
- willow, Coastal Plain, **4**: 126; **5**: 134
- willow, coyote, **3**: 168-NW, 168-SW, 168-N; **4**: 129-NE, 129-SE, 129-N
See also willow, sandbar.
- willow, diamondleaf, **2**: 29
- willow, feltleaf, **2**: 18, **3**: 163-N
- willow, Florida, **4**: 130; **5**: 135
- willow, Geyer, **3**: 170
- willow, grayleaf, **2**: 22
- willow, Hinds, **3**: 171
- willow, Hooker, **2**: 23; **3**: 172-N, 172-W
- willow, littletree, **2**: 19; (**3**: 164-N)
- willow, Mackenzie, **3**: 175-N, 175-W
- willow, meadow, **3**: 178-N, 178-NW; **4**: 133-N, 133-NE
- willow, netleaf, **2**: 30
- willow, northwest, **3**: 180
- willow, Pacific, **2**: 26; **3**: 173-N, 173-W
- willow, park, **2**: 27
- willow, peachleaf, **1**: 189-W, 189-E, 189-N; (**3**: 164-N)
- willow, pussy, **3**: 167-N, 167-NW; **4**: 128-N, 128-NE
- willow, red, **3**: 176
- willow, Richardson, **2**: 25
- willow, river, **3**: 169
- willow, sandbar, **2**: 24
See also willow, coyote.
- willow, satiny, **4**: 132-N, 132-NE
- willow, Scouler, **2**: 31; **3**: 179-N, 179-W
- willow, shining, **4**: 131-N, 131-NE
- willow, silky, **4**: 135-N, 135-NE
- willow, Sitka, **2**: 32; **3**: 182-N, 182-W
- willow, tall blueberry, **2**: 28
- willow, Tracy, **3**: 181
- willow, yewleaf, **3**: 183-N, 183-SW
- winterberry, common, **4**: 70-N, 70-NE, 70-SE; **5**: 72
- winterberry, mountain, **4**: 68; **5**: 69
- winterberry, smooth, **4**: 67
- witch-hazel, **4**: 61-N, 61-NE, 61-SE; **5**: 64
- yaupon, **4**: 71-N, 71-SE; **5**: 73
- yellow-poplar, **1**: 137-E; **5**: 80
- yellowwood, **4**: 35
- yew, Canada, **1**: 86.1-N, 86.1-E
- yew, Florida, **1**: 85-E; **5**: 12
- yew, Pacific, **1**: 86-W, 86-N; **2**: 1
- yucca, aloe, **4**: 161; **5**: 156
- yucca, beaked, **3**: 207
- yucca, Carneros, **3**: 203
- yucca, Faxon, **3**: 205
- yucca, Mohave, **3**: 206
- yucca, moundlily, **4**: 162; **5**: 157
- yucca, Schotts, **3**: 208
- yucca, soaptree, **3**: 204
- yucca, Torrey, **3**: 209
- yucca, Trecul, **3**: 210

INDEX OF SCIENTIFIC NAMES, VOLUMES 1-6

This index contains the species maps in all 6 volumes. Numbers refer to maps, which are unpagged. Volume numbers are in heavy (boldface) type followed by a colon. Map numbers are in ordinary (roman) type.

- Abies amabilis*, **1**: 1-W,
1-N; **2**: 9.
Abies balsamea, **1**: 2-N, 2-E
Abies bracteata, **1**: 3-W
Abies concolor, **1**: 5-W
Abies fraseri, **1**: 4-E
Abies grandis, **1**: 6-W
Abies lasiocarpa, **1**: 7-W,
7-N; **2**: 10
Abies magnifica, **1**: 8-W
Abies procera, **1**: 9-W
Acacia berlandieri, **3**: 1-N,
1-SW
Acacia choriophylla, **5**: 159
Acacia farnesiana, **3**: 2
Acacia greggii, **3**: 3
Acacia macracantha, **5**: 160
Acacia rigidula, **3**: 4
Acacia roemerana, **3**: 5
Acacia tortuosa, **3**: 6-N,
6-SW
Acacia wrightii, **3**: 7
Acer barbatum, **4**: 1; **5**: 14
Acer circinatum, **3**: 8
Acer glabrum, **3**: 9-N, 9-W
Acer glabrum var. *douglasii*,
2: 59
Acer grandidentatum, **3**: 10
Acer leucoderme, **4**: 2; **5**: 15
Acer macrophyllum, **1**:
95-W, 95-N
Acer negundo, **1**: 96-W,
96-E, 96-N; **5**: 16
Acer nigrum, **1**: 97-E
Acer pensylvanicum **4**: 3-N,
3-NE
Acer rubrum, **1**: 98-N, 98-E;
5: 17
Acer saccharinum, **1**: 101-E;
5: 18
Acer saccharum, **1**: 99-N,
99-E
Acer spicatum, **4**: 4-N, 4-NE
Acoelorrhaphe wrightii, **5**:
161
Aesculus californica, **3**: 11
Aesculus glabra, **1**: 102-E
Aesculus octandra, **1**: 103-E
Aesculus parviflora, **4**: 5
Aesculus pavia, **4**: 6; **5**: 19
Aesculus sylvatica, **4**: 7
Alnus crispa, **2**: 37
Alnus maritima, **4**: 8
Alnus oblongifolia, **3**: 12
Alnus rhombifolia, **3**: 13
Alnus rubra, **1**: 104-W,
104-N; **2**: 39
Alnus rugosa, **4**: 9-N, 9-NE
Alnus serrulata, **4**: 10-NE,
10-SE, 10-N; **5**: 20
Alnus sinuata, **2**: 38; **3**:
14-N, 14-W
Alnus tenuifolia, **2**: 40;
15-N, 15-W
Alvaradoa amorphoides, **5**:
162
Amelanchier alnifolia, **2**: 48;
3: 16-N, 16-NW; **4**: 12-N,
12-NE
Amelanchier arborea, **4**:
11-N, 11-NE, 11-SE; **5**:
21
Amelanchier interior, **4**: 13
Amelanchier sanguinea, **4**: 14
Amelanchier utahensis, **3**: 17
Amphitecna latifolia, **5**: 163
Amyris balsamifera, **5**: 164
Amyris elemifera, **5**: 165
Andromeda polifolia, **2**: 65
Annona glabra, **5**: 166
Aralia spinosa, **4**: 15; **5**: 22
Arbutus arizonica, **3**: 18
Arbutus menziesii, **1**: 100-W
Arbutus texana, **3**: 19
Arceuthobium tsugense, **2**: 41
Arctostaphylos pringlei, **3**: 20
Arctostaphylos uva-ursi, **2**: 66
Ardisia escallonioides, **5**: 167
Artemisia tridentata, **3**:
21-NW, 21-SW
Asimina parviflora, **5**: 158.5
Asimina triloba, **4**: 16; **5**: 23
Avicennia germinans, **4**:
17-N, 17-SW; **5**: 168
Baccharis halimifolia, **4**:
18-NE, 18-SE; **5**: 24
Betula alleghaniensis, **1**:
105-N, 105-E
Betula glandulosa, **2**: 35
Betula lenta, **1**: 106-E
Betula nana, **2**: 34
Betula nigra, **1**: 110-E; **5**: 25
Betula occidentalis, **3**: 22-N,
22-NW
Betula papyrifera, **1**: 107-N,
107-W, 107-E; **2**: 36
Betula populifolia, **1**: 108-N,
108-E
Betula uber, **4**: 19
Bourreria ovata, **5**: 169
Bourreria radula, **5**: 170
Bumelia celastrina, **3**: 23-N,
23-SW; **5**: 171
Bumelia lanuginosa, **3**: 24;
4: 20; **5**: 26
Bumelia lycioides, **4**: 21; **5**:
27
Bumelia tenax, **4**: 22; **5**: 28
Bursera fagaroides, **3**: 26-N,
26-SW
Bursera microphylla, **3**: 25
Bursera simaruba, **5**: 172
Byrsonima lucida, **5**: 173
Caesalpinia mexicana, **3**:
27-N, 27-SW
Calyptanthes pallens, **5**: 174
Calyptanthes zuzygium, **5**:
175
Canella winterana, **5**: 176
Canotia holocantha, **3**: 28
Capparis cynophallophora,
5: 177
Capparis flexuosa, **5**: 178
Carpinus caroliniana, **1**:
109-N, 109-E; **5**: 29
Carya aquatica, **1**: 111-E;
5: 30
Carya cordiformis, **1**: 112-E;
5: 31
Carya floridana, **4**: 23; **5**: 32
Carya glabra, **1**: 113-E; **5**:
33
Carya illinoensis, **1**: 114-W,
114-E, 114-N
Carya laciniata, **1**: 115-E
Carya myristiciformis, **1**:
116-E
Carya ovata, **1**: 118-N, 118-E
Carya pallida, **4**: 24; **5**: 34
Carya texana, **4**: 25
Carya tomentosa, **1**: 117-E;
5: 35
Castanea alnifolia, **4**: 26; **5**:
36
Castanea dentata, **4**: 27-NE,
27-SE; **5**: 37
Castanea ozarkensis, **4**: 28
Castanea pumila, **4**: 29; **5**: 38
Castanopsis chrysophylla, **1**:
119-W
Catalpa bignonioides, **4**: 30;
5: 39

- Catalpa speciosa*, **1**: 120-E
Ceanothus arboreus, **3**: 29
Ceanothus spinosus, **3**: 30
Ceanothus thyrsiflorus, **3**: 31
Celtis laevigata, **1**: 122-W,
122-E; **5**: 40
Celtis lindheimeri, **3**: 32
Celtis occidentalis, **1**:
121-W, 121-E
Celtis reticulata, **3**: 33-N,
33-NW, 33-SW
Celtis tenuifolia, **4**: 31; **5**: 41
Cephalanthus occidentalis,
3: 34-NW, 34-SW, 34-N;
4: 32-NE, 32-SE, 32-N;
5: 42
Cercidium floridum, **3**: 35
Cercidium macrum, **3**: 36
Cercidium microphyllum, **3**:
37
Cercis canadensis, **3**: 38-N,
38-SW; **4**: 33-NE, 33-SE,
33-N; **5**: 43
Cercis occidentalis, **3**: 39
Cercocarpus betuloides, **3**: 40
Cercocarpus breviflorus, **3**: 41
Cercocarpus ledifolius, **3**: 42
Cercocarpus traskiae, **3**: 43
Cereus giganteus, **3**: 44
Cereus robinii, **5**: 179
Chamaecyparis lawsoniana,
1: 10-W
Chamaecyparis nootkatensis,
1: 12-W, 12-N; **2**: 12
Chamaecyparis thyoides, **1**:
11-E; **5**: 1
Chamaedaphne calyculata,
2: 67
Chilopsis linearis, **3**: 49
Chionanthus virginicus, **4**:
34; **5**: 44
Chrysobalanus icaco, **5**: 180
Chrysophyllum oliviforme, **5**:
181
Citharexylum berlandieri, **3**:
45-N, 45-SW
Citharexylum fruticosum, **5**:
182
Cladothamnus pyroliflorus,
2: 68
Cladrastis kentukea, **4**: 35
Clethra acuminata, **4**: 36
Cliftonia monophylla, **4**: 37;
5: 45
Clusia rosea, **5**: 183
Coccoloba diversifolia, **5**:
184
Coccoloba uvifera, **5**: 185
Coccothrinax argentata, **5**:
186
Colubrina arborescens, **5**: 187
Colubrina cubensis, **5**: 188
Colubrina elliptica, **5**: 189
Condalia globosa, **3**: 46
Condalia hookeri, **3**: 47
Conocarpus erectus, **5**: 190
Cordia boissieri, 48-N,
48-SW
Cordia sebestena, **5**: 191
Cornus alternifolia, **4**:
38-NE, 38-SE, 38-N; **5**:
46
Cornus drummondii, **4**: 39
Cornus florida, **1**: 124-N,
124-E; **5**: 47
Cornus glabrata, **3**: 50
Cornus nuttallii, **3**: 51-NW,
51-SW
Cornus occidentalis, **3**: 52
Cornus racemosa, **4**: 41
Cornus rugosa, **4**: 40-N,
40-NE
Cornus sessilis, **3**: 56
Cornus stolonifera, **2**: 63; **3**:
53-N, 53-NW, 53-SW; **4**:
43-N, 43-NE
Cornus stricta, **4**: 42; **5**: 158.6
Corylus cornuta, **3**: 54-N,
54-NW; **4**: 44-N, 44-NE
Cotinus obovatus, **4**: 46
Cowania mexicana, **3**: 55-N,
55-SW
Crataegus aestivalis, **6**: 1
Crataegus berberifolia, **6**: 2
Crataegus brachyacantha,
6: 3
Crataegus brainerdii, **6**: 4
Crataegus calpodendron, **6**: 6
Crataegus chrysocarpa, **3**: 57;
6: 5
Crataegus coccinea, **6**: 7
Crataegus coccinioides, **6**: 9
Crataegus columbiana, **3**:
58-N, 58-NW; **6**: 8
Crataegus crus-galli, **6**: 10
Crataegus dilatata, **6**: 11
Crataegus douglasii, **3**: 59-N,
59-NW; **6**: 12
Crataegus erythropoda, **3**:
60; **6**: 13
Crataegus flabellata, **6**: 14
Crataegus flava, **6**: 16
Crataegus greggiana, **6**: 15
Crataegus harbisonii, **6**: 17
Crataegus intricata, **6**: 18
Crataegus lacrimata, **6**: 19
Crataegus marshallii, **6**: 20
Crataegus mollis, **6**: 21
Crataegus opaca, **6**: 22
Crataegus phaenopyrum,
6: 23
Crataegus pruinosa, **6**: 24
Crataegus pulcherrima, **6**: 25
Crataegus punctata, **6**: 26
Crataegus reverchonii, **6**: 28
Crataegus saligna, **3**: 61; **6**:
27
Crataegus spathulata, **6**: 29
Crataegus succulenta, **3**: 62;
6: 31
Crataegus texana, **6**: 30
Crataegus tracyi, **3**: 63; **6**: 32
Crataegus triflora, **6**: 33
Crataegus uniflora, **6**: 34
Crataegus viridis, **6**: 35
Crossopetalum rhacoma, **5**:
192
Cupania glabra, **5**: 193
Cupressus arizonica, **1**: 13-W
Cupressus bakeri, **1**: 14-W
Cupressus goveniana, **1**:
15-W
Cupressus guadalupensis, **1**:
16-W
Cupressus macnabiana, **1**:
17-W
Cupressus macrocarpa, **1**:
18-W
Cupressus sargentii, **1**: 19-W
Cyrilla racemiflora, **4**: 45-N,
45-SE; **5**: 48

Dalea spinosa, **3**: 64
Diospyros texana, **3**: 65
Diospyros virginiana, **1**:
123-E; **5**: 49
Dipholis salicifolia, **5**: 194
Dodonaea viscosa, **3**: 66-N,
66-SW; **5**: 195
Drypetes diversifolia, **5**: 196
Drypetes lateriflora, **5**: 197

Ehretia anacua, **3**: 67-N,
67-SW
Elaeagnus commutata, **2**: 60
Elliottia racemosa, **4**: 47
Empetrum nigrum, **2**: 64
Erythrina flabelliformis, **3**:
68-N, 68-SW
Erythrina herbacea, **4**: 48-N,
48-SE; **5**: 50
Esenbeckia berlandieri, **3**:
69-N, 69-SW
Eugenia axillaris, **5**: 198
Eugenia confusa, **5**: 199
Eugenia foetida, **5**: 200
Eugenia rhombea, **5**: 201
Euonymus atropurpureus, **4**:
49-NE, 49-SE; **5**: 158.3
Euonymus occidentalis, **3**: 70
Exostema caribaeum, **5**: 202
Exothea paniculata, **5**: 203
Eysenhardtia polystachya, **3**:
72-N, 72-W

- Eysenhardtia texana*, 3: 71
- Fagus grandifolia*, 1: 125-N, 125-E; 5: 51
- Ficus aurea*, 5: 204
- Ficus citrifolia*, 5: 205
- Forestiera acuminata*, 4: 50; 5: 52
- Forestiera angustifolia*, 3: 73-N, 73-W
- Forestiera phillyreoides*, 3: 74
- Forestiera segregata*, 4: 51; 5: 53
- Franklinia alatamaha*, 4: 52
- Fraxinus americana*, 1: 126-N, 126-E; 5: 54
- Fraxinus anomala*, 3: 75
- Fraxinus berlandierana*, 3: 76
- Fraxinus caroliniana*, 4: 53; 5: 55
- Fraxinus cuspidata*, 3: 77
- Fraxinus dipetala*, 3: 78
- Fraxinus gooddingii*, 3: 79
- Fraxinus greggii*, 3: 80-N, 80-SW
- Fraxinus latifolia*, 1: 127-W
- Fraxinus nigra*, 1: 129-N, 129-E
- Fraxinus papillosa*, 3: 81
- Fraxinus pennsylvanica*, 1: 130-W, 130-E, 130-N; 5: 56
- Fraxinus profunda*, 4: 54; 5: 57
- Fraxinus quadrangulata*, 1: 128-E
- Fraxinus texensis*, 3: 82
- Fraxinus velutina*, 3: 83
- Fremontodendron californicum*, 3: 84
- Fremontodendron mexicanum*, 3: 85
- Gaultheria shallon*, 2: 69
- Garrya elliptica*, 3: 86
- Genipa clusiifolia*, 5: 206
- Gleditsia aquatica*, 4: 55; 5: 58
- Gleditsia triacanthos*, 1: 132-W, 132-E; 5: 59
- Gordonia lasianthus*, 4: 56; 5: 60
- Guaiacum angustifolium*, 3: 87
- Guaiacum sanctum*, 5: 207
- Guapira discolor*, 5: 208
- Guettarda elliptica*, 5: 209
- Guettarda scabra*, 5: 210
- Gyminda latifolia*, 5: 211
- Gymnanthes lucida*, 5: 212
- Gymnocladus dioicus*, 4: 57
- Halesia carolina*, 4: 58; 5: 61
- Halesia diptera*, 4: 59; 5: 62
- Halesia parviflora*, 4: 60; 5: 63
- Hamamelis virginiana*, 4: 61-N, 61-NE, 61-SE; 5: 64
- Hamelia patens*, 5: 213
- Helietta parvifolia*, 3: 89-N, 89-SW
- Hippomane mancinella*, 5: 214
- Holacantha emoryi*, 3: 88
- Hypelate trifoliata*, 5: 215
- Ilex ambigua*, 4: 62; 5: 65
- Ilex amelanchier*, 4: 63; 5: 158.1
- Ilex cassine*, 4: 64-N, 64-SE; 5: 66
- Ilex coriacea*, 4: 65; 5: 67
- Ilex decidua*, 4: 66; 5: 68
- Ilex krugiana*, 5: 216
- Ilex laevigata*, 4: 67
- Ilex longipes*, 5: 158.2
- Ilex montana*, 4: 68; 5: 69
- Ilex myrtifolia*, 4: 69; 5: 70
- Ilex opaca*, 1: 131-E; 5: 71
- Ilex verticillata*, 4: 70-N, 70-NE, 70-SE; 5: 72
- Ilex vomitoria*, 4: 71-N, 71-SE; 5: 73
- Illicium floridanum*, 4: 72-N, 72-NE; 5: 74
- Illicium parviflorum*, 4: 73; 5: 75
- Jacquinia keyensis*, 5: 217
- Juglans californica*, 3: 90
- Juglans cinerea*, 1: 133-E
- Juglans hindsii*, 3: 91
- Juglans major*, 3: 92-N, 92-SW
- Juglans microcarpa*, 3: 93
- Juglans nigra*, 1: 134-E; 5: 76
- Juniperus ashei*, 1: 21-W, 21-E
- Juniperus californica*, 1: 20-W
- Juniperus communis*, 1: 22-W, 22-E, 22-N; 2: 13
- Juniperus deppeana*, 1: 23-W, 23-N
- Juniperus erthrocarpa*, 6: 36
- Juniperus flaccida*, 1: 24-W, 24-N
- Juniperus horizontalis*, 1: 22.1-N, 22.1-W, 22.1-E; 2: 14
- Juniperus monosperma*, 1: 25-W, 25-N
- Juniperus occidentalis*, 1: 26-W
- Juniperus osteosperma*, 1: 27-W
- Juniperus pinchotii*, 1: 28-W
- Juniperus scopulorum*, 1: 30-W, 30-N
- Juniperus silicicola*, 1: 29-E; 5: 2
- Juniperus virginiana*, 1: 31-W, 31-E; 5: 3
- Kalmia latifolia*, 4: 76; 5: 77
- Kalmia polifolia*, 2: 70
- Koerberlinia spinosa*, 3: 95-N, 95-SW
- Krugiodendron ferreum*, 5: 218
- Laguncularia racemosa*, 5: 219
- Larix laricina*, 1: 32-N, 32-E; 2: 3
- Larix lyallii*, 1: 33-W
- Larix occidentalis*, 1: 34-W
- Ledum decumbens*, 2: 71
- Ledum groenlandicum*, 2: 72
- Leitneria floridana*, 4: 74; 5: 78
- Leucaena pulverulenta*, 3: 96-N, 96-SW
- Leucaena retusa*, 3: 94
- Libocedrus decurrens*, 1: 35-W
- Licaria triandra*, 5: 220
- Liquidambar styraciflua*, 1: 135-N, 135-E; 5: 79
- Liriodendron tulipifera*, 1: 137-E; 5: 80
- Lithocarpus densiflorus*, 1: 136-W
- Lyonia ferruginea*, 4: 75-NE, 75-SE; 5: 81
- Lyonothamnus floribundus*, 3: 98
- Lysiloma latisiliquum*, 5: 221
- Lysiloma microphyllum*, 3: 97-N, 97-SW
- Maclura pomifera*, 1: 138-W, 138-E
- Magnolia acuminata*, 1: 140-E; 5: 82
- Magnolia ashei*, 4: 77; 5: 83
- Magnolia fraseri*, 4: 78
- Magnolia grandiflora*, 1: 141-E; 5: 84
- Magnolia macrophylla*, 4: 79
- Magnolia pyramidata*, 4: 80; 5: 85
- Magnolia tripetala*, 4: 81; 5: 158.4

- Magnolia virginiana*, 1: 142-E; 5: 86
Malus angustifolia, 4: 82; 5: 87
Malus coronaria, 4: 83
Malus diversifolia, 2: 49; 3: 100-N, 100-W
Malus ioensis, 4: 84
Manilkara bahamensis, 5: 222
Mastichodendron foetidissimum, 5: 223
Maytenus phyllanthoides, 5: 224
Menziesia ferruginea, 2: 74
Metopium toxiferum, 5: 225
Morus microphylla, 3: 99
Morus rubra, 1: 139-W, 139-E; 5: 88
Myrcianthes fragrans, 5: 226
Myrica californica, 3: 101
Myrica cerifera, 4: 85; 5: 89
Myrica gale, 2: 33
Myrica heterophylla, 4: 86; 5: 90
Myrica inodora, 4: 87; 5: 91
Myrica pennsylvanica, 4: 88-N, 88-NE

Nectandra coriacea, 5: 227
Nemopanthus collinus, 4: 89
Nolina bigelovii, 3: 102
Nyssa aquatica, 1: 143-E, 5: 92
Nyssa ogeche, 1: 145-E; 5: 93
Nyssa sylvatica, 1: 144-N, 144-E; 5: 94

Olneya tesota, 3: 103
Oplopanax horridus, 2: 62
Opuntia fulgida, 3: 104
Osmanthus americanus, 4: 90; 5: 95
Ostrya chisosensis, 3: 105
Ostrya knowltonii, 3: 106
Ostrya virginiana, 1: 146-N, 146-W, 146-E; 5: 96
Oxydendrum arboreum, 4: 91; 5: 97

Parkinsonia aculeata, 3: 107
Persea borbonia, 4: 92; 5: 98
Photinia arbutifolia, 3: 109-NW, 109-SW
Picea brewerana, 1: 36-W
Picea engelmannii, 1: 37-W, 37-N
Picea glauca, 1: 39-W, 39-E, 39-N; 2: 5
Picea mariana, 1: 38-N, 38-E; 2: 4
Picea pungens, 1: 40-W

Picea rubens, 1: 41-N, 41-E
Picea sitchensis, 1: 42-W, 42-N; 2: 6
Picramnia pentandra, 5: 228
Pinckneya pubens, 4: 93; 5: 99
Pinus albicaulis, 1: 43-W, 43-N
Pinus aristata, 1: 44-W
Pinus attenuata, 1: 48-W
Pinus balfouriana, 1: 45-W
Pinus banksiana, 1: 46-N, 46-E
Pinus cembroides, 47-W, 47-N
Pinus clausa, 1: 49-E; 5: 4
Pinus contorta, 1: 50-W, 50-N; 2: 2
Pinus coulteri, 1: 51-W
Pinus echinata, 1: 52-E; 5: 5
Pinus edulis, 1: 53-W
Pinus elliotii, 1: 54-E; 5: 6
Pinus engelmannii, 1: 55-W, 55-N
Pinus flexilis, 1: 56-W, 56-N
Pinus glabra, 1: 58-E; 5: 7
Pinus jeffreyi, 1: 57-W
Pinus lambertiana, 1: 59-W
Pinus leiophylla, 1: 61-W, 61-N
Pinus monophylla, 1: 60-W
Pinus monticola, 1: 62-W
Pinus muricata, 1: 63-W
Pinus palustris, 1: 65-E; 5: 8
Pinus ponderosa, 1: 64-W, 64-N
Pinus pungens, 1: 66-E
Pinus quadrifolia, 1: 67-W
Pinus radiata, 1: 68-W
Pinus resinosa, 1: 69-N, 69-E
Pinus rigida, 1: 71-E
Pinus sabiniana, 1: 70-W
Pinus serotina, 1: 74-E; 5: 9
Pinus strobiformis, 1: 72-W, 72-N
Pinus strobus, 1: 73-N, 73-E
Pinus taeda, 1: 75-E; 5: 10
Pinus torreyana, 1: 76-W
Pinus virginiana, 1: 77-E
Pinus washoensis, 1: 78-W
Piscidia piscipula, 5: 229
Pisonia rotundata, 5: 230
Pistacia texana, 3: 108
Pithecellobium flexicaule, 3: 110-N, 110-SW
Pithecellobium guadalupense, 5: 231
Pithecellobium pallens, 3: 111-N, 111-SW

Pithecellobium unguis-cati, 5: 232
Planera aquatica, 4: 94; 5: 100
Platanus occidentalis, 1: 147-W, 147-E, 147-N; 5: 101
Platanus racemosa, 3: 112
Platanus wrightii, 3: 113
Populus angustifolia, 3: 114
Populus arizonica, 3: 115
Populus balsamifera, 1: 148-N, 148-W, 148-E; 2: 15
Populus deltoides, 1: 149-W, 149-E; 5: 102
Populus fremontii, 1: 150-W
Populus grandidentata, 1: 152-N, 152-E
Populus heterophylla, 1: 151-E; 5: 103
Populus hinckleyana, 3: 116
Populus tremuloides, 1: 154-W, 154-E, 154-N; 2: 17
Populus trichocarpa, 1: 153-W, 153-N; 2: 16
Potentilla fruticosa, 2: 50
Prosopis juliflora, 3: 118-N, 118-SW
Prosopis pubescens, 3: 117
Prunus alleghaniensis, 4: 96
Prunus americana, 3: 119-NW, 119-SW; 4: 95-NE, 95-SE; 5: 104
Prunus angustifolia, 3: 120; 4: 97; 5: 105
Prunus caroliniana, 4: 98; 5: 106
Prunus emarginata, 3: 122-N, 122-W
Prunus fremontii, 3: 121
Prunus hortulana, 4: 99
Prunus ilicifolia, 3: 123
Prunus lyonii, 3: 124
Prunus mexicana, 4: 100-N, 100-SE
Prunus munsoniana, 4: 101
Prunus myrtifolia, 5: 233
Prunus nigra, 4: 102
Prunus pennsylvanica, 3: 125-N, 125-NW; 4: 104-N, 104-NE
Prunus serotina, 1: 155-N, 155-W, 155-E; 5: 107
Prunus subcordata, 3: 126
Prunus umbellata, 4: 105; 5: 108
Prunus virginiana, 3: 127-N, 127-NW, 127-SW; 4: 104-N, 104-NE

- Pseudophoenix sargentii*, **5**: 234
Pseudotsuga macrocarpa, **1**: 79-W
Pseudotsuga menziesii, **1**: 80-W, 80-N
Psidium longipes, **5**: 235
Ptelea crenulata, **3**: 129
Ptelea trifoliata, **3**: 128-N, 128-SW; **4**: 106-N, 106-NE, 106-SE; **5**: 109
- Quercus agrifolia*, **1**: 156-W
Quercus ajoensis, **3**: 130
Quercus alba, **1**: 157-E; **5**: 110
Quercus arizonica, **3**: 131
Quercus arkansana, **4**: 107; **5**: 111
Quercus bicolor, **1**: 159-E
Quercus chapmanii, **4**: 108; **5**: 112
Quercus chrysolepis, **1**: 158-W
Quercus coccinea, **1**: 161-E
Quercus douglasii, **1**: 160-W
Quercus dunni, **3**: 132
Quercus durandii, **4**: 109; **5**: 113
Quercus ellipsoidalis, **1**: 163-E
Quercus emoryi, **1**: 162-W
Quercus engelmannii, **3**: 133
Quercus falcata, **1**: 165-E; **5**: 114
Quercus gambelii, **1**: 164-W
Quercus garryana, **1**: 166-W
Quercus georgiana, **4**: 110
Quercus glaucoides, **3**: 134
Quercus graciliformis, **3**: 135
Quercus gravesii, **3**: 136
Quercus grisea, **3**: 137
Quercus havardii, **3**: 138
Quercus hypoleucoides, **3**: 139
Quercus ilicifolia, **4**: 111
Quercus imbricaria, **4**: 112
Quercus incana, **4**: 113; **5**: 115
Quercus kelloggii, **1**: 167-W
Quercus laevis, **4**: 114; **5**: 116
Quercus laurifolia, **1**: 168-E; **5**: 117
Quercus lobata, **1**: 170-W
Quercus lyrata, **1**: 169-E; **5**: 118
Quercus macdonaldii, **3**: 140
Quercus macrocarpa, **1**: 172-W, 172-E
Quercus marilandica, **1**: 171-E; **5**: 119
- Quercus michauxii*, **1**: 174-E; **5**: 120
Quercus mohriana, **3**: 141
Quercus muehlenbergii, **1**: 173-W, 173-E; **5**: 124
Quercus myrtifolia, **4**: 115; **5**: 121
Quercus nigra, **1**: 175-E; **5**: 122
Quercus nuttallii, **1**: 176-E
Quercus oblongifolia, **3**: 142
Quercus oglethorpensis, **4**: 116
Quercus palustris, **1**: 177-E
Quercus phellos, **1**: 178-E; **5**: 123
Quercus prinus, **1**: 179-E
Quercus pungens, **3**: 144
Quercus rubra, **1**: 180-N, 180-E
Quercus rugosa, **3**: 143-N, 143-SW
Quercus shumardii, **1**: 181-W, 181-E; **5**: 125
Quercus stellata, **1**: 182-W, 182-E; **5**: 126
Quercus tardifolia, **3**: 136
Quercus tomentella, **3**: 145
Quercus toumeyii, **3**: 146
Quercus turbinella, **3**: 147
Quercus velutina, **1**: 183-E; **5**: 127
Quercus virginiana, **1**: 184-N, 184-W, 184-E; **5**: 128
Quercus wislizeni, **3**: 148
- Rapanea punctata*, **5**: 236
Reynosia septentrionalis, **5**: 237
Rhamnus betulifolia, **3**: 149
Rhamnus californica, **3**: 151
Rhamnus caroliniana, **4**: 117-N, 117-SE; **5**: 129
Rhamnus crocea, **3**: 150-NW, 150-SW
Rhamnus purshiana, **1**: 185-W, 185-N
Rhizophora mangle, **1**: 186-N, 186-E; **5**: 238
Rhododendron catawbiense, **4**: 118
Rhododendron lapponicum, **2**: 74
Rhododendron macrophyllum, **3**: 152
Rhododendron maximum, **4**: 119
Rhus choriophylla, **3**: 153
Rhus copallina, **4**: 120-N, 120-SE; **5**: 130
- Rhus glabra*, **3**: 155-NW, 155-SW; **4**: 121-NE, 121-SE; **5**: 131
Rhus integrifolia, **3**: 154
Rhus kearneyi, **3**: 156
Rhus lanceolata, 158-N, 158-SW
Rhus laurina, **3**: 157
Rhus microphylla, **3**: 159
Rhus ovata, **3**: 160
Rhus typhina, **4**: 122-N, 122-NE
Ribes bracteosum, **2**: 42
Ribes glandulosum, **2**: 43
Ribes hudsonianum, **2**: 44
Ribes lacustre, **2**: 45
Ribes laxiflorum, **2**: 46
Ribes triste, **2**: 47
Robinia kelseyi, **4**: 123
Robinia neomexicana, **3**: 162
Robinia pseudoacacia, **1**: 187-E
Robinia viscosa, **4**: 124
Rosa acicularis, **2**: 51
Rosa nutkana, **2**: 52
Roystonea elata, **5**: 239
Rubus idaeus var. *strigosus*, **2**: 53
Rubus parviflorus, **2**: 54
Rubus spectabilis, **2**: 55
- Sabal mexicana*, **3**: 161-N, 161-SW
Sabal minor, **4**: 125; **5**: 132
Sabal palmetto, **1**: 188-E; **5**: 133
Salix alaxensis, **2**: 18; **3**: 163-N
Salix amygdaloides, **1**: 189-W, 189-E, 189-N
Salix arbusculoides, **2**: 19; **3**: 164-N
Salix barclayi, **2**: 20
Salix bebbiana, **2**: 21; **3**: 165-N, 165-NW, 165-SW; **4**: 127-N, 127-NE
Salix bonplandiana, **3**: 166-N, 166-SW
Salix caroliniana, **4**: 126; **5**: 134
Salix discolor, **3**: 167-N, 167-W; **4**: 128-N, 128-NE
Salix exigua, **3**: 168-NW, 168-SW, 168-N; **4**: 128-N, 128-NE, 128-SE
Salix floridana, **4**: 130; **5**: 135
Salix fluviatilis, **3**: 169
Salix geyerana, **3**: 170

- Salix glauca*, 2: 22
Salix hindsiana, 3: 171
Salix hookerana, 2: 23; 3: 172-N, 172-W
Salix interior, 2: 24
Salix laevigata, 3: 176
Salix lanata ssp. *richardsonii*, 2: 25
Salix lasiandra, 2: 26; 3: 173-N, 173-W
Salix lasiolepis, 3: 174-NW, 174-SW
Salix lucida, 4: 131-N, 131-NE
Salix mackenzieana, 3: 175-N, 175-W
Salix monticola, 2: 27
Salix nigra, 1: 190-N, 190-W, 190-E; 3: 177-N, 177-NW, 177-SW; 5: 136
Salix novae-angliae, 2: 28
Salix pellita, 4: 132-N, 132-NE
Salix petiolaris, 3: 178-N, 178-NW; 4: 133-N, 133-NE
Salix planifolia ssp. *pulchra*, 2: 29
Salix pyrifolia, 4: 134-N, 134-NE
Salix reticulata, 2: 30
Salix scoulerana, 2: 31; 3: 179-N, 179-W
Salix sericea, 4: 135-N, 135-NE
Salix sessilifolia, 3: 180
Salix sitchensis, 2: 32; 3: 182-N, 182-W
Salix taxifolia, 3: 183-N, 183-SW
Salix tracyi, 3: 181
Sambucus callicarpa, 2: 81; 3: 184-N, 184-W
Sambucus canadensis, 4: 136-NE, 136-SE, 136-N; 5: 137
Sambucus glauca, 3: 185-NW, 185-SW
Sambucus melanocarpa, 3: 187
Sambucus mexicana, 3: 186-N, 186-W
Sambucus velutina, 3: 188
Sapindus drummondii, 3: 189; 4: 138
Sapindus saponaria, 4: 139; 5: 240
Sapium biloculare, 3: 190
Sassafras albidum, 1: 191-E; 5: 138
Savia bahamensis, 5: 241
Schaefferia frutescens, 5: 242
Schoepfia chrysophylloides, 5: 243
Sequoia sempervirens, 1: 81-W
Sequoiadendron giganteum, 1: 82-W
Serenoa repens, 4: 137; 5: 139
Shepherdia argentea, 3: 191-NW, 191-SW; 4: 144
Shepherdia canadensis, 2: 61
Simarouba glauca, 5: 244
Solanum erianthum, 4: 140-N, 140-SE; 5: 245
Sophora affinis, 4: 145
Sophora secundiflora, 3: 192-N, 192-SW
Sorbus americana, 4: 141-N, 141-NE
Sorbus decora, 4: 142-N, 142-NE
Sorbus scopulina, 2: 56; 3: 193-N, 193-W
Sorbus sitchensis, 2: 57; 3: 194-N, 194-W
Spiraea beauverdiana, 2: 58
Staphylea bolanderi, 3: 195
Staphylea trifolia, 4: 143-NE, 143-SE; 5: 140
Stewartia malacodendron, 4: 146; 5: 141
Stewartia ovata, 4: 147
Styrax americana, 4: 148; 5: 142
Styrax grandifolia, 4: 149; 5: 143
Styrax platanifolia, 4: 150
Suriana maritima, 5: 246
Swietenia mahagoni, 1: 192-E; 5: 247
Symplocos tinctoria, 4: 151; 5: 144
Taxodium distichum, 1: 84-E; 5: 11
Taxodium mucronatum, 1: 83-W, 83-N
Taxus brevifolia, 1: 86-W, 86-N; 2: 1
Taxus canadensis, 1: 86.1-N, 86.1-E
Taxus floridana, 1: 85-E; 5: 12
Tetrazygia bicolor, 5: 248
Thrinax morrisii, 5: 249
Thrinax radiata, 5: 250
Thuja occidentalis, 1: 89-N, 89-E
Thuja plicata, 1: 90-W, 90-N; 2: 11
Tilia americana, 1: 193-E
Tilia caroliniana, 4: 153; 5: 145
Tilia heterophylla, 1: 194-E; 5: 146
Torreya californica, 1: 87-W
Torreya taxifolia, 1: 88-E; 5: 13
Toxicodendron vernix, 4: 152-NE, 152-SE; 5: 147
Trema lamarckiana, 5: 251
Trema micrantha, 5: 252
Tsuga canadensis, 1: 91-N, 91-E
Tsuga caroliniana, 1: 94-E
Tsuga heterophylla, 1: 92-W, 92-N; 2: 7
Tsuga mertensiana, 1: 93-W, 93-N; 2: 8
Ulmus alata, 1: 195-E; 5: 148
Ulmus americana, 1: 196-N, 196-W, 196-E; 5: 149
Ulmus crassifolia, 1: 197-E; 5: 150
Ulmus rubra, 1: 198-W, 198-E; 5: 151
Ulmus serotina, 1: 197.1-E
Ulmus thomasi, 1: 200-E
Umbellularia californica, 1: 199-W
Ungnadia speciosa, 3: 196
Vaccinium alaskaense, 2: 75
Vaccinium arboreum, 4: 154; 5: 152
Vaccinium caespitosum, 2: 76
Vaccinium ovalifolium, 2: 77
Vaccinium parvifolium, 2: 78
Vaccinium uliginosum, 2: 79
Vaccinium vitis-idaea, 2: 80
Vauquelinia californica, 3: 197
Vauquelinia pauciflora, 3: 198
Viburnum edule, 2: 82
Viburnum lentago, 3: 199; 4: 155
Viburnum nudum, 4: 156; 5: 153
Viburnum obovatum, 4: 157; 5: 154
Viburnum prunifolium, 4: 158
Viburnum rufidulum, 4: 160
Viburnum trilobum, 3: 200; 4: 159-N, 159-NE
Washingtonia filifera, 3: 201
Ximения americana, 5: 253

Yucca aloifolia, **4**: 161; **5**:
156
Yucca brevifolia, **3**: 202
Yucca carnerosana, **3**: 203
Yucca elata, **3**: 204
Yucca faxoniana, **3**: 205
Yucca gloriosa, **4**: 162; **5**: 157
Yucca mohavensis, **3**: 206
Yucca rostrata, **3**: 207
Yucca schottii, **3**: 208
Yucca torreyi, **3**: 209
Yucca treculeana, **3**: 210

Zanthoxylum americanum,
4: 163
Zanthoxylum clava-herculis,
4: 165; **5**: 158
Zanthoxylum coriaceum, **5**:
254
Zanthoxylum fagara, **4**:
164-N, 164-SE; **5**: 255
Zanthoxylum flavum, **5**: 256
Zanthoxylum hirsutum, **4**:
166

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