



Agenda Item

DATE: January 13, 2009

TO: Board of Supervisors

FROM: Alan Weaver, Director *Alan Weaver*
Department of Public Works and Planning

SUBJECT: Approve revised Oak Woodlands Management Plan and Designate the Sierra Resource Conservation District to Lead Efforts to Manage the Oak Woodlands Conservation Program and Certify Consistency of Projects Funded by Oak Woodlands Conservation Fund with the Oak Woodlands Management Plan.

RECOMMENDED ACTION:

1. Approve revised Fresno County Oak Woodlands Management Plan, and
2. Authorize Chair to sign resolution adopting the Oak Woodlands Management Plan and designating the Sierra Resource Conservation District to manage the Oak Woodlands Conservation Program and Habitat areas funded with State Oak Woodlands Conservation Fund grants, and to Certify Project Applications as Consistent with the Fresno County Oak Woodlands Management Plan.

The State of California has established an Oak Woodlands Conservation Program, to provide grant funding and other incentives for voluntary private conservation of oak woodlands in Counties which have adopted an Oak Woodlands Management Plan. In 1998 the Fresno County Board of Supervisors approved the Oak Woodlands Management Guidelines, which met the State Board of Forestry criteria for such a Plan at that time.

Your Board has received a request from the Sierra Resource Conservation District (SRCD) to revise the Plan and allow the SRCD to manage the Oak Woodlands Conservation Program in Fresno County (Attachment A). The original voluntary Guidelines remain unchanged. The revisions add a listing of oaks native to Fresno County and a map of oak woodland areas in Fresno County, both now required for a complete Oak Woodlands Management Plan.

The Oak Woodlands Management Plan, and participation in the State Oak Woodlands Management Plan program by landowners, remains voluntary. The revised complete Oak Woodlands Management Plan is shown in Attachment B.

ADMINISTRATIVE OFFICE REVIEW *Brandi Orth* Page 1 of 21
 BOARD ACTION: DATE January 13, 2009 APPROVED AS RECOMMENDED OTHER



Official Action of Board of Supervisors

UNANIMOUS ANDERSON _____ CASE _____ LARSON _____ PEREA _____ POOCHIGIAN _____

ALTERNATIVE ACTIONS:

Your Board may decline to amend the Fresno County Oak Woodlands Management Plan. This will result in Fresno County no longer having a current Plan. Local entities would be unable to apply for State Oak Woodlands Conservation funds.

Your Board may decline to designate the Sierra Resource Conservation District as lead entity in Fresno County for the State Oak Woodlands Conservation Program. This would require either Fresno County staff or another local entity to assume these duties in order to access State funds for oak woodlands conservation.

The Public Works and Planning Department does not have sufficient resources to add administration of an Oak Woodlands Conservation program. No other entity has requested this designation from Fresno County.

FISCAL IMPACT:

The recommended action will have no effect on Net County Cost. Use of State Oak Woodlands Conservation Funds to create conservation easements will not affect property taxation and is not expected to affect assessed valuation.

IMPACTS ON JOB CREATION:

This action has no effect on job creation.

DISCUSSION:

In 1998, after an extensive participatory effort led by the Sierra Resource Conservation District, the Board of Supervisors approved the Oak Woodlands Management Guidelines, which met the State Board of Forestry criteria as an Oak Woodlands Management Plan. These Guidelines were subsequently incorporated into the Fresno County General Plan (Policy O.S. – F.11).

Fish and Wildlife Code sections 1360 - 1372 address eligibility for the Oak Woodlands Conservation Fund. The statutes provide grant funding local agencies, districts, non-profits, or individuals authorized under section 815.3 of the California Civil Code to hold a conservation easement. The statute requires that if two or more entities seek grant funding from the State pursuant to the Oak Woodlands Conservation Program, the County shall designate which entity shall lead local efforts to manage the Oak Woodlands habitat.

The Sierra Resource Conservation District has requested that it be designated by your Board as the lead entity to manage the Oak Woodlands Conservation Program in Fresno County. The Kings River Conservancy is currently working with the SRCD to acquire from a willing seller a conservation easement on oak woodland in Fresno County along the Kings River. They wish to apply to the State for an Oak Woodlands Conservation Program grant to fund the easement.

Access to the Oak Woodlands Management Program funds also requires the County to certify project consistency with a valid Oak Woodlands Management Plan. The resolution includes delegation of this action to the SRCD.

The Sierra Resource Conservation District has historically taken the lead in development of Fresno County's Oak Woodland Conservation Plan and has the particular expertise and capacity to assume the lead in Fresno County for applications and administration of this program.

Designation of the Sierra Resource Conservation District does not preclude participation in the State program by other organizations or private parties. Other conservancies or private parties within the County may work with the District to seek conservation funding consistent with the Fresno County and State guidelines. Participation in the Program is voluntary.

OTHER INVOLVED AGENCIES:

The Sierra Resource Conservation District approved a resolution on December 10, 2008 and has requested designation by your Board as the local entity responsible to lead efforts to manage the oak woodlands conservation program in Fresno County, per Fish and Game Code section 1366.

The Kings River Conservancy, the Sierra Foothill Conservancy, and the Fresno-Madera Cattlemen's Association concur with this request.

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BEFORE THE BOARD OF SUPERVISORS
OF THE COUNTY OF FRESNO
STATE OF CALIFORNIA

IN THE MATTER OF APPROVING THE FRESNO)
COUNTY OAK WOODLANDS MANAGEMENT PLAN,)
ALLOWING VOLUNTARY PARTICIPATION IN OAK)
WOODLANDS CONSERVATION PROGRAM, AND)
DESIGNATING THE SIERRA RESOURCE)
CONSERVATION DISTRICT TO LEAD EFFORTS TO)
MANAGE OAK WOODLANDS UNDER THE PROGRAM)
AND CERTIFY CONSISTENCY OF PROPOSALS TO)
THE OAK WOODLANDS MANAGEMENT PLAN)

RESOLUTION

WHEREAS, the State of California has enacted the Oak Woodlands Conservation Act (Stats. 2001, chapter 588), codified at section 1360 et seq. of the Fish and Game Code, which provides funding for the voluntary conservation and protection of California's oak woodlands; and

WHEREAS, ten of the twenty species of oak native to California are found in the County of Fresno; and

WHEREAS, the Board of Supervisors recognizes the value of the County's oak woodland resources for their economic, recreational, wildlife habitat and aesthetic value to the people of the County and to visitors; and

WHEREAS, the economic, social, and environmental viability of the agricultural-forestry enterprises operating within these oak woodlands should be protected; and

WHEREAS, the oak woodlands are vulnerable to forest fires and destructive pests and diseases, such as sudden oak death; and

WHEREAS, integration of protection measures through vegetation management within the oak woodlands is encouraged to protect natural resources, property and life; and

WHEREAS, the Board of Supervisors adopted the Voluntary Water Quality, Grazing Land, and Oak Woodland Conservation Management Guidelines on March 10, 1998, which have aided landowners in the management and stewardship of the County's oak woodlands, and

1 WHEREAS, the Sierra Resource Conservation District has indicated to the Board of
2 Supervisors its willingness to accept the responsibility to monitor and implement the Oak
3 Woodlands Conservation Program consistent with the Oak Woodlands Management Plan
4 adopted by this Resolution, and to insure that individual proposals under the Program are
5 consistent with the Oak Woodlands Management Plan.

6 NOW, THEREFORE BE IT RESOLVED, the Board of Supervisors of the County of
7 Fresno, State of California, resolves as follows:

8 1. The Board of Supervisors adopts the attached Oak Woodlands Management Plan,
9 attached hereto and incorporated by reference.

10 2. The Board of Supervisors supports those landowners who voluntarily participate in
11 the Oak Woodlands Conservation Program provided by the California Wildlife Conservation
12 Board pursuant to section 1366(f) of the Fish and Game Code.

13 3. The Sierra Resource Conservation District shall be responsible for monitoring and
14 implementing the Oak Woodlands Conservation Program in the County of Fresno, and shall
15 ensure and certify that individual proposals are consistent with the Oak Woodlands
16 Management Plan.

17 4. The Oak Woodlands Management Plan is voluntary and shall not have the force
18 of law, whether for regulatory or taxation purposes.

19 5. Conservation easements voluntarily enacted under the Oak Woodlands
20 Conservation Program may contain restrictions or limit uses of property that are, or
21 potentially are, otherwise legally permissible under local or State regulation or ordinance.
22 Any such restrictions or regulations shall be confined to properties under conservation
23 easements only and any such further restriction or limitation shall not apply to adjacent
24 properties.

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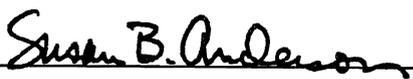
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1 THE FOREGOING was passed and adopted by the following vote of the
2 Board of Supervisors of the County of Fresno this 13th day of January, 2009, to-
3 wit:

4 AYES: Supervisors Larson, Perea, Case, Poochigian, Anderson
5 NOES: None
6 ABSENT: None

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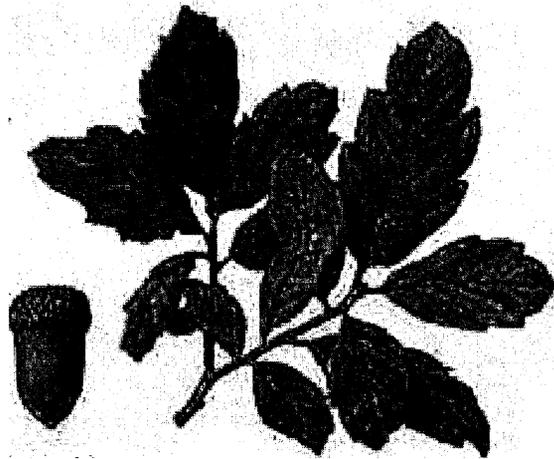

CHAIRMAN, Board of Supervisors

ATTEST:
BERNICE E. SEIDEL
Clerk, Board of Supervisors

By 
Deputy

Agenda Item # 32
Reso. # 09-014

FRESNO COUNTY
OAK WOODLANDS
MANAGEMENT PLAN



January 2009

Prepared and Compiled
Pursuant to the Oak Woodlands Conservation Act
(Ca. Fish and Game Code Section 1360 - 1372)
By the Sierra Resource Conservation District and County of Fresno

FRESNO COUNTY
OAK WOODLANDS MANAGEMENT PLAN

SECTION A:

FRESNO COUNTY 1998 OAK WOODLAND MANAGEMENT GUIDELINES
(Adopted March 10, 1998)

SECTION B:

OAK SPECIES IDENTIFICATION – EXCERPTS FROM THE JEPSON MANUAL –
HIGHER PLANTS OF CALIFORNIA

SECTION C:

FIRE AND RESOURCE PROTECTION (FRAP) MAP, HARDWOOD HABITATS IN
FRESNO COUNTY (CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE
PROTECTION)

SECTION A

**FRESNO COUNTY
1998 OAK WOODLAND MANAGEMENT GUIDELINES**

Fresno County
Oak Woodland Management Guidelines



Adopted March 10,1998

Sponsored by

SIERRA RESOURCE CONSERVATION DISTRICT

843 Euclid Avenue Clovis, CA 93612

and

WESTSIDE RESOURCE CONSERVATION DISTRICT

PO Box 205, Five Points, CA 93624

Fresno County Oak Woodlands Management Guidelines

The following recommendations are being presented to landowners to assist them in determining how they can best manage their oak woodlands. We emphasize that these guidelines are voluntary. The recommendations are not in any particular order of importance. All recommendations should be considered when reviewing a specific piece of property. Landowners are encouraged to create an Oak Management Plan for their property using the Integrated Hardwood Management Program Information and the other listed resources for specific assistance.

1. When Building Within Oak Woodlands:

- Develop an Oak Woodland Management Plan to retain existing oaks, preserve agriculture, retain wildlife corridors, and enhance soil and water conservation practices.
- Avoid tree root compaction during construction by limiting heavy equipment in root zones.
- Carefully plan roads, cuts and fills, building foundations, and septic systems to avoid damage to tree roots. Design roads and consolidate utility services to minimize erosion and sedimentation to downstream sources. Also, consider reseeded any disturbed ground.
- Avoid landscaping which requires irrigation within ten (10) feet of the trunk of an existing oak tree to prevent root rot.
- Consider replacing trees whose removal during construction was avoidable.

2. Take Steps to Increase Fire Safety on Wooded Parcels:

- Recognize fire as a natural feature of the oak woodland landscape and plan accordingly.
- Set up a continuous management program as a part of your Oak Woodland Management Plan to maintain a fire-safe property environment.
- Identify and manage trees to be fire-safe.
- Recognize the impact of steep slopes on fire safety.
- Develop a fire-safe and oak-friendly landscape plan for your home or business.

3. When Implementing Range Improvement Practices in Oak Woodlands:

- When using prescribed fire as a range improvement practice, obtain professional assistance to maximize benefits and minimize risk.
- When converting oak woodlands to other agricultural uses, consider incorporating an oak retention component or a conservation easement in your Oak Woodland Management Plan.

4. When Harvesting Oaks for Fuel or Range Improvement, Plan Your Harvest to:

- Maintain an average canopy cover of 10 to 30 percent depending on site, elevation, and precipitation.
- Retain some oak trees of all sizes and species represented at the site and in clusters where possible.
- When safety permits, leave old hollow trees and those actively being used for nesting, roosting, or feeding.
- Where low fire risk and aesthetics allow, pile limbs and brush to provide wildlife cover.
- Use fire-inhibiting and drought-tolerant and oak-compatible landscaping wherever possible.
- Create "Defensible Space" around buildings. Defensible space is that area which lies between a structure and an oncoming wildfire where the vegetation has been modified to reduce the wildfire threat and which provides an opportunity for firefighters to safely defend a structure.
- Develop water sources--ponds, troughs, seeps, and springs for livestock and wildlife.
- Where commercial or extensive harvest is being contemplated, seek professional advice.

Oak Woodland Resources for the Landowner

Learn about Conservation Districts:

http://www.consrv.ca.gov/DLRP/RCD/about_us/Pages/index.aspx

Sierra Resource Conservation District

36281 Lodge Road, Tollhouse CA 93667 <http://sierrarcd.com>

Westside Resource Conservation District

P.O. Box 205, Five Points, CA 93624 (559) 227-2489

University of California Cooperative Extension Farm Advisor

1720 S. Maple Ave., Fresno CA 93702 (559) 456-7285

<http://cefresno.ucdavis.edu/>

Integrated Hardwood Range Management Program

Neil McDougal, Area IHRMP, (559) 675-7879

Serving Fresno, Madera and Mariposa counties

328 Madera Ave., Madera, CA 93637

<http://danr.ucop.edu/ihrmp/>

Guidelines for Managing California's Hardwood Rangelands; University of California Division of Agriculture & Natural Resources Publication 3368; Published 1996

Ordering information: 1-800-994-8848 email to rippee@nature.berkeley.edu

Oaks 'n Folks – Integrated Hardwood Rangement Management Program Newsletter; Free; <http://danr.ucop.edu/ihrmp/oakfolk.html>

California Department of Forestry and Fire Protection
Sierra South Regional Headquarters, 1234 E. Shaw Avenue Fresno CA 93710-7899 (559) 222-3714 <http://www.fire.ca.gov/>

Forestland Steward Quarterly Newsletter, California Forest Stewardship Coordinating Committee, P.O. Box 944246, Sacramento, CA 94244-2460 (916) 653-8286

Natural Resources Conservation Services, USDA
4625 Jennifer, Suite 125, Fresno, CA 93722 (559) 276-7494
<http://www.nrcs.usda.gov/>

California Department of Fish and Game
1234 E. Shaw Avenue, Fresno, CA 93710-7899 (559) 222-3761
<http://www.dfg.ca.gov/>

ADDITIONAL REFERENCE – Other Oak Woodland Management Publications:

Note Most resource agencies have free literature on oak woodlands

- Oaks of California softcover, 184 pp. California Oak Foundation, 1212 Broadway, St. 810, Oakland, CA 94612 (510)763-0282
- Living among the Oaks; an Oak Management guide for homeowners 8 pp. Free; University of California Cooperative Extension, 328 Madera Ave., Madera, CA 93637 (559) 675-7879

Federal, State, and Fresno County programs are offered on a nondiscriminatory basis, without regard to race, color, national origin, sex, age marital status, or handicap.

Adopted by the Fresno County Board of Supervisors on March 10, 1998 (Resolution # 98-150).

SECTION B

OAK SPECIES IDENTIFICATION – EXCERPTS FROM THE JEPSON
MANUAL – HIGHER PLANTS OF CALIFORNIA

C. chrysophylla (Hook.) Hjelmq. GIANT CHINQUAPIN Shrub or tree < 30(45) m; top ± conic. ST: trunk bark ± thick, rough, furrowed. LF: petiole 5-12 mm; blade 5-15 cm, lanceolate to oblong, base tapered, tip abruptly long-tapered; upper surface dark green; lower surface golden. FR: bur 3-5 cm diam; nut 6-15 mm. Coniferous forest, closed-cone-pine forest, chaparral; < 2000 m. NW, n CaR, n SNH (El Dorado Co.), CW (exc SCoRI); to WA. ☼DRN:4-6,15-17&IRR:1-3,7,14,18;DFCLT.

var. *chrysophylla* (p. 659) Tree < 30(45) m. LF: blade gen flat. Coniferous forest; < 2000 m. Range of sp. (exc SCoRO). [*Castanopsis* c. (Hook.) A. DC. var. c.]

var. *minor* (Benth.) Munz (p. 659) Shrub or small tree < 5(10) m. LF: blade ± folded, margins turned upward lengthwise. Hab-

tats of sp.; < 1800 m. NW, CW (exc SCoRI). [*Castanopsis* s. (Hook.) A. DC. var. m. (Benth.) A. DC.]

C. sempervirens (Kellogg) Hjelmq. (p. 659) BUSH CHINQUAPIN Shrub < 3(10) m; top rounded. ST: trunk bark gen thin, ± smooth gen not furrowed. LF: petiole 4-15 mm; blade 2-3(12) cm, ± elliptic, base tapered to rounded, tip obtuse to rounded; upper surface dull green; lower surface golden to rusty. FR: bur 2-3.5 cm diam; nut 8-13 mm. Rocky slopes, coniferous forest, chaparral; 700-3300 m. KR, NCoRH, CaRH, SNH, SnGb, SnBr, SnJt, w MP, OR. [*Castanopsis* s. (Kellogg) Dudley] ☼DRN,SUN:4-6&IRR:1-3,7,14-17;DFCLT.

LITHOCARPUS TAN OAK, TANBARK OAK

Evergreen. LF: stipules early deciduous. STAMINATE INFL: spike, elongate, simple, stiff, spreading or erect; fls many. PISTILLATE INFL below staminate infl on same or separate stalk; fl 1. STAMINATE FL: sepals 5-6, minute; stamens 10-12. PISTILLATE FL: calyx 6-lobed. FR: acorn, maturing in 2 years; nut enclosed by cup-like involucre. ± 100 spp.: w N.Am (1 sp.), esp se Asia. (Greek: rock fr, from hard fr wall)

L. densiflorus (Hook. & Arn.) Rehder TAN OAK, TANBARK OAK Shrub or tree < 30(45) m; trunk bark grayish brown. LVS evergreen; petioles 10-25 mm; blade 3-14 cm, oblong to ± ovate, base ± rounded, tip obtuse, margin entire to serrate, upper surface sparsely stellate-hairy, becoming ± glabrous, lower surface finely woolly, becoming ± glabrous. STAMINATE INFL stiff, spreading to erect, densely fld. FR: cup (1.5)2-3 cm diam, saucer-shaped, scales slender, ± tapered, reflexed to spreading; nut 20-35 mm, ovoid to sub-spheric. Redwood to red-fir forests; < 2000 m. NW, CaR, SN, CW, WTR; s OR.

1' Shrub < 3 m; lf margin entire to few-toothed, lower surface with main veins obscure var. *echinoides*

var. *densiflorus* (p. 663) Tree < 30(45) m. LF 4-14 cm, 12-40 mm wide; margin gen serrate; lower surface with main veins prominent, ending in teeth. Habitats of sp.; < 1500 m. NW, CaR, SN, CW, WTR; s OR. ☼DRN:4,5,6,17&IRR:part SHD:1-3,7,14,15,16,18-24;CV.

var. *echinoides* (R.Br. Campst.) Abrams (p. 663) Shrub 1-3 m. LF 3-5(8) cm, 10-30 mm wide; margin entire, slightly wavy, or few-toothed; lower surface with main veins obscure. Mixed-conifer and red-fir forests; 600-2000 m. KR, CaR, SN; s OR. ☼DRN:4-6,17&IRR:1-3,7,14-16,18-21.

1. Tree < 30(45) m; lf margin gen serrate, lower surface with main veins prominent, ending in teeth var. *densiflorus*

QUERCUS OAK

Evergreen or deciduous. LF: stipules small, gen early deciduous. STAMINATE INFLS: catkins, 1-several, slender, on proximal part of twig. PISTILLATE INFL axillary among upper lvs, short-stalked; fl gen 1. STAMINATE FL: calyx 4-6-lobed, minute; stamens 4-10. PISTILLATE FL: calyx minute, gen 6-lobed; ovary enclosed by involucre. FR: acorn, maturing in 1-2 years; nut enclosed by cup-like involucre with thin or tubercled scales. 2n=24 for all reports. ± 600 spp.: n hemisphere, to n S.Am, India. (Latin: ancient name for oak) Many more hybrids have been named but are not incl here. Reproduction of many spp. declining.

- 1. Cup scales thin, flat; bark dark gray or black; acorn shell woolly inside
- 2. Lf moderately to deeply lobed, sinuses between lobes 1/2+ width to midrib, lobes 1-4-toothed, teeth gen bristle-tipped; pls deciduous *Q. kelloggii*
- 2' Lf entire to toothed, teeth abruptly pointed to spine-tipped, not bristle-tipped; pls evergreen
- 3. Lf upper surface convex, margin sometimes inrolled, obscuring marginal teeth, lower vein axils often hair-tufted, blade gen widely elliptic to round; fr maturing in 1 year (on current twig) *Q. agrifolia*
- 4. Lf lower surface glabrous to sparsely hairy (exc vein axils) var. *agrifolia*
- 4' Lf lower surface densely tomentose var. *oxyadenia*
- 3' Lf ± flat, margin not inrolled, lower surface glabrous, blade gen lanceolate to oblong; fr maturing in 2 years (on previous year's growth)
- 5. Lvs 3-9 cm; lf lower surface gen ± dull, olive-green; nut oblong below middle, abruptly tapered to tip *Q. parvula*
- 6. Shrub 1-3 m; n ChI, n SCo var. *parvula*
- 6' Tree < 17 m; w SnFrB, SCoRO var. *shrevei*
- 5' Lvs 2-5 cm; lf lower surface gen ± shiny, yellow-green; nut gradually tapered from below middle to tip *Q. wislizenii*
- 7. Shrub 2-4(6) m var. *frutescens*
- 7' Tree 10-22 m var. *wislizenii*
- 1' Cup scales gen thick, ± flat to gen clearly tubercled; bark light gray to whitish; acorn shell glabrous to woolly inside
- 8. Acorn shell ± woolly inside; fr maturing in 2 years; pls evergreen
- 9. Lvs mostly 3-8 cm; acorn cup thick; gen tree
- 10. Lf lateral veins not clearly impressed on upper surface, lower surface golden-hairy, becoming glabrous *Q. chrysolepis*

- 10' Lf lateral veins impressed on upper surface, lower surface densely tomentose, becoming sparsely tomentose — ChI *Q. tomentella*
- 9' Lvs mostly 1–3.5 cm; acorn cup thin; shrub (or tree < 7 m)
- 11' Twigs very stiff, rigid; lf margin \pm wavy, clearly spine-toothed; blade elliptic to round-ovate; pls 2–6 m, erect *Q. palmeri*
- 11' Twigs pliable; lf margin gen entire, sometimes irregularly serrate, not spine-tipped; blade oblong to ovate; pls < 1.5 m, prostrate to spreading *Q. vaccinifolia*
- 8' Acorn shell glabrous inside; fr maturing in 1 year; pls evergreen or deciduous
- 12' Lf lobed, sinuses between lobes gen > 1/4 distance from midrib to lobe tip; pls deciduous
- 13' Lf moderately to deeply lobed, some sinuses between lobes gen > 1/2 distance to midrib; upper surface \pm shiny, dark green
- 14' Acorn cup 10–30 mm deep, scales all clearly tubercled; nut 30–50 mm, gen long-conic in outline, gradually tapered to pointed tip (also see 17') *Q. lobata*
- 14' Acorn cup 4–9 mm deep, upper scales \pm flat, lower scales slightly tubercled; nut 20–30 mm, ovoid to subspheric, tip \pm rounded *Q. garryana*
- 15' Shrub 1–5 m; petiole 5–20 mm; lf blade 4–9 cm var. *breweri*
- 15' Tree 8–20 m; petiole 10–25 mm; lf blade 7–14 cm var. *garryana*
- 13' Lf weakly lobed, sinuses between lobes gen < 1/2 distance to midrib; upper surface gen dull, green to bluish green
- 16' Upper lf surface green; acorn cup scales clearly tubercled; ChI *Q. \times macdonaldii*
- 16' Upper lf surface bluish or grayish green; acorn cup scales slightly tubercled; mainland
- 17' Small tree (sometimes shrubby), semi-evergreen; lvs 1.5–5 cm, gen irregularly and coarsely toothed, upper surface bluish or grayish green *Q. \times alvordiana*
- 17' Tree, deciduous; lvs gen 3–6 cm, slightly lobed or subentire, upper surface bluish green *Q. douglasii*
- 12' Lf entire to toothed, not lobed; pls evergreen
- 18' Lvs gen 7–11 cm, clearly serrate (teeth 20–32), lateral veins 20–28, prominent; stipules persistent, > 10 mm, silky-hairy *Q. sadleriana*
- 18' Lvs 1–6 cm, entire to dentate, lateral veins gen < 20, not prominent; stipules early deciduous, < 10 mm, not silky-hairy
- 19' Trees gen > 5 m; lvs 2–6 cm, oblong to obovate, entire or slightly toothed, upper surface often bluish green
- 20' Tree < 6(10) m; lvs gen irregularly toothed to subentire, upper surface green to bluish green, \pm glossy to dull *Q. \times acutidens*
- 20' Tree 5–18 m; lvs gen entire or wavy-dentate, upper surface blue-green, dull *Q. engelmannii*
- 19' Shrub gen < 5 m; lvs 1–5 cm, elliptic to ovate or roundish, variously toothed, upper surface gen green
- 21' Lf 2-colored, upper surface yellow- or gray-green, lower surface whitish, densely finely tomentose, hairs obscuring lateral veins *Q. cornelius-mulleri*
- 21' Lf 1–2-colored, upper surface green to gray- or bluish green, lower surface gen green, not densely tomentose, hairs not obscuring lateral veins
- 22' Lf gen oblong to obovate, margin wavy to obtusely toothed — PR *Q. \times acutidens*
- 22' Lf elliptic to ovate or roundish, margin clearly toothed, teeth abruptly pointed to spine-tipped
- 23' Acorn cup thin, scales \pm flat to slightly tubercled; upper lf surface gray- or bluish green, dull
- 24' Acorn stalked (stalk < 15 mm), nut cylindrical-ovoid to elliptic in outline, abruptly tapered at tip, 12–23 mm, gen yellow-brown; lvs oblong to elliptic, regularly spine-toothed — e DMtns *Q. turbinella*
- 24' Acorn sessile, nut conic-ovoid, gradually tapered to tip, 20–40 mm, gen dark brown; lvs oblong to elliptic or obovate, irregularly toothed, teeth blunt to weakly spiny
- 25' Shrub or small tree; lvs 1.5–5 cm, marginal teeth not spiny, upper surface bluish to grayish green *Q. \times alvordiana*
- 25' Shrub; lvs 1.3–2.8 cm, irregularly spine-toothed, upper surface grayish green *Q. john-tuckeri*
- 23' Acorn cup thick, scales tubercled; upper lf surface gen green, \pm shiny (sometimes dull in *Q. durata*)
- 26' Upper lf surface convex, margin often inrolled, obscuring teeth, dull *Q. durata*
- 27' Upper lf surface strongly convex; lower lf surface short-hairy; gen serpentine soils, NCoR, n SNF, SCoR var. *durata*
- 27' Upper lf surface slightly convex; lower lf surface densely short-hairy when young; nonserpentine soils, s SnGb var. *gabrielensis*
- 26' Upper lf surface flat to \pm wavy, not convex, margin gen not inrolled, \pm shiny
- 28' Fr 10–30 mm; acorn cup thick, 12–20 mm wide, scales strongly tubercled; nut ovoid; chaparral, 300–1500 m *Q. berberidifolia*
- 28' Fr < 20 mm; acorn cup thin, 8–15 mm wide, scales slightly to moderately tubercled; nut conic-ovoid; chaparral or coastal-sage scrub, < 200 m *Q. dumosa*

Q. \times acutidens Torrey (p. 663) Shrub or small tree < 6(10) m, evergreen. LF 2–6 cm; petiole 3–7 mm; blade gen oblong to obovate, \pm leathery, tip obtuse to short-toothed, margin wavy to irregularly toothed, teeth \pm obtuse, upper surface shiny and green to dull and bluish green, lower surface \pm densely puberulent, becoming glabrous, dull, pale green. FR: maturing in 1 year; cup 10–18 mm wide, 6–9 mm deep, bowl-shaped, scales \pm tubercled; nut 20–25 mm, oblong to ovoid, tip \pm obtuse, shell glabrous inside. Slopes, chaparral, woodland; < 1600 m. PR. Hybrids, involving *Q. cornelius-mulleri* and *Q. engelmannii*, considered by Torrey as sp.

Q. agrifolia Nee COAST LIVE OAK, ENCINA Tree (6)10–25 m, evergreen; top wide; trunk bark becoming furrowed, widely ridged, checkered, dark gray. LF 2.5–6(9) cm; petiole 4–15 mm; blade oblong, elliptic, or \pm round, tip rounded to spine-toothed, margin weakly spine-toothed, upper surface strongly convex, \pm dull green, lower surface glabrous to densely tomentose, dull, pale green. FR maturing in 1 year; cup 10–16 mm wide, 8–15 mm deep, obconic, scales thin, \pm flat, \pm glabrous, brownish; nut 25–35 mm, slender, ovoid, tip pointed, shell woolly inside. Valleys, slopes, mixed-evergreen forest, woodland; < 1500 m. NCoRO, CW, SW; Baja CA.

var. *agrifolia* (p. 663) LF: lower surface glabrous to sparsely hairy, esp at vein axils. Habitats of sp.; <900 m. NCoRo, CW, SW; Baja CA. Hybridizes with *Q. kelloggii*, *Q. parvula* var. *shrevei*, *Q. wislizeni*. *DRN,SUN:5,7,14-17,22-24&IRR:8,9,10-13,18-21.

var. *oxyadenia* (Torrey) J. Howell (p. 663) LF: lower surface densely tomentose. Gen granitic soils; 600-1500 m. PR; Baja CA. Hybridizes with *Q. kelloggii*. *DRN,SUN:4-6,7,14-17,18-24&IRR:1-3,8,9,10-13.

Q. xalvordiana Eastw. (p. 663) Shrub or tree <3 m, some pls evergreen. LF 1.5-5 cm; petiole 2-5 mm; blade gen oblong to widely elliptic, tip obtuse to abruptly pointed, margin irregularly and coarsely toothed, upper surface dull, bluish to grayish green, lower surface finely hairy, dull, pale green. FR maturing in 1 year; cup 10-16 mm wide, 8-10 mm deep, cup- to bowl-shaped, scales slightly tubercled, light brown; nut 20-40 mm, gen narrowly ovoid, tapered to pointed tip, shell glabrous inside. Dry slopes, hills; 400-1300 m. Teh, SCoRI. Hybrids, involving *Q. douglasii* and *Q. john-tuckeri*, considered by Eastwood as sp.

Q. berberidifolia Liebm. (p. 663) SCRUB OAK Shrub 1-3 m, sometimes tree-like and taller, evergreen. LF 1.5-3 cm; petiole 2-4 mm; blade oblong, elliptic, or ± round, tip gen rounded; margin ± spiny to toothed, teeth abruptly pointed, upper surface ± flat to wavy, ± shiny, green, lower surface appressed-puberulent, dull, pale green. FR maturing in 1 year; cup 12-20 mm wide, 5-10 mm deep, hemispheric to bowl-shaped, thick, scales clearly tubercled; nut 10-30 mm, ovoid, tip obtuse to acute; shell glabrous inside. Dry slopes, chaparral; 300-1500 m. NCoR, SNF, Teh, CW, SW; Baja CA. [*Q. dumosa* Nutt. misapplied] Hybridizes with *Q. durata*, *Q. engelmannii*, *Q. garryana*, *Q. john-tuckeri*, *Q. lobata*. *DRN, SUN:5,7,8-10,14-16,17,18-24,STBL.

Q. chrysolepis Liebm. (p. 663) MAUL OAK, CANYON LIVE OAK Tree <20 m, sometimes shrub-like, evergreen; trunk bark becoming narrowly furrowed, scaly, pale gray; twigs golden-tomentose, becoming ± glabrous. LF (1.5)3-6 cm, leathery; petiole 3-10 mm; blade oblong to oblong-ovate, sometimes round-ovate, tip acute to abruptly pointed, margin entire or spine-toothed, upper surface dark green, lower surface golden-puberulent, becoming glabrous, dull, grayish. FR maturing in 2 years; cup 17-30 mm wide, 5-10 mm deep, saucer- to bowl-shaped, scales thick, flat to slightly tubercled, golden-tomentose; nut 25-30 mm, 14-20 mm wide, ± ovoid, tip rounded to pointed, shell woolly inside. Canyons, shaded slopes, chaparral, mixed-evergreen forest, woodland; 200-2600 m. CA-FP (exc GV), e DMts; OR, AZ, Baja CA. Highly variable. Hybridizes with *Q. palmeri*, *Q. tomentella*, *Q. vaccinifolia*. Shrubs with lvs 2-4 cm have been called var. *nana* (Jepson) Jepson. *DRN,SUN:4-7,14-18,22,23,24&IRR:1-3,8,9,10,11,19-21.

Q. cornelius-mulleri K. Nixon & K. Steele (p. 663) MULLER'S OAK Shrub 1-2.5 m, evergreen, densely branched; twigs finely tomentose. LF 2.5-3.5 cm, leathery; petiole 2-5 mm; blade oblong, ovate, or narrowly obovate, tip acute to rounded, margin entire or 4-6-toothed, upper surface sparsely puberulent, dull, yellow- to gray-green, lower surface densely and finely tomentose, whitish, midrib yellow. FR maturing in 1 year; cup 12-20 mm wide, 5-8 mm deep, hemispheric to cup-shaped, scales ± flat, gray-canescens; nut 20-30 mm, elliptic in outline to widely conic, tip obtuse, puberulent, shell glabrous inside. Slopes, gen granitic soils, chaparral, pinyon woodland; 1000-1800 m. SnBr (n slope), PR (e slope), s DMts (Little San Bernardino Mts); Baja CA. Hybridizes with *Q. engelmannii*, *Q. lobata*. *DRN,SUN:7,9,14,15,16,18-21,22,23&IRR:2,3,8,10,11,STBL.

Q. douglasii Hook. & Arn. (p. 663) BLUE OAK Tree 6-20 m, deciduous; trunk bark checkered into thin scales, grayish. LF 3-6 (8) cm; petiole 3-9 mm; blade oblong to obovate, tip gen rounded, margin ± entire, wavy, or slightly lobed, upper surface dull, bluish green, lower surface puberulent, pale bluish green. FR maturing in 1 year; cup 12-20 mm wide, 6-10 mm deep, cup- to bowl-shaped, scales slightly tubercled; nut 20-35 mm, ovoid, tip pointed, shell glabrous inside. Dry slopes, interior foothills, woodland; <1200 m. NCoRI, CaRF, SNF, Teh, n SnV, SnFrB, SCoRI, WTR (n slope). Hybridizes with *Q. garryana*, *Q. john-tuckeri*, *Q. lobata*. *DRN,SUN:1-3,7,8,9,11,14-16,18-21,22-24&DRY:4-6,10,17.

Q. dumosa Nutt. (p. 663) NUTTALL'S SCRUB OAK Shrub 1-3 m, evergreen; twigs slender (1-1.5 mm diam), sparsely short-hairy, becoming glabrous, dark reddish brown. LF 1-2.5 cm; petiole <5 mm; blade oblong, elliptic, or ± round, tip obtuse to abruptly pointed, margin ± spiny to toothed, teeth abruptly pointed, upper surface slightly shiny, green, lower surface finely tomentose, becoming glabrous, dull, pale green. FR maturing in 1 year; cup 8-15 mm wide, 5-8 mm deep, gen bowl-shaped, scales ± tubercled; nut 10-20 mm, ± slender, gen ovoid, tapered to tip, shell glabrous inside. RARE: Gen sandy soils near coast, sandstone, chaparral, coastal-sage scrub; <200 m. SCo; Baja CA. Hybridizes with *Q. berberidifolia*. In cult.

Q. durata Jepson LEATHER OAK Shrub 1-3 m, evergreen; twigs tomentose, sometimes becoming glabrous. LF 1.5-3 cm; petiole <5 mm; blade oblong to elliptic, convex above, tip spiny or abruptly pointed, margin rolled under, toothed, teeth spiny or abruptly pointed, upper surface puberulent, dull green, lower surface short-hairy, pale green. FR maturing in 1 year; cup 12-18 mm wide, 4-6 mm deep, bowl-shaped, scales tubercled; nut 15-25 mm, ovoid to cylindrical, tip obtuse or rounded, shell glabrous inside. Chaparral; 150-1500 m. NCoR, n SNF, SCoR, SnGb. Hybridizes with *Q. berberidifolia*, *Q. garryana*.

var. *durata* (p. 663) LF: upper surface strongly convex; lower surface short-hairy. Gen serpentine soils; 150-1500 m. NCoR, n SNF, SnFrB, SCoR. *DRN,SUN:5,7,8-10,14-16,17,18-24.

var. *gabrielensis* K. Nixon & C.H. Muller LF: upper surface slightly convex; lower surface densely short-hairy. Granitic soils; 450-1000 m. SnGb (s slope). *TRY.

Q. engelmannii E. Greene (p. 663) ENGELMANN or MESA OAK Tree 5-18 m, evergreen; trunk bark becoming narrowly furrowed; scaly, grayish; young twigs finely tomentose, becoming glabrous. LF 2-6 cm; petiole 3-7 mm; blade oblong to obovate, tip obtuse to rounded, margin gen entire or wavy, sometimes toothed, upper surface dull, bluish green, lower surface soft-hairy when young, becoming glabrous, pale blue-green. FR maturing in 1 year; cup 10-15 mm wide, 6-8 mm deep, cup- to bowl-shaped, scales ± tubercled; nut 15-25 mm, oblong-cylindric to ovoid, tip rounded to obtuse, shell glabrous inside. UNCOMMON. Slopes, foothills, woodland; <1300 m. SCo, s ChI (1 tree on Santa Catalina Island), SnGb, PR; Baja CA. Hybridizes with *Q. berberidifolia*, *Q. cornelius-mulleri*. *DRN,SUN:3,5,7,14-16,17,18-21,22-24&IRR:8,9.

Q. garryana Hook. OREGON OAK Tree 8-20 m or shrub 1-5 m, deciduous; trunk bark thin, becoming widely ridged, scaly, grayish; twigs short-hairy, becoming glabrous, reddish brown. LF 5-15 cm; petiole 5-25 mm; blade elliptic to obovate, tip obtuse to rounded, margin deeply 5-7-lobed, lobes entire or 2-toothed, upper surface shiny, dark green, lower surface short-hairy, dull, light green. FR maturing in 1 year; cup 12-25 mm wide, 4-9 mm deep; cup- to bowl-shaped, scales ± flat to slightly tubercled; nut 20-30 mm, ± ovoid to subspheric, tip rounded, shell glabrous inside. Slopes, woodland, mixed-evergreen or conifer forest; 300-1800 m. NW, CaR, SNF, Teh, SnFrB, ne WTR (Liebre Mtn); to B.C.

var. *breweri* (Engelm.) Jepson (p. 663) Shrub 1-5 m, spreading. ST: terminal buds 3-5 mm. LF: petiole 5-20 mm; blade 4-9 cm. Slopes, mixed-evergreen or conifer forest; 600-1800 m. KR, NCoRH, SNF, Teh, ne WTR (Liebre Mtn); to OR. [var. *semota* Jepson] Hybridizes with *Q. sadleriana*. *DRN:4,5,6,14-16,17&IRR or part SHD:1-3,7,8-11,18,19-23.

var. *garryana* (p. 663) Tree 8-20 m. ST: terminal buds 5-12 mm, fusiform, densely hairy. LF: petiole 10-25 mm; blade 7-14 cm. Slopes, woodland; 300-1800 m. NW, CaRF, SnFrB; to B.C. Hybridizes with *Q. berberidifolia*, *Q. douglasii*, *Q. durata*, *Q. lobata*. *DRN,SUN:4-6,15-17&IRR or part SHD:1-3,7,8,9,14,18,19-23.

Q. john-tuckeri K. Nixon & C.H. Muller (p. 665) TUCKER'S OAK Shrub 2-5 m (sometimes tree-like, <7 m), evergreen; young twigs finely tomentose. LF 1.3-2.8 cm; petiole 1-4 mm; blade oblong, elliptic, or obovate, base rounded to widely wedge-shaped, tip obtuse to rounded, margin irregularly spine-toothed, upper surface dull, gray-green, lower surface finely hairy, pale gray-green.

FR maturing in 1 year; cup 10–15 mm wide, 5–7 mm deep, thin, obconic to hemispheric, scales flat to slightly tubercled; nut 20–30 mm, ovoid to conic, tapered to tip, shell glabrous inside. Slopes on desert borders, chaparral, pinyon/juniper woodland; 900–2000 m. Teh (e slope), SCoRI, WTR (n slope), SnGb (n slope). [*Q. turbinella* E. Greene ssp. *californica* J. Tucker] Hybridizes with *Q. berberidifolia*, *Q. douglasii*, *Q. lobata*. ☉DRN,SUN:7,8,9,11,14–16,17,18–23,24.

Q. kelloggii Newb. (p. 665) CALIFORNIA BLACK OAK Tree < 25 m, deciduous; trunk bark becoming deeply furrowed, checkered, dark gray-brown to black. LF (6)9–20 cm; petiole (3)10–40 mm; blade widely elliptic, obovate, or ± round, tip gen acute, bristled, margin gen deeply 6-lobed, each lobe with 1–4 coarse, bristle-tipped teeth, upper surface glabrous, bright green, lower surface finely tomentose when young, becoming ± glabrous, pale green. FR maturing in 2 years; cup 16–25 mm wide, 15–25 mm deep, gen cup-shaped, scales thin, flat, glabrous to puberulent; nut 20–35 mm, oblong-ovoid, puberulent, tip gen obtuse, shell woolly inside. Slopes, valleys, woodland, coniferous forest; 200–2400 m. CA-FP (exc GV, SCo, ChI); OR, Baja CA. Hybridizes with *Q. agrifolia*, *Q. wislizeni*. ☉DRN:1,4,5,6,15,16,17&IRR or part SHD:2,3,7,8,9,14,18,19–21.

Q. lobata Nee (p. 665) VALLEY OAK, ROBLE Tree < 35 m, deciduous; trunk bark becoming deeply checkered into squarish sections, light grayish. LF 5–12 cm; petiole 5–12 mm; blade obovate, tip obtuse to rounded, margin deeply 6–10-lobed, lobes obtuse, gen coarsely 2–3-toothed at tip, upper surface often ± shiny, dark green, lower surface finely tomentose, dull to pale green. FR maturing in 1 year; cup 14–30 mm wide, 10–30 mm deep, hemispheric, scales clearly tubercled; nut 30–50 mm, 12–20 mm wide, gen long-conic, tapered to pointed tip, shell glabrous inside. UNCOMMON. Slopes, valleys, savannah; < 1700 m. NCoR, CaRF, SNF, Teh, GV, SnFrB, SCoR, nw SCo, ChI (Santa Cruz, Santa Catalina islands), WTR, w SnGb. Hybridizes with *Q. berberidifolia*, *Q. cornelius-mulleri*, *Q. douglasii*, *Q. engelmannii*, *Q. garryana*, *Q. john-tuckeri*. ☉SUN:4–6,14–16,17&IRR,DRN:1–3,7–9,18–21,22–24.

Q. xmacdonaldii E. Greene (p. 665) MACDONALD OAK Tree 5–15 m, deciduous; trunk bark scaly, grayish; twigs tomentose. LF 4–7 cm; petiole 3–10 mm; blade oblong to obovate, tip obtuse to rounded, margin 2–6(8)-lobed, lobes pointed, upper surface glabrous to sparsely hairy, green, ± shiny, lower surface densely appressed-stellate-hairy, ± pale green. FR maturing in 1 year; cup 10–20 mm wide, 6–10 mm deep, hemispheric, scales clearly tubercled, canescent; nut 20–35 mm, conic-oblong to ovoid, tip acute, shell glabrous inside. Slopes, canyons, woodland; < 600 m. ChI (exc San Clemente Island). Considered by Greene as sp. but derived from hybrids between *Q. berberidifolia* and *Q. lobata*; perhaps other spp. involved; needs further study. ☉DRN,SUN:5,7,8–10,14–16,17,18–24.

Q. palmeri Engelm. (p. 665) PALMER'S OAK Shrub 2–6 m, evergreen; twigs spreading, rigid. LF 1–3 cm, very stiff, petiole 2–5 mm; blade elliptic to round-ovate, tip gen spiny, margin wavy and spine-toothed, upper surface glabrous to sparsely puberulent, ± shiny, olive-green, lower surface densely glandular-puberulent when young, pale gray-green. FR maturing in 2 years; cup 10–25 mm wide, 6–12 mm deep, gen bowl-shaped; rim ± spreading, scales flat; densely hairy; nut 20–30 mm, ± ovoid, tip gen obtuse; shell densely woolly inside. Uncommon. Rocky slopes, flats; 700–1300 m. e NCoRI (Colusa Co.), nw SnJV (Alameda, Contra Costa cos.), SCoR (San Luis Obispo, Santa Barbara cos.); SnGb (n slope), e PR, DMtns (Little San Bernardino Mtns); AZ, Baja CA. [*Q. dunnii* Kellogg] Hybridizes with *Q. chrysolepis*. ☉DRN,SUN:7,8,9,10,14–16,17,18–23,24&IRR:11;STBL.

Q. parvula E. Greene Shrub 1–3 m or tree < 17 m, evergreen. LF 3–9 cm; petiole 2–10 mm; blade oblong, lanceolate, or ovate, tip acute to acuminate, margin gen entire, sometimes toothed, upper surface glabrous, olive-green, lower surface glabrous, dull, light olive-green. FR maturing in 2 years; cup 12–15 mm wide, 6–10 mm deep, gen bowl-shaped, scales flat, ± thin; nut 30–45 mm, barrel-shaped to ovoid, tip abruptly tapered, puberulent, shell woolly inside. Canyons, slopes, chaparral, woodland; < 1000 m. SnFrB, SCoRO, n SCo, n ChI (Santa Cruz Island).

var. *parvula* (p. 665) SANTA CRUZ ISLAND OAK Shrub 1–3 m. UNCOMMON. Habitats of sp.; < 500 m. n SCo (Santa Barbara

Co.), n ChI (Santa Cruz Island). ☉DRN,SUN:5,7,14–17,22–24&IRR or part SHD:8,9,19–21.

var. *shrevei* (C.H. Muller) K. Nixon (p. 665) Tree < 17 m. Rather moist woodland; < 1000 m. w SnFrB, SCoRO. Hybridizes with *Q. agrifolia*, *Q. kelloggii*. ☉DRN:5,15–17&IRR:7,8,9,14,18,19–24.

Q. sadleriana R.Br. Campst. (p. 665) DEER OAK Shrub 1–3 m, evergreen; twigs glabrous. LF 7–11(18) cm; petiole 10–20 mm; blade elliptic to oblong-obovate, tip ± acute, margin serrate, teeth 20–32, upper surface green, somewhat shiny, lower surface sparsely, finely appressed-hairy, pale green, lateral veins 20–28, prominent. FR maturing in 1 year; cup 10–18 mm wide, 7–9 mm deep, thin, cup-shaped to obconic, scales flat to slightly tubercled; nut 15–20 mm, elliptic in outline to ± spheric; tip rounded, shell glabrous inside. Open, rocky slopes, ridges, coniferous forest; 600–2200 m. KR; sw OR. Hybridizes with *Q. garryana* var. *breweri*. ☉DRN:4–6&IRR:1,17&SHD:2,3,7,9,14–16,18–21;DFCLT.

Q. tomentella Engelm. (p. 665) ISLAND OAK Tree < 20 m, evergreen; trunk bark becoming furrowed, scaly, gray, sometimes reddish brown; young twigs tomentose. LF 5–8 cm; petiole 5–18 mm; blade oblong to oblong-ovate, tip acute to obtuse or abruptly pointed, margin toothed, teeth abruptly pointed; upper surface ± finely tomentose, becoming glabrous, dark green, lower surface densely tomentose, becoming sparsely woolly, dull, grayish green. FR maturing in 2 years; cup 20–30 mm wide, 6–8 mm deep, saucer- to bowl-shaped, scales thick, tubercled; nut 20–35 mm, widely ovoid, tip rounded, shell ± woolly inside. UNCOMMON. Canyons, slopes, woodland; < 600 m. ChI; Baja CA (Guadalupe Island). Hybridizes with *Q. chrysolepis*. ☉DRN:5,15–17&IRR:7,14,22–24&SHD:8,9,19–21.

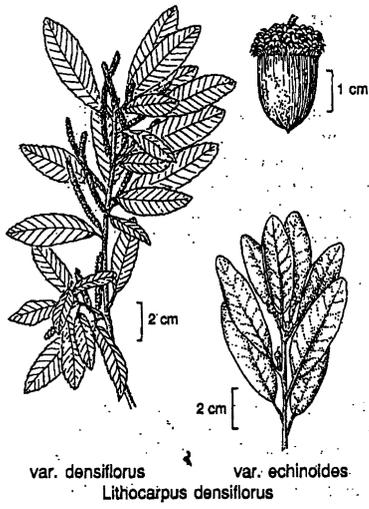
Q. turbinella E. Greene (p. 665) SHRUB LIVE OAK Shrub 2–5 m (sometimes tree-like, < 7 m) evergreen; twigs densely and finely tomentose. LF 1.5–3 cm; petiole 1–3 mm; blade oblong to elliptic, base rounded to subcordate, tip acute to obtuse, sometimes spiny, margin spine-toothed, upper surface dull, gray-green, lower surface with both appressed-stellate and glandular, yellowish hairs. FR maturing in 1 year; stalk < 15 mm; cup 9–12 mm wide, 4–6 mm deep, ± hemispheric, scales flat to slightly tubercled, thin; nut 12–23 mm, cylindrical-ovoid to elliptic in outline, tapered abruptly to tip, yellow-brown, shell glabrous inside. Pinyon/juniper woodland; 1200–2000 m. e DMtns (New York Mtns); to Colorado, TX, Baja CA. ☉DRN:7,8,9,10,11,14,18–21&SUN:5,15–17,22–24;STBL.

Q. vacciniifolia Kellogg (p. 665) HUCKLEBERRY OAK Shrub < 1.5 m, prostrate to spreading, evergreen; twigs slender, pliable, glabrous. LF 1.5–4 cm; petiole 3–6 mm; blade ± oblong, tip obtuse to acute, margin mostly entire, sometimes low-serrate, upper surface glabrous, green, lower surface glabrous, dull, pale green. FR maturing in 2 years; cup 10–12 mm wide, 4–6 mm deep, thin, gen cup-shaped, scales flat to slightly tubercled; nut 10–15 mm, ovoid to subspheric, tip rounded; shell thin, subglabrous to sparsely tomentose inside. Steep slopes, ridges, coniferous forest, subalpine; 900–2800 m. KR, NCoRH, SNH; OR. Hybridizes with *Q. chrysolepis*. ☉DRN,SUN:1,4–6&IRR:2,3,7,14,15,16,17,18.

Q. wislizeni A.DC. INTERIOR LIVE OAK Tree gen 10–22 m (or shrub, 2–6 m) evergreen; trunk bark becoming furrowed, ± checkered, grayish. LF 2–5 cm; petiole 3–15 mm; blade gen oblong to elliptic or lanceolate, tip gen acute, abruptly pointed, margin entire to spine-toothed, upper surface glabrous, shiny, gen dark green, lower surface glabrous, shiny, light or yellow-green. FR maturing in 2 years; cup 12–18 mm wide, 12–16 mm deep, cup-shaped to hemispheric, scales flat, ± thin; nut 20–40 mm, cylindrical-ovoid, ovoid, or ± obconic, tapered to tip, shell woolly inside. Interior canyons, slopes, valleys, chaparral, pine/oak woodland; < 2000 m. NCoR, CaRF, SNF, Teh, SCoR, SW (exc ChI); Baja CA.

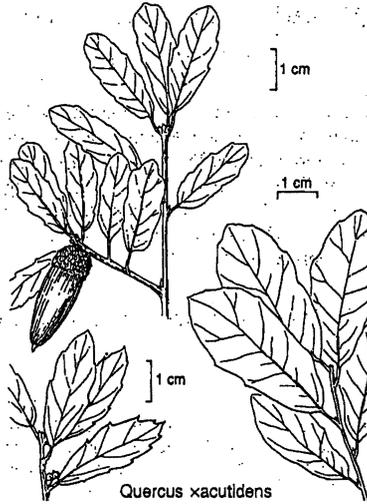
var. *frutescens* Engelm. (p. 665) Shrub 2–6 m. LF: blade 1.8–4 cm. Chaparral; 300–2000 m. NCoR, Teh, SnFrB, SCoR, SW (exc ChI); Baja CA. ☉DRN,SUN:1–6,7,9,14–24;STBL.

var. *wislizeni* (p. 665) Tree 10–22 m. LF: blade 2–5 cm. Canyons, slopes, pine/oak woodland; < 1600 m. NCoR, CaRF, SNF, SCoR, TR, PR; Baja CA. Hybridizes with *Q. agrifolia*, *Q. kelloggii*. ☉DRN,SUN:4–6,7,14–17,22–24&IRR:8,9,18–21.

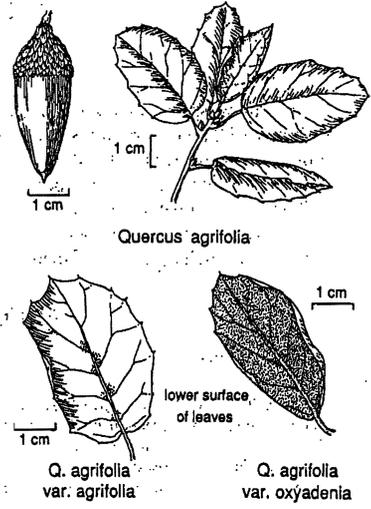


var. densiflorus
Lithocarpus densiflorus

var. echinoides



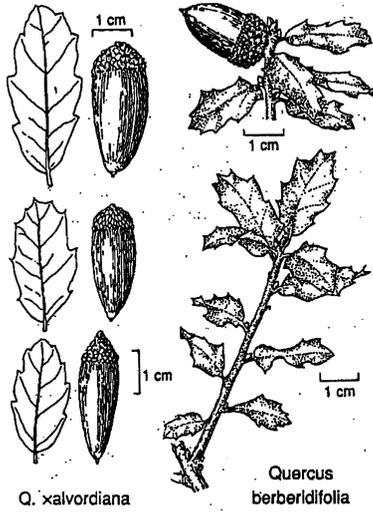
Quercus xacutidens



Quercus agrifolia

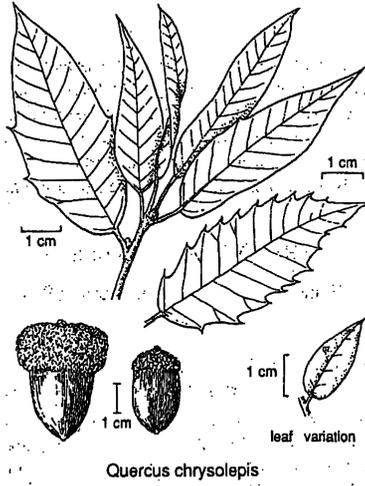
Q. agrifolia
var. agrifolia

Q. agrifolia
var. oxyadenia



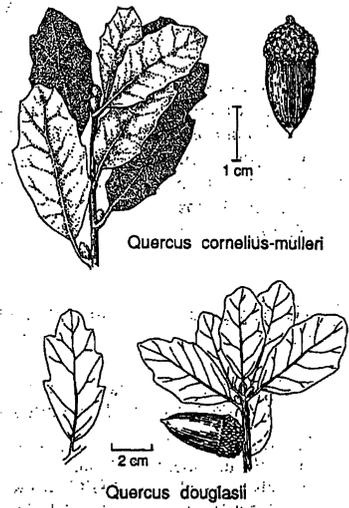
Q. xalvordiana

Quercus
berberidifolia



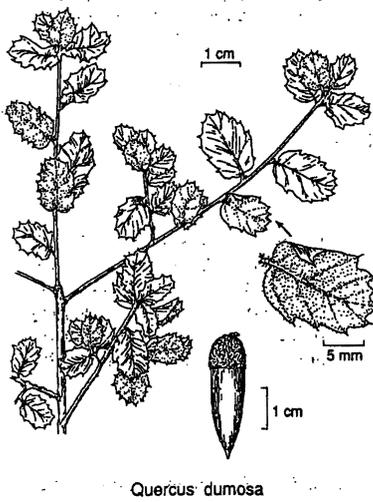
Quercus chrysolepis

leaf variation

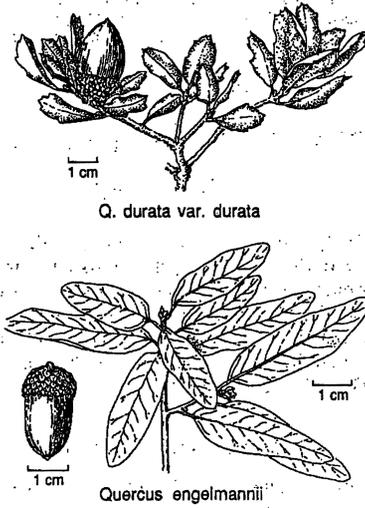


Quercus cornelius-mulleri

Quercus douglasii

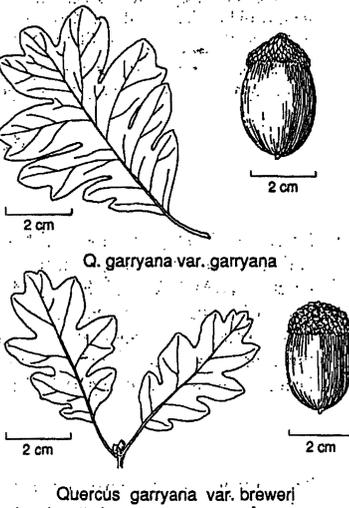


Quercus dumosa



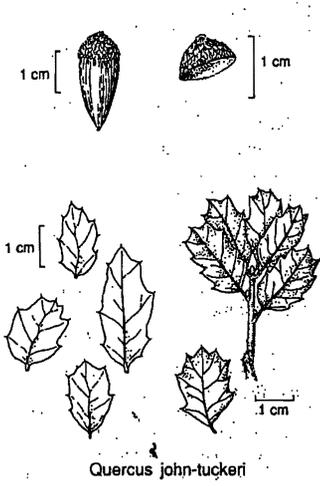
Q. durata var. durata

Quercus engelmannii

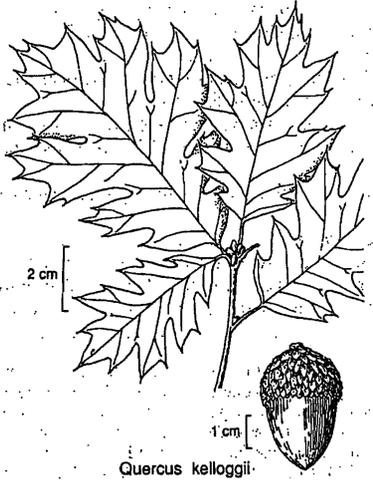


Q. garryana var. garryana

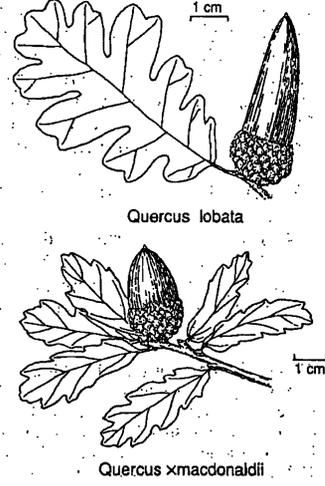
Quercus garryana var. breweri



Quercus john-tuckeri

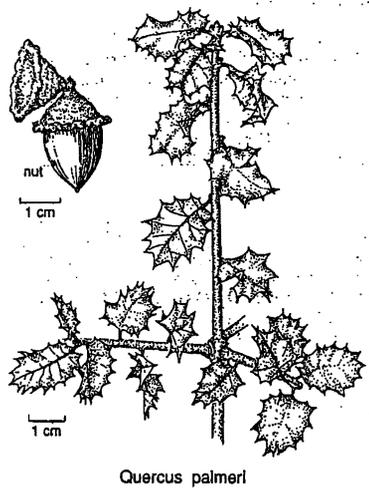


Quercus kelloggii

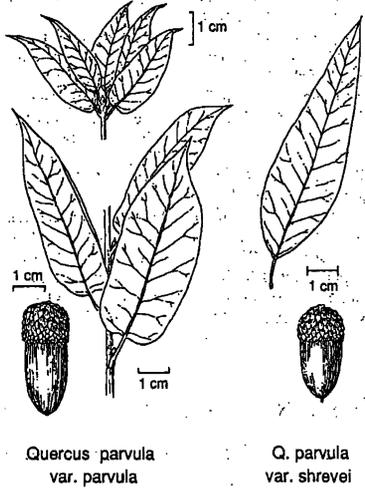


Quercus lobata

Quercus xmacdonaldii

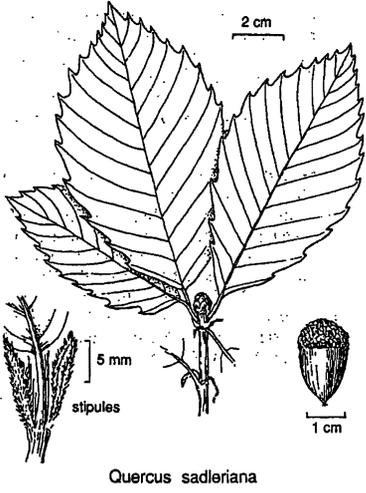


Quercus palmeri

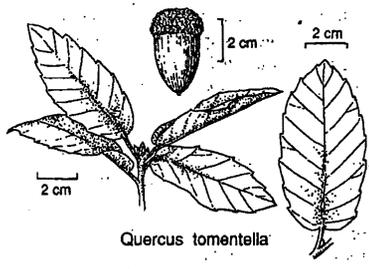


Quercus parvula
var. *parvula*

Q. parvula
var. *shrevei*



Quercus sadleriana

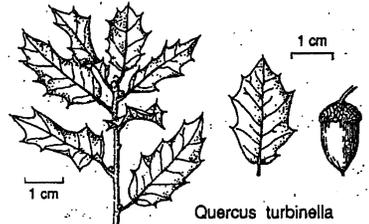


Quercus tomentella

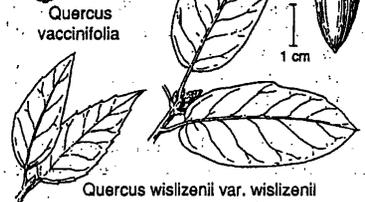


Q. wislizenii
var. *frutescens*

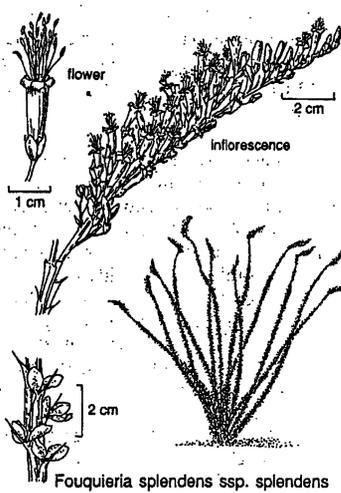
Quercus
vaccinifolia



Quercus turbinella



Quercus wislizenii var. *wislizenii*



Fouquieria splendens ssp. *splendens*
Fouquieriaceae

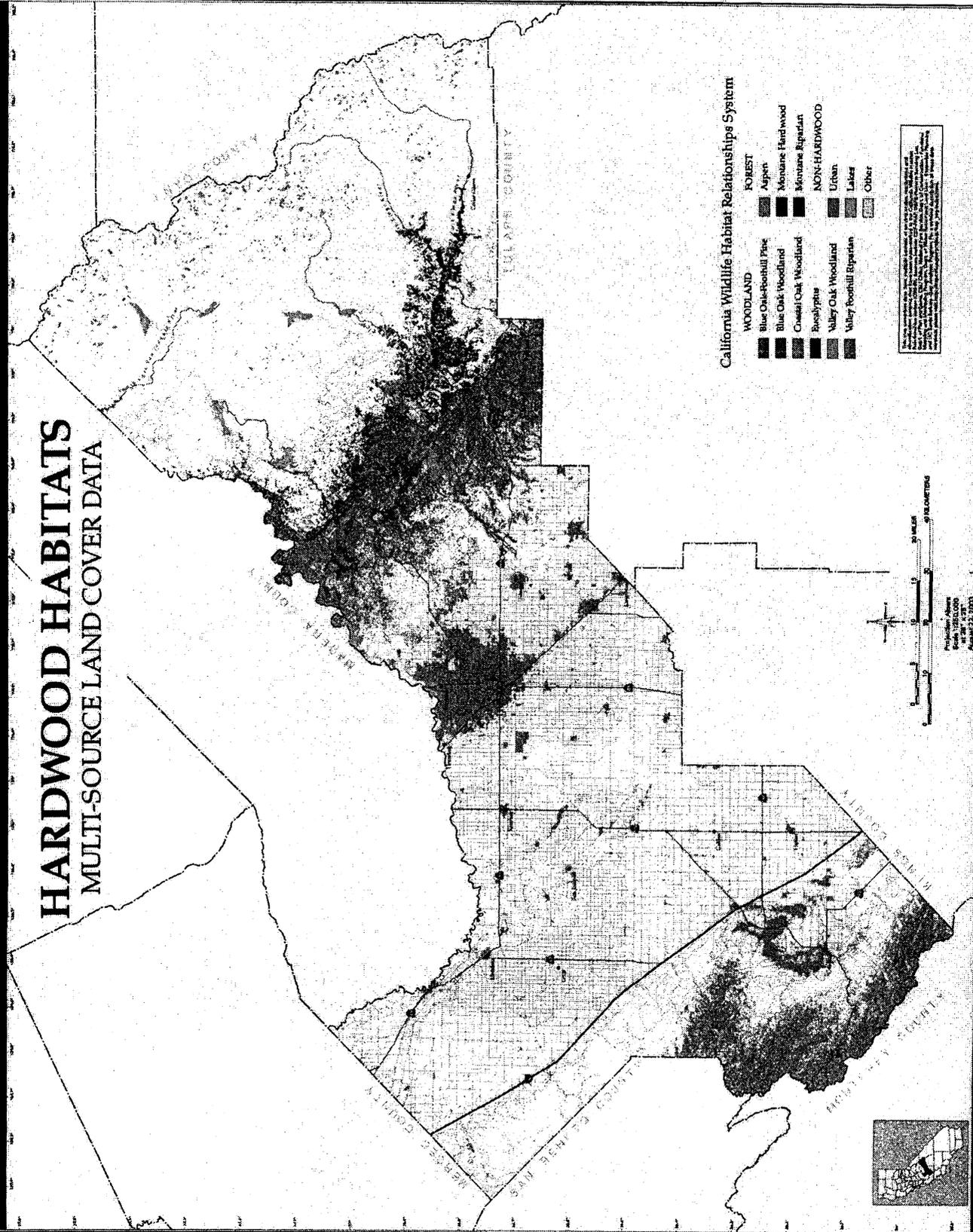
SECTION C

**FIRE AND RESOURCE PROTECTION (FRAP) MAP
HARDWOOD HABITATS IN FRESNO COUNTY**



FRESNO COUNTY

HARDWOOD HABITATS MULTI-SOURCE LAND COVER DATA



Map prepared by:
 State of California
 Department of Fish and Game
 Wildlife Resources Division
 1515 Clay Street
 Sacramento, CA 95833
 Date: 12/13/00