Trees in the landscape, Part 2: Eucalyptus spathulata

Donald R. Hodel

HE MERE MENTION OF Eucalyptus can send shudders down many peoples' spines and raise their ire to an extremely high level. This sometimes violent reaction is largely due to their experiences with a few notoriously inappropriate species of eucalypts used in the landscape that have unfortunately jaded their assessment of this large, diverse, and useful genus. Eucalyptus contains a treasure trove of many wonderful, useful, and appropriate species, many of which are little known and/or underutilized, and *E. spathulata* is one of them.

A highly adaptable species, *Eucalyptus spathulata* performs well and makes a handsome statement in the landscape, from the desert Southwest

Figure 1. Eucalyptus spathulata can grow up to 50 feet tall and as wide or wider and often has one or more large branches arising low on the trunk. Emerson Avenue, Santa Barbara, CA.



to coastal California. Its spreading, somewhat graceful nature, small, narrow, attractive gray-green leaves, and ultra smooth, colorful bark are sure to gain attention wherever it is grown. A tough and rugged species, it tolerates harsh conditions, including cold, heat, wind, smog, aridity, saline and alkaline soils, and sea coast exposure, and is extremely drought tolerant although occasional summer irrigation is beneficial in hot, desert areas. With proper management *E. spathulata* will become a small to medium, useful, and much admired tree.

as the swamp mallee. However, as used for this species, mallee is likely a corruption of mallet; a true mallee *Eucalyptus* has a lignotuber (round, swollen rootstock from which many, slender trunks arise) and is a shrub or small, shrubby tree, neither of which much applies to *E. spathulata*.

For the meaning of the common name gimlet I defer again to Matt Ritter (pers. comm.) who states that gimlets are a small group of eucalypts from mostly western and southern Australia characterized by their slender, fluted, twisted, shiny trunks,

Eucalyptus spathulata performs well and makes a handsome statement in the landscape, from the desert Southwest to coastal California.

Eucalyptus spathulata Hook Taxonomy and history

Synonyms: None

Common names: swamp mallet, narrow-leaved gimlet, swamp gimlet. According to Kelly et al. (1983), the common name mallet refers to the somewhat mallet-shaped or clubshaped fruits. However, Matt Ritter (pers. comm.) says that the common name mallet (pronounced môl'ēt) refers instead to a group of species with a specialized tree growth form found only in Western Australia and characterized by mostly slender, erect stems, steeply angled branches, and the lack of the regenerative structures of many other eucalypts, such as lignotubers and epicormic buds. Some web references incorrectly refer to this species leaves with irregularly arranged oil glands, and deeply fissured seed coats.

Etymology: The genus name *Eucalyptus* is derived from the Greek *eu*, meaning well, and *kalypto*, meaning to cover, and refers to the calyx that forms a lid (operculum) over the stamens and other interior organs of the flower in bud. The specific epithet or species name *spathulata* is derived from the Latin *spathulatus*, meaning a broad rounded upper part tapering gradually downward into a stalk (spoon-like), but the precise application of the name with this species is uncertain.

History: English botanist William Jackson Hooker (1785-1865) named

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Figure 2. (Left) *Eucalyptus spathulata* is often multi-trunked with two to three trunks arising at the ground, or has several large branches arising a few feet above the ground and branches are typically steeply ascending. Emerson Avenue, Santa Barbara, CA.

Figure 3. (Center) Trunks of *Eucalyptus spathulata* can become rather large with age, up to several feet in diameter. Emerson Avenue, Santa Barbara, CA.

Figure 4. (Right) Bark of *Eucalyptus spathulata* is ultra smooth, mottled, colorful and showy, usually brownish gray, reddish brown, coppery, or salmon-colored and typically with a glossy, metallic bronzy or coppery sheen. Emerson Avenue, Santa Barbara, CA.

and described this species in 1844, basing it on James Drummond's illustration of material from the Swan River in Western Australia.

Description

The description is from several sources (Brooker and Kleinig 1990, Chippendale 1988, Elliot and Jones 1986, Kelly et al. 1983, Muller and Haller 2005) and from cultivated trees in Santa Barbara, California.

Habit/conformation: small to medium, long-lived, evergreen tree 15-50 feet tall, 10-25 feet wide (Figs. 1, 9-10), infrequently shrub-like and then to 15 feet tall and 10 feet wide; often multi-trunked with 2-3 trunks arising at the ground or as large branches arising a few feet above the ground (Figs. 2-3), these typically steeply ascending, sometimes single-trunked; crown irregularly branched, moderately open to dense.

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Figure 5. (Left) Adult leaves of *Eucalyptus spathulata* are glossy olive green, gray-green, or bluish green. Note margins of some leaves with *Eucalyptus* tortoise beetle feeding damage. Los Angeles County Arboretum and Botanic Garden, Arcadia, CA.

Figure 6. (Right) Flowers of *Eucalyptus spathulata* are arranged in small, axillary, 7-flowered clusters. Los Angeles County Arboretum and Botanic Garden, Arcadia, CA.

Trunk(s): to 1-2 feet in diameter or even more in very old specimens (**Fig. 3**), typically relatively short, sometimes fluted at the base.

Bark: smooth, mottled, typically deciduous or shedding throughout on branches and trunk in irregular, mostly small to medium patches or flakes in early summer (desert areas) to mid summer (coastal areas); newly exposed bark is colorful and showy, usually brownish gray, reddish brown, coppery, or salmoncolored and typically with a glossy, metallic bronzy or coppery sheen (Fig. 4), sometimes aging to gray or brownish gray by fall before the next shedding.

Leaves: simple; juvenile opposite to alternate, petiole short, blade 2-2.75 × 0.2-0.3 inches, linear to narrow lance-shaped, dull blue- or gray-green; adult alternate, petiole short, 0.08-0.2 inch long, blade 1.75-4 × 0.1-0.4 inches, lance-shaped, tip often hook-like, glossy olive green, gray-green, or bluish green (**Fig. 5**), same color above and below, veins obscure, reticulation very sparse with numerous, round, conspicuous oil glands (**Fig. 7**).

Flowers: arranged in small, axillary, 7-flowered clusters (**Figs. 6-7**); pe-

duncle flattened or cylindrical, 0.15-0.9 inch long; buds on short pedicel, 0.4-0.7 × 0.1-0.3 inch, cylindrical or ovoid to broadly spindle-shaped; operculum or lid cylindrical to conical, reddish, hypanthium or base greenish; flower 0.8 inch wide when open, stamens erect, white or cream-colored (Fig. 7); summer.

Fruits: on short pedicel, $0.15-0.5 \times 0.15-0.5$ inch, hemispherical to obconical or pear-shaped, rim thick, disc level, valves 3 or 4, exserted (**Fig. 8**).

Distribution and ecology

Eucalyptus spathulata is endemic to Western Australia where it is widespread but scattered in the Avon, Eyre, and Roe Districts of the southwestern part of the state south of Perth, from Albany to Esperance along the coast and north to Katanning and Ravensthorpe. The climate is distinctly Mediterranean and very similar to that of coastal and inland valley areas of most of California, with warm to hot and dry, rainless summers and cool, usually moist winters. Rainfall averages 12 to 15 inches annually. Minimum winter temperatures are in the 20s F while summer maximums approach or exceed 100 F.

Eucalyptus spathulata frequents low-lying areas and depressions

(sometimes forming thickets) near seasonal lakes, marshlands, or water courses, many of which are highly saline. Soils are of various drainage capabilities, sandy or gravelly clays, or heavy loams with clay subsoil, alkaline or sometimes slightly acidic and often strongly saline (Brooker and Kleinig 1990, Chippendale 1988, Elliot and Jones 1986, Kelly et al. 1983).

Propagation and growth rate

Eucalyptus spathulata is readily propagated from seeds, which germinate in one to two weeks. Select seeds from fully mature capsules (fruits), which typically attain maturity within one year of flowering. Immediately after collection sow seeds by scattering lightly over a pre-moistened, clean, disease-free (pasteurized), well drained seed, or potting mix. Keep evenly moist at a temperature of 70 to 80 F and protect from wind, dryness, and extreme cold and heat. Transplant into individual containers when seedlings are sufficiently large to be handled easily. Grow seedlings in light shade but acclimate to full sun quickly. Eucalypt seedlings and young plants typically grow quickly, so move them up to larger containers regularly to prevent kinked, circling, girdling, or otherwise poor root systems that can be problematic later in the landscape. Peat pots/strips and



fluted gallon (and larger) containers can help to prevent such poor root characteristics.

Because *Eucalyptus spathulata* is propagated by seed and there is much variation in form and habit, selections with smaller leaves and denser foliage may be more horticulturally desirable for desert areas (Chris Martin pers. comm.) although selections with less dense foliage are suitable for coastal California where shade is not so critical.

A relatively fast-growing species when young, *Eucalyptus spathulata* can attain about 18 feet in height in only four years (Kelly et al. 1983) while UFEI (2011) listed its growth rate as two to three feet per year. Cultivated plants in South Australia have reached 30 feet tall in 13 years (Kelly et al. 1983). However, in western Arizona and California this species has typically grown to about 25 to 30 feet tall and at least as wide in 25 years and has trunks about one foot DBH.

Environmental tolerances

Several web sources list *Eucalyptus spathulata* for Sunset Zones 5 to 6 and 8 to 24 in the western United States. Thus, it is theoretically adapted to nearly the entire west coast and coastal plains and valleys from Seattle, Washington to San Diego, California,

the intermediate and interior valleys of California, and the low and high deserts of California, southern Nevada, and western Arizona. Much of this area in the southwestern United States falls within USDA Zones 9 to 11. However, E. spathulata is apparently not well adapted to humid tropical areas like Hawaii (Elliot and Jones 1986). Also, whether it would grow in the cold, damp Pacific Northwest is dubious when considering the climate in its native range in southwestern Australia. Brenzel (1995) listed the cold hardiness of E. spathulata as 15 to 20 F and it easily tolerates summer maximums exceeding 100 F.

A tough and rugged species, Eucalyptus spathulata tolerates harsh conditions, including cold, heat, wind, smog, aridity, and sea coast exposure, and is moderately drought tolerant although occasional summer irrigation is beneficial in hot, desert areas. It thrives in a variety of substrates, including heavy loams and clays, and seasonally inundated, poorly drained, compacted, and alkaline or slightly acidic soils. SHF (2011) reports that it performs better in wet, alkaline soils than it does in acidic soils. However, excessive water and nitrogen fertilizer may encourage succulent growth and weak wood. It is especially tolerant of extremely

high soil salinity up to an EC of 8 to 16 dS•m⁻¹ (WON 2008) and is recommended for planting in saline areas (Hart 1972).

As evidence of its widely adaptable nature, Eucalyptus spathulata has been successfully cultivated in coastal areas of California and the low and high deserts of California and Arizona. Libby Davison (pers. comm.) states that E. spathulata withstood the proverbial 1-in-100-year freeze of 17 F in 2011 in Tucson. However, she also noted that its placement in the low-desert landscape may be critical for long-term performance if not survival. When exposed to daily temperatures exceeding 100 F, trees in eastern exposures or with some shade in the afternoon performed well for many years while trees subjected to full, day-long sun and/or reflected light, like in a highway median or on the south or west side of a building, were sun- and/or heat-stressed and had much shortened functional life spans. Chris Martin (pers. comm.) concurs and feels that an overheated root zone from too much surrounding asphalt and concrete shortens the useful life of this species.

John Eisenhower (pers. comm.) reports that *Eucalyptus spathulata* grows unusually well, albeit sometimes slowly, to 40 or 50 feet, is well

Figure 7. (Left) Flowers of *Eucalyptus spathulata* are arranged in small, axillary, (3-)7-flowered clusters and have a cylindrical to conical, reddish operculum or lid and greenish hypanthium or base. Note the conspicuous oil glands on leaf on left. Los Angeles County Arboretum and Botanic Garden, Arcadia, CA.

Figure 8. (Right) Fruits of Eucalyptus spathulata are hemispherical to obconical or pear-shaped. Los Angeles County Arboretum and Botanic Garden, Arcadia, CA.







Figure 9. This Eucalyptus spathulata at The Huntington Library, Art Collections & Botanical Gardens in San Marino is about 30 years old, has two, steeply spreading trunks, each about eight inches DBH, and is about 30 feet tall and wide. Note the accumulation of dead twigs and small stems toward the branch ends.

adapted to the high clay content, high salinity, and high pH of the soils in the Phoenix area, and seems highly tolerant of wind.

Chris Martin (pers. comm.) notes that *Eucalyptus spathulata* planted out in 1992 in the Phoenix area, which has a similar if not harsher climate but similar soils as Tucson, are now 25 to 30 feet tall and slightly wider.

There is no information about its cultivation in southern Nevada but infrequent, severe cold typically severely damages or destroys most *Eucalyptus*. However, considering its fast growth rate and the infrequency of severely cold weather in southern Nevada, *E. spathulata* should be attempted there.

There is no information about how *Eucalyptus spathulata* would perform in turfgrass or groundcovers where it might be overwatered. However, it does grow naturally in seasonally wet or flooded areas so it might be tolerant of regular irrigation.

Uses

Eucalyptus spathulata fills a variety of uses in the urban forest and landscape and is especially useful in sites with poor soil and other harsh environmental conditions where most other species would be unsuitable and inappropriate. It finds use as a specimen, accent, shade, patio, background, screen, wind-break, and street tree. For street-tree use minimum parkway width and cutout size are probably four and six feet respectively and trees must have early, judicious pruning and training to establish and maintain a single trunk and elevated canopy. Indeed, maintaining an elevated canopy allows the trunks with their smooth, handsome, ornamental bark to be easily admired and appreciated (Martin 2011). Its relatively small size makes it ideal for residential use and limited planting spaces where it is more in scale with houses and low buildings. Although foliage can be dense towards the branch tips, the open, spreading branching habit allows the canopy to cast relatively light shade, increasing the number of groundcovers, shrubs, and other small plants that can be successfully grown below.

Pruning/management

Grow and/or select trees of upright form with a strong, straight central leader or trunks. Prune and train

young trees judiciously to maintain a strong trunk and a well balanced, spaced, and proportioned system of scaffold branches. Prune to establish and maintain a single trunk and an elevated canopy for street tree use or other situations where clearance is required. If judicious pruning and training is not done, Eucalyptus spathulata will likely be multi-trunked with a lowered canopy, which would then make it suitable as a background, screen, or wind-break. Older trees require no special pruning or management other than occasional thinning of crowded dead wood in the denser clumps of foliage towards the branch ends (Fig. 9). However, because wood of E. spathulata is especially strong, it is easily able to support the dense foliage and built-up dead wood so this thinning is mostly for cosmetic purposes (John Eisenhower, per. comm.) but should be done only sparingly (Chris Martin pers. comm.).

Chris Martin (pers. comm.) notes that neglecting young trees and then attempting to train them when older is less effective and fraught with problems, and the resulting, relatively large pruning wounds are especially esthetically unpleasing when set against the handsome trunk and they are slow to cover over.

Chris Martin also reports that *Eucalyptus spathulata* responds well to regular applications of a balanced fertilizer with micronutrients, especially iron, and regular irrigation, particularly in the summer.

Problems/litter

Eucalyptus spathulata is largely free of serious problems. Its hard, dense wood is not prone to breakage, even in high winds. Old, mature trees can produce an abundance of flowers and subsequent fruits. Because fruits are woody, hard, and rounded, like those of many other eucalypts and other species, they may be problematic on smooth hardscape surfaces like driveways and sidewalks. Bark, from normal late spring and early summer shedding, may accumulate beneath the tree. Leaves typically



drop in spring and early summer as new leaves appear while small stems and twigs senesce in summer and fall (Chris Martin pers. comm.), persisting and accumulating in bunches or clumps near branch ends.

Elliot and Jones (1986) report that mature trees in open and exposed situations may split near the base although this phenomenon is unknown in California and Arizona. However, because excessively heavy growth near branch ends may partly be responsible for the splitting, occasional thinning to reduce top weight might be beneficial.

In desert areas Eucalyptus spathulata may be somewhat tricky or difficult to establish in the landscape. In the Coachella Valley in the California desert Spencer Knight and Diane Hollinger (pers. comm.) note that this species is seldom used due to the apparent sensitivity to root disturbance during potting up in the nursery or planting out in the landscape. In Arizona Janet Rademacher (pers. comm.) reports that roots also seem fragile and sensitive to disturbance when planting out, and she recommends that the trees be handled carefully and gently to avoid root damage when planting. Don Waltemeyer (pers. comm.) states that the trees appear sensitive to lack of water during establishment, and he recommends regular, judicious irrigation during this period. Waltemeyer also notes that, like most other plants, E. spathulata is sensitive to too deep planting.

John Kelly (pers. comm.) notes that Eucalyptus spathulata sometimes has a tendency to uproot and lean or fall over. John theorizes that irrigating in a too small area, which promotes a confined, less extensive root system that provides less support and anchorage and is more likely to fail, is the probable cause of this failure. He recommends more extensive irrigation to encourage a more wide-ranging root system, which would better anchor the tree. Another possible cause of this type of failure is root bound or kinked, circling, or girdling roots, which were produced in the

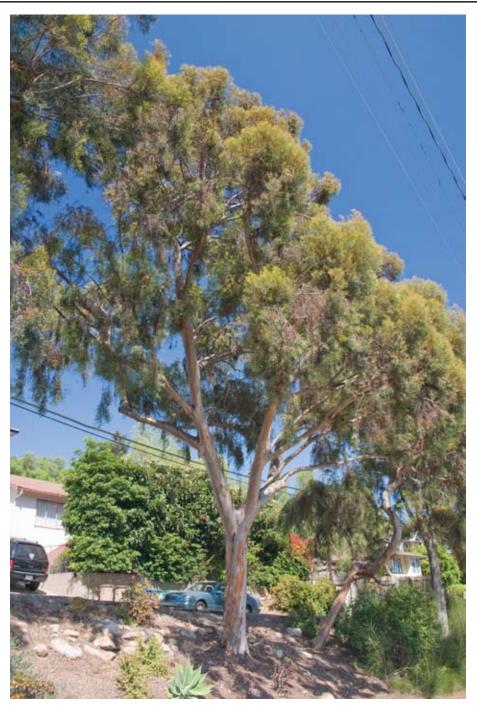


Figure 10. Santa Barbara has several *Eucalyptus spathulata* as street trees, and the specimens in the island on Emerson Ave. at Orena Way, about 60 feet tall and with multiple trunks one to two feet in diameter, are likely the largest in the United States.

nursery and are the result of delayed potting up.

Pests and diseases

Eucalyptus spathulata mostly has no serious pests and disease. Pests, such as psyllids, that plague species of the

related *Eucalyptus* and *Corymbia*, are unknown on *E. spathulata* in California and Arizona. However, I have observed slight leaf-margin cutting from *Eucalyptus* tortoise beetles in coastal California. UFEI (2011) reports that *E. spathulata* is resistant to Texas



root rot and *Verticillium* wilt but, like many trees, can be attacked by borers, oak root fungus (*Armillaria*), and *Phytophthora* root rot. In Arizona *E. spathulata* is reported to be susceptible to bacterial wet wood, which is typically spread on unsterilized pruning equipment (Martin 2011).

Availability

Despite its many attributes, *Eucalyptus spathulata* is rarely seen in the California and Arizona nursery industries. Two Arizona nurseries in the Phoenix area, Treeland Nursery in Mesa and Nakase Brothers Wholesale Nursery in Laveen, currently offer *E. spathulata*.

Trees in California and Arizona

Eucalyptus spathulata is rare in California. In Southern California The Huntington Library, Art Collections & Botanical Gardens in San Marino obtained a small plant in 1981 that now has two, steeply spreading trunks, each about eight inches DBH, and is about 30 feet tall and wide (Fig. 9). The Los Angeles County Arboretum and Botanic Garden in Arcadia obtained a small plant in 1997 that now is a large shrub or small tree about 15 feet tall and wide. Santa Barbara has several E. spathulata as street trees, and the specimens in the island on Emerson Ave. at Orena Way, about 60 feet tall and with multiple trunks one to two feet in diameter, are likely the largest in the United States (Figs. 1, 10). Also in southern California, Tony Rangel (pers. comm.) notes that several trees of Eucalyptus spathulata in the Palomar Community College Arboretum are about 25 feet tall and wide.

Matt Ritter (pers. comm.) reports that in the Bay Area in northern California noteworthy trees of *Eucalyptus spathulata* about 40 feet tall grow near the Oakland Coliseum and the I-880 Freeway at the 66th Street on-ramp. Several old trees, also about 40 feet tall, are in Fremont in Central Park near Paseo Padre Parkway.

Matt also notes that trees of *Eucalyptus spathulata* planted 25 years ago in the Leaning Pine Arboretum on

the campus of California Polytechnic State University in San Luis Obispo are about 30 feet tall and have trunks over one foot DBH with several steeply ascending scaffold branches.

Eucalyptus spathulata seems more widely planted in the Tucson and Phoenix areas of Arizona. In Tucson trees south of Centennial Hall at The University of Arizona are about 20 feet tall with trunks 15 inches or more DBH after 20 years. Additional trees are in the median of Campbell Avenue (Libby Davison pers. comm.).

Eucalyptus spathulata is scattered throughout the Phoenix area and the largest tree, a majestic specimen 50 feet tall and wide is at Baker's Retail Nursery on North 40th Street at East Osborn Road (Chris Martin pers. comm.).

Notes

The eucalypts include about 700 species comprising three genera, Eucalyptus (ca. 600 species), Angophora (seven species), and the recently segregated Corymbia (ca. 100 species). Angophora differs from Eucalyptus and Corymbia in its adult leaves oppositely arranged on the twigs and flowers having bristly glands interspersed with white hairs and distinct sepal and petal lobes but lacking an operculum (cap or lid formed by sepals and petals that falls off as flower opens). Corymbia differs from Eucalyptus in its flowers arranged in corymbs, a structure where individual flower stalks arise from different levels on the twigs but all flowers are held in more or less the same plane.

Matt Ritter (pers. comm.) notes that *Eucalyptus spathulata* is closely related to a group of mallees and mallets characterized by their glazed leaf surfaces, leaves with densely arranged oil glands that obscure venation, spreading inflorescences with long and flattened peduncles, and flower buds with a long operculum and typically fully erect stamens.

Two subspecies of *Eucalyptus* spathulata are recognized. *E. spathulata* ssp. spathulata is generally a larger plant and tree, has narrower, linear-

lanceolate leaves 0.08 to 0.2 inch wide, flower buds in groups of seven, and hemispherical fruits. The less common *E. spathulata* ssp. *grandiflora* is generally a smaller, shrub-like tree or large shrub, has wider, narrowly elliptic leaves 0.2 to 0.4 inch wide, flower buds in groups of three, and pear-shaped fruits.

Although the wood of *Eucalyptus spathulata* is hard and dense, it has no commercial value. The flowers are attractive to bees and are useful for honey production (Elliot and Jones 1986). The wood and especially the bark are rich in tannins (Penfield and Willis 1961).

Acknowledgements

Several people shared information with me or showed me living specimens of Eucalyptus spathulata in southern California, including Susan Eubanks, librarian, and James E. Henrich, botanist, both at the Los Angeles County Arboretum and Botanic Garden in Arcadia; Kathy Musial, curator of living collections, and Shadi Shihab, curator of the palm and the Australian garden, at The Huntington Library, Art Collections, and Botanical Gardens in San Marino; Spencer Knight, landscape manager, and Diane Hollinger, landscape specialist, both with the city of Palm Desert; and Tony Rangel, Palomar Community College, San Marcos.

In Arizona several people shared information about Eucalyptus spathulata, including Libby Davison, a consulting arborist in Tucson, John Eisenhower, a consulting arborist and owner of Integrity Tree Service, Inc. in Phoenix, Chris Martin, professor in the Department of Applied Sciences and Mathematics, Arizona State University in Tempe; Janet Rademacher, Mountain States Nursery near Phoenix; John Kelly, formerly of the University of Arizona Cooperative Extension in Tucson; and Don Waltemeyer, owner of Treeland Nursery in Mesa.

Robert Muller, director of research at the Santa Barbara Botanic Garden and co-author of the superb book *Trees*



of Santa Barbara, discussed Eucalyptus spathulata with me. My colleagues Mike Henry, Janet Hartin, and Dennis Pittenger helped to locate people knowledgeable about *E. spathulata* in the Coachella Valley in the California desert. Matt Ritter, author and botany professor at California Polytechnic State University at San Luis Obispo and an unusually well versed and accomplished student of the eucalypts, provided much information about E. spathulata in California and eucalypts in general. Matt, James E. Henrich, Ken Greby, Chris Martin, and Libby Davison critically reviewed the manuscript and offered valuable suggestions.

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Photos by Donald R. Hodel

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