***Ziziphus obtusifolia* (Hook. ex Torr. & Gray) Gray** graythorn
RHAMNACEAE

Synonyms: *Condalia obtusifolia* (Hook.) Weberbauer
Condalia lycioides (Gray) Weberbauer
Zizyphus lycioides Gray

General Description.—Graythorn is also known as lote bush, southwestern condalia, prairie bush, or thornbush. This shrub reaches heights of 2 to 3 m but is often shorter. Stems are grayish green due to a whitish or grayish wax-like bloom, which helps to distinguish *Ziziphus* from *Condalia*. The stems are robust, grooved, highly branched, although terminal branches are short, and bear stout spine-tips. The stem branching pattern gives this shrub an irregular shape. Side branches tend to come out at right angles from the main axis. The leaves are alternate, simple, generally less than 2.5 cm long, range from 0.4 to 0.7 cm in width, are ovate, oblong, or elliptic with three main veins. Leaf shape is variable which has lead to some confusion in identification. Leaves are dropped during dry periods (Carter 1997, Correll and Johnston 1979, Great Plains Flora Association 1986, Kearney and others 1951, Martin and Hutchins 1980-81).

Taxonomy.—This shrub has a somewhat complicated proliferation of taxonomic names. Two varieties are recognized: *Ziziphus obtusifolia* var. *canescens* (Gray) M.C. Johnston; and the typical variety *Z. obtusifolia* var. *obtusifolia*. Synonyms for variety *canescens* are: *Condalia lycioides* (Gray) Weberb. var. *canescens* (Gray) Trel.; *Zizyphus lycioides* Gray var. *canescens* Gray; and *Condaliopsis lycioides* var. *canescens* (Gray) Suess. Synonyms for variety *obtusifolia* are: *Condalia lycioides* (Gray) Weberb., including var. *lycioides*; *Condalia obtusifolia* (Hook. ex Torr. & Gray) Weberb.; *Zizyphus lycioides* Gray; and *Condaliopsis lycioides* (Gray) Suess. (Allred 2002, Kartesz 1994).

Range.—This species occurs from just a few counties in southwestern Oklahoma (McCoy 1981), portions of central and western Texas, through southern New Mexico to northwestern Arizona and southeastern California and south well into Mexico. It occurs at a wide elevational range from about 300 m to 1,525 m. Populations in the more western portions of its range are variety *canescens* (Kearney and others 1951).

Ecology.—Graythorn will grow in a variety of situations from silty and sandy floodplains and washes to gravelly slopes and plains in desert grasslands and scrublands. This species tends to be diffusely distributed within its local habitat, but may also form thickets. This species is considered a characteristic component of Chihuahuan desert scrub and a diagnostic climax indicator species of desert grassland (Dick-Peddie 1993). In a northern Texas study, although graythorn had a minimal influence on overall grass cover, there appeared to be differences in species distributions around graythorn bushes (Foster and others 1984). Buffalo grass [*Buchloe dactyloides* (Nutt.) Engelm.] was more abundant near graythorn than in shrub free zones, while Texas winter- or needlegrass (*Stipa leucotricha* Trin. & Rupr.) cover and standing crop was greater away from graythorn. A study conducted in a savanna parkland habitat in southern Texas showed that graythorn is a deciduous shrub with an average leaf lifespan measured at 66 days (Nelson and others 2002). Supplemental watering had no detectable effect on leaf longevity. Root infection with symbiotic strains of *Frankia* and *Rhizobium* did not occur on four species of Rhamnaceae from southern Texas, including graythorn, when planted in pots in the laboratory, in a 1:1 native soil (with symbionts) to vermiculite substrate (Zitzer and others 1996).

Reproduction.—Flowers of graythorn are small, inconspicuous, and occur in axillary cymes of two to seven flowers. The five-petalled flowers are greenish yellow. Graythorn may bloom at various times during the growing season, from May through September, depending on the availability of moisture. The fruit is a dark blue to black globose drupe, 6 to 10 mm long, covered with a whitish bloom, and matures from July into early October. Seeds are nondormant, but the seed coats are impermeable to water, hence are classified as physically dormant (Baskin and Baskin 2001). Physically dormant seeds need some type of scarification of the seed coat to initiate water penetration and germination. Optimal germination occurs at 25 °C. Both light and prechilling maximized the percent germination (Speer and Wright 1981, Young and Young 1992). Graythorn seeds from the lower Rio Grande valley in southern Texas did not need pretreatment for germination (Vora 1989).

Growth and Management.—Graythorn stem regeneration generally occurs just below the cut or removed portion. When stems are removed to the ground line, regeneration will occur from the root crown, and stems can be regenerated from roots, but generally only when the root crown itself is removed (Flinn and others 1992). Graythorn may demonstrate rapid growth when resprouting from cut stumps or during periods of good moisture but is generally a slow growing shrub. Although this species may on occasion become locally dense and form thickets, it is generally a species that is diffusely distributed within its habitat, such that management should not be a problem.

Benefits.—The fruits are readily eaten by birds such as Gambel's quail and white-winged doves. Graythorn was among several shrubs in a northern Mexico study testing the preferred browse composition and digestibility of foliage. Graythorn was grouped with species having a high crude protein content, lower cell wall content, and smoother or waxy leaf surfaces with the absence of trichomes. Range goats and white-tailed deer included graythorn as an important part of their diets (Ramirez and others 1997). In another nutrient study in northern Mexico (Ramirez and others 2001) graythorn was among several shrubs studied for seasonal mineral levels. General mineral concentrations were higher in the spring and summer, but only calcium, magnesium, potassium, and iron were at levels to meet adult goat requirements during all seasons. Phosphorus was low in all seasons except the spring. Native Americans have used the plant for medicinal purposes. Pima Indians have steeped the roots in water and applied them to sore eyes. Seri Indians have powdered the roots for application to skin and scalp sores. Solutions made from roots also served as a soap substitute (Bowers and Wignall 1993, Epple 1995, Kearney and others 1951).

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