

Figures 1 and 2: Desert Broom (*Baccharis sarothroides*). Photos courtesy Doug Ripley

# Opportunistic Weedy Native Sonoran Desert Plants in Arizona by Matthew B. Johnson<sup>1</sup>

In recent decades, much attention has been focused on non-native invasive species that threaten our native plant communities, and rightly so. These plants pose serious threats as ecosystem weeds that displace indigenous species and disrupt ecosystem processes, especially by altering the fire regimes of our desert plant communities that did not evolve with fire. In the Sonoran Desert, buffelgrass, fountain grass, Sahara mustard, and red brome are having major and increasing impacts primarily by providing a source of contiguous biomass that dries out and provides fuel for wildfires.

Since before recorded history, humans have intentionally and unintentionally been vectors for moving plants, animals, and disease organisms to regions where they did not previously occur. Our economic activities including agriculture, urbanization, mining, and road infrastructure create disturbances that favor weedy plants. Once introduced into a new region, some plants have the ability to move into relatively undisturbed native plant communities where they negatively impact native plants and the wildlife that depends on those plants. Many plants, both native and exotic, are well-adapted to exploit disturbed sites and become “weedy.”

Defining a weed is subjective. A simple definition of a weed is a plant that is growing where it is not wanted. For most people, the idea that a native plant can be considered a weed in some situations is probably not often considered. Our native plants play important roles in their ecosystems. But several stand out for their ability, in some circumstances, to greatly increase their numbers on disturbed lands and become weedy. Disturbances resulting from human activity provide ideal conditions for these plants to increase at the expense of other species. They are then perceived as weeds by the humans who are responsible for creating the disturbances that led to the plants spreading and increasing in the first place!

Desert broom, burroweed, creosote bush, Mexican palo verde, and sweet acacia are just a few examples of native plants that can become weedy in urban and disturbed areas.

Desert Broom (*Baccharis sarothroides*), in the Asteraceae (Aster Family), is known to most residents of southern and central Arizona for the wind-borne, cottony white “fuzz” that accumulates in drifts when the plants are fruiting in the autumn (Figures 1 and 2). The vegetative growth of desert broom is an attractive bright green and the flowers are an important nectar source for pollinators. Desert broom occurs primarily along larger arroyos and floodplains where it benefits from periodic disturbances caused by flooding. But the seeds are perfectly happy to germinate in soil that has been

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Figures 3 and 4: Burrowweed (*Isocoma tenuisecta*). Photos courtesy Liz Makings

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disturbed by human activity particularly if extra moisture is available. The plants grow quickly and soon reach reproductive maturity. They can rapidly colonize abandoned agricultural land and find road shoulders, alleys, vacant lots, and urban landscapes to their liking. In landscape settings a desert broom can quickly overtop the plant under which it germinated. Desert broom develops a deep, strong taproot and requires considerable effort to remove once established, especially if their “nurse plant” happens to be armed with spines or thorns. Desert broom was a problem plant in urban settings in Tucson during the 1980s and 90s. Since then, in part due to the ongoing drought, its abundance in urban areas seems to have diminished.

Burrowweed (*Isocoma tenuisecta*), in the Asteraceae (Aster Family), is found primarily in the southeastern quarter of Arizona (Figures 3 and 4). This low, shrubby plant is able to colonize open ground and rapidly increases in abundance on overgrazed or disturbed soil as long as there is sufficient moisture (Roundy and Biedenbender 1995). Extensive areas that formerly supported native grasses are now dominated by burrowweed. While useful in helping to protect the soil in the absence of other plants, burrowweed is toxic to livestock. Animals may eat the plants when other forage is unavailable and humans have been affected by drinking milk from cows that have browsed on burrowweed (Parker 1972).

Creosote Bush (*Larrea tridentata*), in the Zygophyllaceae (Caltrop Family), originated from a South American ancestor that reached North America many millennia ago (Figures 5 and 6). It was present in Arizona during the height of the last

glacial period and has been expanding its distribution in the United States since then. Creosote bush is a major element of plant communities over large areas of the Chihuahuan, Mohave, and Sonoran Deserts. The plants tolerate extremes of heat and aridity. It is a colonizer species, able to germinate and establish on bare ground. In favorable valley habitats creosote can form a near monoculture with few other perennial species present. Creosote bush is appreciated by many for its distinctive aroma following rains and valued by native peoples for traditional medicinal uses. But where creosote has become well-established on overgrazed and degraded rangeland, many of the perennial native grasses and forbs have difficulty recolonizing those areas even when protected from grazing. A study by Mahall and Callaway (1991) demonstrated the ability of creosote bush roots to inhibit root development of white bursage (*Ambrosia dumosa*). The ability of creosote to dominate large areas can lead to a reduction in diversity.

Mexican Palo Verde or Retama (*Parkinsonia aculeata*), in the Fabaceae (Pea Family), likely arrived in Arizona following European colonization but is often considered to be native (Figures 7 and 8). It has been widely introduced in warm regions of the world and frequently naturalizes. In Arizona, Mexican palo verde is now rarely planted as a landscape tree due to its spiny stems, messy leaf litter, and short life span. Several hybrid selections involving Mexican palo verde have been developed that offer unarmed plants with less litter. Naturally occurring hybrids, primarily with the native *Parkinsonia microphylla*, are not uncommon. Mexican palo verde readily germinates along roadsides, in vacant lots, alleys,

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Figures 5 and 6: Creosote Bush (*Larrea tridentata*). Photos courtesy Doug Ripley and Sue Carnahan

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and arroyos in urban areas and sometimes in natural vegetation in locations remote from settlements. The plants grow vigorously and can quickly form spiny thickets. The long, slender, leaf rachises form a dense thatch on the soil surface beneath the canopy. This thatch appears to retard the germination of native ephemerals. Mexican palo verdes frequently succumb to the larvae of the palo verde borer (*Derobrachus germinatus*) which feed on the roots.

Western Honey Mesquite (*Prosopis glandulosa* var. *torreyana*) (Figures 9 and 10) and Velvet Mesquite (*Prosopis velutina*) (Figures 11 and 12), in the Fabaceae (Pea Family), are both conspicuous native plants within their ranges in Arizona. Both taxa are important for wildlife and were a valued

resource for native peoples. They are planted as landscape trees in the state. Mesquite products are growing in popularity and mesquite has considerable potential as a multipurpose tree crop for arid and semi-arid lands. At elevations above the deserts in Arizona, mesquites were historically mostly confined to floodplains along larger watercourses where they formed extensive woodlands or bosques. Several species of mesquite have become serious weeds in warm regions of the world (e.g., Australia, Africa, and Asia) where they were introduced. Our native mesquites can rapidly increase on overgrazed rangeland where there is no longer sufficient fuel to carry wildfires. Livestock readily consume the sweet fruits and the hard seed coats are scarified in the digestive tracts of

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Figures 7 and 8: Mexican Palo Verde or Retama (*Parkinsonia aculeata*). Photos courtesy R.A. Villa and Liz Makings

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the animals. It is not uncommon to find mesquite seedlings emerging from “cow patties” during the summer months. Many methods have been employed in attempts to control mesquite on rangeland. The mesquites persist and continue to take advantage of ongoing human-caused disturbances. In addition, Texas honey mesquite, the non-native, eastern *Prosopis glandulosa* var. *glandulosa* has been spreading along major highways in southern Arizona at least since the 1970s.

The plants were apparently introduced from seeds in the manure of livestock being transported from Texas through Arizona.

Sweet Acacia (*Vachellia farnesiana*), in the Fabaceae (Pea Family), is widely distributed in the American tropics and subtropics. It is widespread in Sonora and is historically known from apparently naturally occurring populations along the Baboquivari Mountains in southern Arizona (Figures 13 and 14). This species has been extensively introduced into warm regions around the world where it has not infrequently become invasive. Sweet acacia is commonly planted as a landscape tree in desert regions of southern and central Arizona where it is appreciated for its shade, lacy



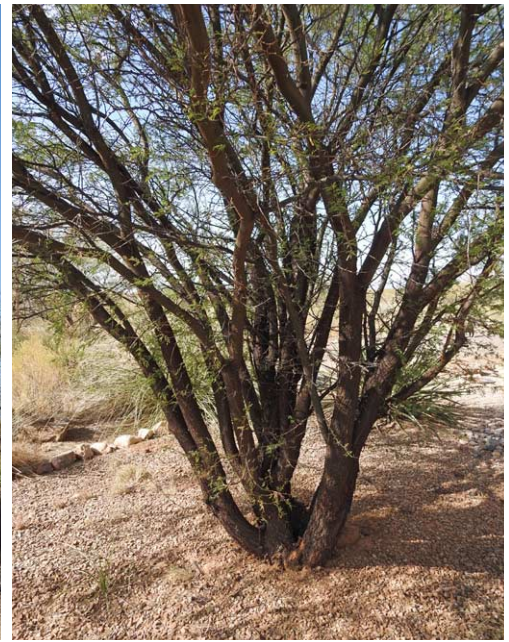
Figures 9 and 10: Western Honey Mesquite (*Prosopis glandulosa* var. *torreyana*). Photos courtesy L.H. Landrum

foliage, and showy displays of extremely fragrant flowers (Figure 15). Sweet acacia grows rapidly with sufficient irrigation. In landscape settings where irrigation is limited and other sources of moisture are not available, the plants often decline and suffer extensive die-back. In the past two decades, sweet acacia has increasingly shown up as a volunteer along roadways in southern Arizona, often well away from any developed areas that might have landscape plants to serve as a source of seeds. The extra moisture afforded by the pavement benefits the volunteer sweet acacias. Along an arroyo on the south side of Tucson at least a half mile from the nearest development, numerous large sweet acacias were recently observed. These trees are estimated to be at least 25 years old

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Figures 11 and 12: Velvet Mesquite (*Prosopis velutina*). Photos courtesy Doug Ripley



Figures 13 and 14: Sweet Acacia (*Vachellia farnesiana*). Photos courtesy Doug Ripley

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and appear to be doing well. Like some other native plants, sweet acacia is opportunistic and will take advantage of disturbed locations to become established beyond its historical range.

These examples illustrate the ability of some native Arizona species to become weeds as a result of disturbances that result primarily from human activity. There are certainly other potentially weedy native species. All they require is a suitably disturbed site and the proper environmental conditions.



### Literature cited

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Figure 15: Sweet Acacia (*Vachellia farnesiana*) flowers. Photo courtesy Stephen Hale