KEY BY LEAF DESCRIPTION FOLLOWED BY FLOWER DESCRIPTION PLANT ID KEY (TO FAMILY AND SOMETIMES SPECIES) FOR ARCHES NATIONAL PARK

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EVERGREEN TREES

- 1. Leaves opposite or in whorls, evergreen scale-like leaves Cupressaceae (Cypress)
- 2. Leaves spirally arranged, needles in groups of 2 Pinaceae (Pine)

EVERGREEN SHRUBS

1. Leaves are reduced to small triangular teeth at joints, green jointed stems, shrublike – **Ephedraceae (Jointfir)**

DECIDUOUS TREES

- 1. Leaves opposite
 - A. Leaves simple
 - i. Flowers with no petals, 4 yellow to whitish lobed sepals Oleaceae (Olive)
 - ii. Flowers with 5 united white petals and 5 united sepals Bignoniaceae (Catalpa)
 - B. Leaves compound
 - i. No petals, 4 -5 greenish, yellow sepals Aceraceae (Maple) – Boxelder (Acer negundo)
- 2. Leaves alternate
 - A. Leaves scale-like, 5 fragrant white to lavender petals, 5 sepals, flowers borne in elongated clusters **Tamaricaceae (Tamarisk)**
 - B. Leaves simple
 - i. Flowers with 0 petals
 - a. Flowers with no petals, shrublike, 2 to 8 greenish, yellow sepals Fagaceae (Beech) (also listed under shrubs)
 - b. Flowers with no petals, borne in axillary clusters, yellow or yellow-green sepals (generally 4) – Elaeagnaceae (Oleaster)
 - c. Flowers with 0 petals; 4-8 green sepals; flowers borne in clusters **Ulmaceae (Elm)**
 - ii. Flowers with no petals, 0-4 sepals, stamens 1 to many; borne in catkins
 - a. Male (staminate) flowers and female (pistillate) flowers on separate trees. Borne in catkins. No sepals, greenish, yellow Salicaeae (Willow)

- b. Male (staminate) flowers and female (pistillate) flowers on the same tree. Borne in catkins. Staminate flowers have 0-4 sepals, pistillate flowers have no sepals. Greenish, yellow – Betulaceae (Birch)
- Male (staminate) flowers and female (pistillate) flowers on the same tree. Borne in catkins. No petals, 4 sepals, 4 stamens, 1 pistil Moraceae (Mulberry) Morus alba
- d. Male (staminate) flowers and female (pistillate) flowers on different trees. Borne in catkins. No petals, 4 sepals, 4 stamens, 1 pistil Moraceae (Mulberry) Morus rubra
- B. Leaves compound, 5 white or pale pink petals, 5 sepals Fabaceae (Pea) – Robinia pseudoacacia

SHRUBS

- 1. Leaves opposite
 - A. Leaves simple
 - i. Flowers with 0 petals -
 - a. Yellow flowers with no petals, 4 yellow sepals Rosaceae (Rose)– Coleogyne ramosissima (others in shrubs -alternate, simple, 0 petals; shrubs – alternate, simple, 5 petals; and shrubs – alternate, compound, 5 petals)
 - b. Plants parasitic on branches of trees and shrubs; without chlorophyll; fragile-jointed with swollen jointed nodes; leathery (often scale-like) leaves; flowers with 0 petals; 2-5 sepals; staminate and pistillate flowers - Viscaceae (Mistletoe)
 - ii. Flowers with 4 distinct petals, 4 sepals
 - a. 4 distinct small white petals in terminal cymes, 4 very small sepals. Not commonly seen. Cornaceae (Dogwood): Cornus sericea var. sericea
 - b. Flowers with 4 white clawed petals, 4 sepals Saxifragaceae (Saxifrage) – Fendlera rupicola (others in shrubs-alternate, simple)
 - iii. Flowers with 5 united petals, 5 small sepals
 - a. Leaves oval, flowers pink, tubular and flare open at the mouth; flowers solitary or in pairs **Caprifoliaceae** (Honeysuckle)
 - b. Leaves narrow, flowers purple Lamiaceae (Mint) Poliomintha incana
- 2. Leaves alternate
 - A. Leaves simple
 - i. Flowers appear to be a single flower, but are composed of several flowers; flowers can be yellow, white, purple, pink or greenish– some **Asteraceae (Sunflower)**
 - ii. Flowers with no petals

- a. leaves bluish, small, 2-5 green, yellow, or brown sepals –
 Chenopodiaceae (Goosefoot) (others in subshrubs and herbs)
- b. 3 to 6 petaloid whitish sepals Polygonaceae
 (Buckwheat) Eriogonum bicolor, Eriogonum microthecum, Eriogonum leptocladon (others in subshrubs and herbs – alternate, simple and herbs - basal, simple)
- c. 4 yellowish, brownish sepals Rosaceae (Rose) Cercocarpus (others in shrubs -alternate, simple, 5 petals; shrubs – alternate, compound, 5 petals; and shrubs -opposite, simple, 0 petals)
- d. 2 to 8 greenish, yellow sepals Fagaceae (Beech) also listed under trees
- iii. Flowers with 4-5 petals, 4-5 sepals
 - a. 4 or 5 whitish green petals, distinct, or absent; 4 or 5 united sepals; flowers grow in clusters in the angle between the leaf and the stem; shrub 3-8 feet tall **Rhamnaceae (Buckthorn)** *Rhamnus betulifolia*
 - Flowers with 5 (4) white petals often smaller than the sepals, 5 sepals, mostly petaloid Saxifragaceae (Saxifrage) Ribes inerme (others in shrubs opposite, simple)
 - c. 5 petals, 5 sepals, flowers white, cream, yellow, or pink –
 Rosaceae (Rose) Amelanchier, Holodiscus, Petrophytum, Physocarpos, Purshia (others in shrubs -alternate, simple, 0 petals; shrubs – alternate, compound, 5 petals; and shrubs opposite, simple, 0 petals)
 - *d.* 5 yellow petals, 5 sepals **Anacardiaceae (Cashew)** some *Rhus aromatica*
- B. Leaves compound
 - i. Flowers with 0 petals, 5 sepals; yellow **Fabaceae (Pea)** *Parryella filifolia*
 - ii. Flowers with 5 yellow petals, 5 sepals Anacardiaceae (Cashew) – Rhus glabra, some Rhus aromatica, and Toxicodendron rydbergii - rarely simple
 - iii. Flowers with 5 pink (rarely white) petals, sepals 5 Rosaceae
 (Rose) Rosa woodsii (others in shrubs -alternate, simple, 0 petals; shrubs alternate, simple, 5 petals; and shrubs -opposite, simple, 0 petals)
 - iv. Flowers with 6 yellow petals, usually 6 sepals **Berberidaceae** (Barberry)

SUBSHRUB

- 1. Leaves whorled
 - A. Leaves simple
 - i. 4 lobed funnelform greenish-yellow petals, 4-8 lobed sepals, minute

or lacking - **Rubiaceae (Madder)** – *Galium multiflorum* (others in herbs -whorled, simple, 4 petals)

- 2. Leaves basal
 - A. Leaves simple
 - i. 0 petals, 3 to 6 petaloid whitish sepals, woolly leaves –
 Polygonaceae (Buckwheat) Eriogonum ovalifolium (others in shrubs and herbs-alternate, simple and herbs-basal, simple)
- 3. Leaves opposite
 - A. Leaves simple
 - i. Flowers with 5 petals, 5 sepals
 - a. 5 white to cream tubular petals, 5 sepals some
 Polemoniaceae (Phlox) Leptodactylon watsonii (others in herbs, opposite, simple: Phlox; and herbs, alternate, simple: Gilia)
- 4. Leaves alternate
 - A. Leaves simple
 - Yellow flowers appear to be a single flower, but are composed of several flowers – Asteraceae (Sunflower) - some Gutierrezia (others in shrubs), some Haplopappus (others in herbs), some Perityle (others in herbs), some Xlyorhiza (others in herbs)
 - ii. Flowers with no petals
 - a. leaves bluish, small, 2-5 green, yellow, or brown sepals **Chenopodiaceae (Goosefoot)** (others in shrubs and herbs)
 - b. 0 petals, 3 to 6 petaloid whitish sepals Polygonaceae (Buckwheat)– Eriogonum jonesii (others in shrubs, subshrubs, basal, simple) and herbs-alternate, simple and herbs-basal, simple)
 - iii. Flowers with 3 distinct petals, (the upper 2 pink or pink purple petals usually free, the lower one forming a yellow keel and often fringed, the petals are usually joined to the stamens; 5 distinct sepals, the 2 inner ones larger and often petaloid (the 3 outer sepals are usually green and the other inner ones are petal-like), flowers in racemes, several-flowered; milky stems; thorny Polygalaceae (Milkwort) Polygala subspinosa
 - iv. Flowers with 5 petals, 5 sepals -
 - a. 5 petals, 5 sepals, Flowers small, typically pink, tubular united petals, leaves appear clustered some Boraginaceae (Borage): *Tiquilia* (others in herbs)

CACTUS

1. No leaves; spines, numerous petals, sepals and stamens; showy; red, pink, purple, or yellow – **Cactaceae (Cactus)**

SPOROPHYTES (Spore-bearing)

1. Stems typically hollow, jointed, ribbed longitudinally; leaves whorled, small, scalelike, microphyllous – Equisetaceae (Horsetail)

2. Plants with scaly or hairy, creeping rhizomes; leaves coiled in the bud forming fiddleheads, leaves simple or compound, often hairy or scaly - **Polypodiaceae (Fern)**

PARASITIC HERBS LACKING CHLOROPHYLL

 Fleshy purplish, brownish, or yellowish white stems, leaves alternate, reduced and scalelike, 5 lobed united tubular purplish, reddish, or yellowish petals with an upper and lower lip, 5 lobed united sepals – Orobanchaceae (Broomrape)

GRASSES AND GRASS-LIKE HERBS (SOME OF THE MONOCOTS)

- Leaves alternate, simple, 2-ranked, stems round, often with hollow internodes, swollen nodes; flowers individually small and inconspicuous; no petals, no sepals, typically 3 stamens (rarely 2 or 6); each flower has 2 bracts forming a spikelet – Poaceae (Grass)
- 2. Leaves simple, linear, sometimes reduced to bladeless sheaths, stems can have edges (*Scirpus* has rounded stems); petals and sepals lacking or reduced to bristles; the spike of reduced flowers forms a spikelet;

grows in wet or moist soil – Cyperaceae (Sedge)

- Stems not jointed; leaves sheathing, alternate or all basal; flowers with 3 petals, 3 sepals, membranous, greenish or brownish; stamens 6 (rarely 3), 1 pistil Juncaceae (Rush)
- leaves mainly basal, linear, sheathing at the base; flowers terminal spike, 3 greenish petals, 3 greenish or purplish sepals, the sepals and petals not well differentiated; perianth of 3 + 3 tepals; stamens commonly 6, 1 pistil; *Triglochin maritima* - perianth greenish-yellow – Juncaginaceae (Arrowgrass)
- 5. leaves alternate, long, linear, flat, sheathing; flowers densely crowed in terminal spikelike inflorescences; perianth lacking (0 petals, 0 sepals), 2-5 stamens; unisexual, pistillate and staminate spikes look like a hot-dog-on-a-stick; fruits: achene or nutlet; semiaquatic or aquatic -**Typhaceae** (Cattail)

HERBS

- 1. Leaves whorled
 - A. Leaves simple
 - i. 4 lobed white to green petals marked with green dots, flowers solitary or in cymes, 4 lobed sepals, leaves in whorls of 4 some Gentianaceae (Gentian) Swertia albomarginata; (Centaurium in herbs, opposite, simple, 4 or 5 petals, 4 or 5 sepals)
 - ii. 4 lobed funnelform greenish-white or cream petals, 4-8 lobed sepals, minute or lacking Rubiaceae (Madder) Galium triflorum (others in subshrubs -whorled, simple, 4 petals)
 - iii. 5 to numerous (1/8" wide) pale greenish/white tubular partly united petals borne in clusters, 5 parted sepals, 5 stamens, reddish stems

- Apocynaceae (Dogbane) - Apocynum cannabinum

2. Leaves basal

A. Leaves simple, parallel veined, monocot

- i. Flowers with 3 to numerous petals, 3 sepals
 - a. 3 large white petals, 3 white or green sepals; petals in multiples on stalk with flowers orinented in a downward direction –
 Agavaceae (Agave)
 - b. Flowers with 3 to 8 small to medium white, pink, or purple petals oriented in an upward or outward direction, 3 sepals (commonly petaloid), small to medium white or pink flowers Liliaceae (Lily)
- B. Leaves simple, primarily basal in a rosette
 - i. Flowers appear to be a single flower, but are composed of several flowers; flowers can be yellow, white, purple, pink or greenish some **Asteraceae (Sunflower)**
 - ii. Flowers with 0 petals, 3 to 6 petaloid whitish sepals **Polygonaceae** (Buckwheat)– *Eriogonum gordonii*, *Eriogonum inflatum*, *Eriogonum wetherillii* (others in shrubs, subshrubs, and herbs-alternate, simple)
 - iii. Flowers with 2 to 5 petals, 4 or 5 sepals
 - a. Flowers with 2 to 5 yellow petals, 5 green sepals, leaves basal and alternate – Ranunculaceae – Buttercup – Ranunculus testiculatus
 - b. Flowers with 4 united tiny white petals, 4 united tubular sepals **Plantaginaceae (Plantain)**
 - c. Flowers with 5 united yellow lobed petals (upper pair shorter than the lower 3), 4 or 5 sepals, at least partially united, leaves basal and alternate Scrophulariaceae (Figwort) Verbascum thapsum (others in herbs (alternate, simple and opposite, simple)
 - d. Flowers with 5 lobed lavender to pink tubular petals with the corolla tube rimmed in yellow; 5 tubular lobed sepals Primulaceae (Primrose)
 - e. Flowers with 4 white small to medium petals (not papery), 4 sepals, leaves basal and alternate Brassicaceae (Mustard) Draba cuneifolia
 - iv. Flowers with 5 or more yellow petals, 5 sepals, leaves basal and alternate **Ranunculaceae Buttercup** *Ranunculus cymbalaria*
- C. Leaves compound
 - i. Flowers with 4 petals, 2 sepals
 - a. Yellow flowers with 4 petals, the 2 outer ones spreading at the apex, the 2 inner ones united– Fumariaceae (Bleedingheart)
 - ii. Flowers with 5 petals, 0-5 sepals, leaves basal
 - a. Pinkish, purple, leaves basal and opposite **Geraniaceae** (Geranium) (also listed in herbs- leaves opposite, compound)

- b. flowers with 5 petals; 5 sepals or lacking; petals can be yellow, white, or purple; petals and sepals are distinct; individual flowers are small and grouped in compound umbels; leaves basal (can have a few leaves alternate) and compound Apiaceae (Carrot)
- c. White or cream (less commonly pink or blue tinged) petals with spurs colored like the sepals, leaves basal and alternate **Ranunculaceae Buttercup** *Aquilega micrantha*
- 3. Leaves opposite
 - A. Leaves simple
 - i. Yellow flowers appear to be a single flower, but are composed of several flowers **Asteraceae (Sunflower)** *Flaveria, Thelesperma*
 - ii. Flowers with no petals
 - a. Flowers with 4-5 white, pink, or purple united tubular petaloid sepals Nyctaginaceae (Four O'Clock)
 - b. female (pistillate) flowers and male (staminate) flowers, 0 petals; 0 sepals; green, brown, white, or yellow Euphorbiaceae (Spurge) Euphorbia fendleri (other Euphorbiaceae in herbs, alternate, simple, no petals)
 - iii. Flowers with 4 or 5 united petals, 4 or 5 sepals
 - a. 4 or 5 united lobed white to pink or rose petals in cymes, flowers tubular expanding at end, 4 or 5 lobed sepals some Gentianaceae (Gentian) Centaurium; (Swertia albomargina in herbs, whorled, simple, 4 petals, 4 sepals)
 - iv. Flowers with 5 united petals, 5 sepals
 - a. Flowers yellow, white, green, or pink; petals and sepals are folded down; 5 erect, colored corona hoods on top –
 Asclepiadaceae (Milkweed)
 - b. Flowers blue, purple, or white Lamiaceae (Mint)–Hedeoma drummondii, Marrubium vulgare
 - c. Flowers with 5 united tubular white (or less often bluish or pink) petals; 5 lobed sepals, flowers in cymes some Polemoniaceae (Phlox) Phlox austromontana; (other members of this family in herbs, alternate, simple: *Gilia*; and subshrub, opposite, simple: *Leptodactylon* watsonii)
 - flowers red, yellow, or blue, united petals, 5 sepals, at least partially united Scrophulariaceae (Figwort) Mimulus, Penstemon (others in herbs (basal, simple and alternate, simple)
 - e. Flowers pale blue to purple, borne in long dense spikes; 5 lobed united tubular petals, regular or slightly 2-lipped; 5 toothed sepals, usually tubular - **Verbenaceae (Vervain)** - Verbena *bracteata*
 - v. Flowers with 5 to numerous petals, 5 sepals
 - a. 5 to numerous small (1/8" wide) pale greenish/white tubular partly united petals borne in clusters, 5 parted sepals, 5 stamens, reddish stems – Apocynaceae (Dogbane) - Apocynum cannabinum
 - b. 5 white or pink petals, 5 sepals, 4-10 stamens Caryophyllaceae (Pink)

- B. Leaves compound
 - i. Yellow flowers appear to be a single flower, but are composed of several flowers **Asteraceae (Sunflower)** *Bidens frondosa*
 - ii. Flowers with no petals, 4-5 white petaloid sepals Ranunculaceae (Buttercup) Clematis ligusticifolia
 - iii. Flowers with 5 petals, 5 sepals
 - a. Flowers pink Geraniaceae (Geranium) (also listed in herbs leaves basal, compound)
 - b. Flowers with 5 yellow petals; 5 sepals; plant lying flat on the ground, seeds with spines **Zygophyllaceae (Caltrop)** *Tribulus terrestris*
- 4. Leaves alternate
 - A. Leaves simple
 - i. Flowers appear to be a single flower, but are composed of several flowers; flowers can be yellow, white, purple, pink or greenish some **Asteraceae (Sunflower)**
 - ii. Flowers with no petals
 - a. 5 whitish green sepals which come to a point, lance-shaped leaves Santalaceae (Sandalwood)
 - b. 3 to 6 petaloid white, yellow, green, pink or red sepals, small. Some stems have swollen nodes, alternate/basal -Polygonaceae (Buckwheat) Eriogonum alatum (yellowish, green), Polygonum lapathifolium (green, white, or pink), Rumex hymenosepalus (pink), and Rumex venosus (red) (others in shrubs, subshrubs, and herbsbasal, simple)
 - c. leaves bluish, small, 2-5 green, yellow or brown sepals Chenopodiaceae (Goosefoot)
 - d. flowers in axillary clusters; 5 sepals; 3 conspicuous green or red to purple bracts -Amaranthaceae (Amaranth) – Amaranthus blitoides
 - e. female (pistillate) flowers and male (staminate) flowers, 0 petals; 0-8 sepals; green, brown, white, or yellow Euphorbiaceae (Spurge) most Euphorbiaceae (Euphorbia fendleri has opposite leaves)
 - iii. Flowers with 3 petals, 3 sepals
 - a. 3 brownish, purple, green or yellowish green petals (free or united, one petal differing from the other two in form, size, and coloration, often forming a lip or spur), 180 degree twist in the flower causing the upper petal to look like the lower one; 3 sepals; sepals either green and sepaloid or colored and petaloid; Leaves often sheathing, parallel veined; monocot Orchidaceae (Orchid)
 - iv. Flowers with 4 petals, 4 sepals
 - a. White, yellow, or pink small to medium petals (not papery) Brassicaceae (Mustard)
 - b. Flowers with 4 white, yellow, or pink large papery clawed petals, 4

sepals, lower leaves can be opposite or basal – **Onagraceae** (Evening-Primrose)

- v. Flowers with 4 or 5 united tubular red, green, or pink or purple petals; 4 or 5 sepals, at least partially united **Scrophulariaceae (Figwort)** *Castilleja, Cordylanthus wrightii*, (others in herbs (basal, simple and opposite, simple)
- vi. Flowers with 4-6 yellow petals (generally 5) open only in sunshine, soon close; 2 united sepals **Portulaceae (Purslane)** *Portulace oleracea*
- vii. Flowers with 5 united petals, 5 sepals
 - a. Flowers small yellow, pink, white, red, or purple. (Sometimes lower leaves opposite in *Cryptantha*) most **Boraginaceae (Borage)**: *Crytantha, Cynoglossum, Heliotropium, Lappula, Lithospermum* (*Tiquilia* in subshrubs)
 - b. Flowers purple, blue, or white, not papery; flowers grouped in Sshaped cymes, rarely solitary; the lower leaves sometimes opposite in *Phacelia* – Hydrophyllaceae (Waterleaf)
 - c. Flowers with 5 united tubular white to violet or yellowish funnelform petals (some are ill-scented and open in the evening); 5 lobed tubular sepals; large leaves- **Solanaceae (Potato)**
 - d. Flowers with 5 united funnelform white, blue, lavender, purple or rose petals, 5 separate sepals **Convolvulaceae (Morning Glory)**
 - f. Flowers with 5 united petals, 5 lobed sepals, flowers are funnelform, scarlet, lavender, blue, white, yellow, or pink some
 Polemoniaceae (Phlox) Gilia (others in herbs, opposite, simple: *Phlox*; and subshrub, opposite, simple: *Leptodactylon* watsonii)
 - g. Flowers with 5 united tubular yellow petals; 4 or 5 sepals, at least partially united – Scrophulariaceae (Figwort) – Linaria dalmatica (leaves alternate, simple); Verbascum thapsum (leaves basal and alternate) (others in herbs -basal, simple and opposite, simple)
- viii. Flowers with 5 distinct petals, 3 to 5 sepals
 - a. Flowers yellow or bluish-purple, flowers papery and short –lived,
 5 distinct sepals Linaceae (Flax)
 - b. Flowers with 5 orange or red petals, 3 to 5 sepals Malvaceae (Mallow)
 - c. 5 bluish-white tube-shaped partly united petals borne in terminal clusters, 5 parted sepals, 5 stamens Apocynaceae (Dogbane) Amsonia tomentosa
 - d. 5 distinct yellow petals, 4-5 sepals, petaloid stamens Loasaceae
 (Stickleaf) Mentzelia albicaulis (other species at Arches NP have 10 petals)
 - e. Flowers with 5 unequal petals, yellow, purple veined and commonly purple dorsally, the lowermost enlarged and spurred; 5 separate sepals, distinct or nearly so **Violaceae (Violet)** *Viola purpurea* var. *venosa*
- ix. Yellow flowers with 5-10 distinct petals, 5 sepals, numerous petaloid stamens Loasaceae (Stickleaf) *Mentzelia albicaulis*: 5 yellow petals;

Mentzelia multiflora: 10 yellow petals; the inner 5 somewhat shorter and narrower; *Mentzelia pterosperma*: 10 petals; *Mentzelia pumila*: 10 petals;

- B. Leaves compound
 - i. Flowers with 4 petals, 2 to 5 sepals
 - a. Flowers with 2 unlike sets of 2 purple or blue petals, 5 purple petaloid sepals **Ranunculaceae (Buttercup)** *Delphinium* (Larkspur)
 - b. Flowers with 4 yellow petals, 2 sepals Fumariaceae (Fumitory)
 - c. Flowers with 4 yellow petals, 4 sepals Capparaceae (Caper)
 - d. Flowers with 4 white, cream or yellow petals, 4 sepals **Brassicaceae** (Mustard)– some *Descurainia*, and *Nasturtium officinale*
 - ii. Flowers with 5 petals, 5 sepals
 - a. 5 blue, purple, pink, white, yellow or inconspicuous petals distinct or lower 2 united, sepals united – Fabaceae (Pea) – except Parryella and Robinia