Marah macrocarpa (Greene) Greene, LARGE-FRUITED MAN-ROOT. Perennial herb, geophytic vine from a huge, deep-seated tuber, with tendrils, several–many-stemmed at base, often with unequally forked axes at each node, trailing and climbing with principal axes radiating 100–500 cm from tuber crown; monoecious (occasionally only staminate or appearing so); shoots villous to sparsely villous sometimes becoming nearly glabrate, hairs mostly multicellular and wavy or short-arching, the shorter hairs with persistent, domelike bases; tendril 1 per node, arising adjacent the petiole base, thick, ridged, unequally 2–3-branched 15–50 mm above base, often strongly coiled, the longest branch 150–200(–350) mm long when straightened and other branches successively shorter; tuber upright, to 100 cm tall and weighing as much as 100 kg, with potatolike flesh, forming suds when beaten in water (sapogenic). **Stems:** conspicuously ridged, 4–8 mm diameter, the ridges ± 10, rounded and descending from leaf bases, tough and flexible, green-striped with paler ridges, internodes often long, with soft hairs but mostly lacking domed bases. **Leaves:** helically alternate, palmately lobed, petiolate, without stipules; petiole ridged, to 55 mm long, flexible, with scattered hairs mostly in furrows; blade flat and horizontally oriented, roundish to kidney-shaped to heart-shaped in outline, 50–150 × 50–170 mm, > petiole, 5-lobed, 7-lobed, or 9-lobed; the central lobe > lateral lobes, dissected at midpoint to 1/3 length of blade (from top of petiole to tip of leaf) and typically 25–50 mm wide (rare individuals in a population may have lobes < 15 mm wide and cut 3/4 length of blade), the lateral lobes shorter (lower ones sometimes little more than angles or broad teeth) with basal pair forming a cordate to earlike (truncate) blade base, lobes typically with at least a few unequal, broad to shallow teeth on margins, palmately veined with 5 principal veins and the 2 to basal lobes often branched, principal veins strongly raised on lower surface, upper surface becoming somewhat scabrous from persistent domed hair bases, lower surface veins bearing arched hairs. **Inflorescences:** raceme or panicle of racemes of staminate flowers and solitary flower (pistillate) or with pistillate flower as the lowest flower of an otherwise staminate raceme, axillary, raceme or panicle 85–195 mm long, 10–50-flowered, flowers sweetly fragrant, tomentose in bud, lacking bracts; peduncle 20–75 mm long; principal axes low-ridged, green with whitish pubescence; pedicel typically cylindric, 2–16 mm long (staminate) and 10–30 mm long increasing in fruit (pistillate). **Staminate flower:** radial, in range 10–17(–24) mm across, shallowly to deeply cup-shaped and appearing superior because ovary lacking, after pollination abscising from end of petiole; hypanthium cup-shaped, 3–5 mm diameter, 1–3.5 mm deep, green, ± 10-veined below midpoint, with veins generally forked below corolla lobes, externally pubescent, internally with conspicuous, colorless glandular hairs; **sepals** 0(4–6), if present diminutive between corolla lobes, narrowly triangular to lanceolate, < 1 mm long, pale green; **corolla** (4–)5(–6)-lobed, star-shaped (sometimes 1 lobe slightly larger and commonly 2-toothed at tip), continuous with hypanthium but white, lower surface soft-pubescent, upper surface with glandular hairs; **stamens** 3(–4), fused into stout column and to base of corolla; filaments 1–2 mm diameter, ± 0.8 mm wide at base, tapered to rounded at tip; anthers ± fused into barrel-shaped cluster 1–1.5 × 1–1.3 mm, 1 anther ± distinct, other 2(3) anthers indistinct and ± continuous across tip, each anther sigmoidal with vertically elongate loops light yellow on green sterile tissue; pollen light yellow. **Pistillate flower:** to 34 mm diameter, ≥ staminate flowers from the same axil; hypanthium funnel-shaped, the cylindric base fused to style 2.5–3 mm, the expanded cup as in

staminate flower but with scattered glandular hairs on lower surface and 3 or 5 short-deltate or blunt processes (= aborted stamens) subtending stigma; **sepals** (0)5–6, acute to acuminate, 0.5–1.5 mm long, pale green; **corolla** (4–)5(–6)-lobed, star-shaped (sometimes 1 lobe slightly larger and commonly 2-toothed at tip); lobes to 17 mm long and > staminate flower, continuous with hypanthium but white, lower surface soft pubescent, upper surface with glandular hairs; **pistil** 1; ovary conspicuously inferior, ovoid to spheric, at anthesis 5–7 mm wide, covered with ascending, light green prickles and soft glandular and nonglandular hairs on ovary body, 4-chambered, each chamber with several ovules attached to peripheral wall; style thick, 2.5–3 mm long; stigma massive and filling corolla throat, hemispheric, 3–4 mm diameter, yellowish green to dark green. **Fruit:** pepo (berry with a stiff outer shell), pendent, dehiscent and splitting regularly or irregularly by 4 valves at tip (caused by high nighttime water pressure) thereby ejecting up to 4 seeds from each chamber; fruit body ovoid to oblong, 50–100 × 50–55 mm + dense, stiff prickles, rounded or beaked at tip, green before splitting later drying light brown and becoming like stiff paper; prickles persistent on dry fruit skeleton, straight to curved, to 20 mm long; watery pulp of immature fruit sapogenic. **Seed:** ellipsoid to compressed-subspheric, 13–18 × 11–13 × ca. 10 mm, brown, with an encircling suture line from a slightly raised hilum; hilum linear, ± 3 mm long, whitish tan. Mid-November–early May.

Native. Trailing and climbing perennial herb very common in range, occurring in all shrub communities and margins and gaps of woodlands. *Marah macrocarpa* has strongly coiled, three-branched tendrils, and therefore is generally not confused with the introduced stem twiner German ivy (*Delairea odorata*), which has similar leaves, or the twining native *Calystegia macrostegia*, which has triangular leaves. It also cannot be mistaken for grape species (*Vitis*), which are woody climbers that have coiled, two-branched tendrils. After chaparral or coastal sage scrub has burned, early the next spring *Marah* often covers large patches of bare ground as its vigorous shoots grow rapidly from the massive tuber, and after fire such plants flower profusely. Soon after the first winter rains, shoots emerge; staminate inflorescences are produced at successive nodes for at least several weeks before the first pistillate flower appears with the staminate inflorescence at new nodes. In a given year, many individuals never form pistillate flowers. The large, prickly fruits are explosively discharge their seeds via turgor pressure supplied by the tuber. During any springtime, many plants never form fruits, and during certain years fruit set can be virtually absent throughout the entire range, for a reason not yet understood. If recognized, our populations would be variety *macrocarpa*.
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