Marsilea vestita Hooker & Grev., HAIRY PEPPERWORT. Perennial herb (aquatic or terrestrial), clonal, rhizomatous, fibrous-rooted at nodes, rosetted with acaulous plantlets along horizontal rhizomes, aquatic form with floating leaves (not observed), land form with ascending leaves to 16 cm tall; shoot rosettes with 1–several leaves at each node along rhizome, blades exhibiting sleep movements, very young leaves arising from folded and indistinctly coiled fiddleheads, shoots in range soft-hairy but especially densely stiff-hairy at nodes; rhizomes creeping, congested (mother plant) but often with aboveground, slender, unbranched, stolonlike extensions, cylindric, to 1 mm diameter, internodes of stolonlike rhizome to 20 mm long and sparsely hairy. **Leaves (fronds):** helically alternate, pinnately compound and 4-foliolate (appearing palmately compound) of 2 opposite pairs of leaflets and having a very short rachis, long-petiolate; petiole (stipe) of land leaves cylindric, (13–)25–150+ × to 0.7 mm, tough, ± villous, hairy at expanded top; rachis to 0.5 mm long; petiolules to 1 mm long, pulvinuslike; blades of leaflets fan-shaped, in range (3–)5–17 × (2–)4–13 mm, thin, triangular-tapered at base, entire, rounded at tip and often reddish along edge, finely ± dichotomously veined with some cross veins, villous with mostly appressed hairs. **Sporocarp (sporangium case):** containing elongate sori of male and female sporangia, attached on stiff stalk at base of each moderate-sized leaf just above mud level; stalk ascending, unbranched, ± 5 mm long + ridge (raphe) attached 1.1–1.7 mm to sporocarp, stalk and raphe orangish, stalk with scattered hairs, at base of raphe having a short tooth (proximal tooth), at top of raphe having a larger, red to purplish tooth (distal tooth) 0.4–1.2 mm long and often hooked; sporocarp horizontally oriented, nutlike, hard-walled and appearing indehiscent but eventually in water dehiscent along upper edge (“germinating”) to permit water-requiring sexual reproduction, compressed-ellipsoid or slightly ovoid, in range 6–7.8 × 4–5.3 × 3–3.5 mm, brown to dark brown with minute rims (scars of hairs), initially densely hirsute with mostly appressed hairs and coherent to wall, the hairs flattened and mostly oriented from top edge to bottom edge, white or aging brownish; sporocarp remaining indehiscent and viable for years, becoming glabrescent as hairs shed. **Sori:** narrowly elongate parallel to veins of sporocarp, in gelatinous matrix protruding from sporocarp, having numerous female sporangia attached along ridge and smaller male sporangia along flanks; **male sporangia** (microsporangia) with many smaller spores; **female sporangia** (megasporangium) 1-spored. Springtime (sexual reproduction in water of sporocarps from previous years).

Native. Perennial herb known only from an ephemeral pond in Day Canyon (SH) growing from exposed mud in drying pond. *Marsilea vestita* is an aquatic fern that forms floating leaves when established in shallow water but ascending leaves on plants growing on land. The blade of this fern resembles the dicotyledons *Oxalis* and *Trifolium*, i.e., cloverlike, but instead the fern has four leaflets; its quadrifoliolate leaves technically are pinnately compound because they form a short rachis, but this leaf appears palmately compound. The leaflets exhibit sleep movements, as in the lookalike dicotyledons. Attached to the petiole base of any large leaf is a nutlike sporocarp, a highly modified, fruitlike structure that encloses the sori. Where nodes are close together, the sporocarps appear to be clustered, whereas on the stolonlike shoots commonly only one sporocarp occurs per node. A sorus has male sporangia, and eventually male gametophytes producing sperm, and numerous, larger female sporangia. Each female sporangium produces only one large spore (megaspore) that forms a female gametophyte, including an egg. The sporocarps are

clearly visible just above the soil (mud), and after plants die back, the nutlike structures sink into the wet mud, where they can persist for years before the hard wall is softened or damaged enough to split open, when wetted, to permit sexual reproduction.
B. A. Prigge & A. C. Gibson