

underlying serpentine rock (CDMG 1991; CDC 2000). The soils may, therefore, in fact be derived from such rock or include pockets of soil derived from such rock, or the amount of serpentine rock may be too small to be mapped (E. Russell, NRCS, pers. comm., 2002). Available geologic maps fail to show any serpentine rock in the vicinity of the type locality White River population (CDMG 1992; Jennings 1977; CDC 2000), but instead show that the area contains Cibo clays. However, Cibo soils have an intrinsic tendency to dry out, harden, and form deep cracks during the summer which can discourage the growth of some plants (E. Russell, pers. comm., 2002). Hence, these soils would limit vegetation competition in favor of *S. keckii*.

Based on available soils and geologic maps, the Coarsegold soils of the Mine Hill population do not overlie serpentine rock, nor are they intrinsically restrictive to plant growth (CDMG 1991; Jennings 1977; SCS 1982; CDC 2000; E. Russell, pers. comm., 2002). The botanists who discovered the population, however, characterized the site as a “serpentine rock outcrop” (Kirkpatrick 1992). Although geologic maps do not list serpentine rock at the site itself, they do show it within a mile to the northeast and southwest (CDMG 1991; Jennings 1977; CDC 2000). The site itself sits over “precenozoic metasedimentary and metavolcanic rocks of great variety” (Jennings 1977). Hence, it appears likely that the site consists of a pocket habitat of serpentine soil which was too small to be mapped (E. Russell, pers. comm., 2002). SCS soil maps tend to list only the dominant soil type in an area. Other such pocket

habitats may exist within the same combination of soil and underlying rock.

Mapping

We delineated the critical habitat units by creating data layers in a GIS format. First, we identified the locations of the *Sidalcea keckii* populations using information from the CNDDDB (2001) and published and unpublished documents from those who located the known populations (Kirkpatrick 1992; Stebbins 1992). In the case of the Piedra population, where *S. keckii* grew in more than one patch, we identified the locations and approximate dimensions of the various patches as well, based on information provided by SFC (C. Peck, *in litt.*, 2002). We mapped populations or patch locations from all sites on USGS 7.5<sup>1</sup> quadrangle topological maps (USGS 1990) to obtain information on elevation, slope, and recognizable surface features. We then used soil survey maps (NRCS 2001) to restrict potential critical habitat to the boundaries of the basic soil types on which the populations grow. In areas where the presence of *S. keckii* could not be explained by the properties of the mapped soil type alone (such as the Coarsegold soils at the Mine Hill location), we mapped critical habitat boundaries to the same underlying rock type as at the population site (CDC 2000). We then used recent aerial photos (SPOT 2001), topological maps (USGS 1990), and discussions with experts familiar with the areas (R. Faubion, U.S. Bureau of Reclamation (BOR), pers. comm., 2002; C. Peck, pers. comm., 2002) to eliminate large contiguous areas which were noticeably

more overgrown or which were not grassland and, therefore, not suitable habitat for the species.

In order to provide determinable legal descriptions of the critical habitat boundaries, we then used an overlaid 100-meter grid to establish UTM North American Datum of 1983 (NAD 83) coordinates which, when connected, provided the critical habitat unit boundaries. We include the legal description derived from the UTM coordinates for each unit in the Regulation Promulgation section, below.

In designating critical habitat, we made an effort to avoid developed areas, such as housing developments and agricultural fields, that are unlikely to contribute to the conservation of *Sidalcea keckii*. However, we did not map critical habitat in sufficient detail to exclude all developed areas, or other lands unlikely to contain the primary constituent elements essential for the conservation of *S. keckii*. Areas within the boundaries of the mapped units, such as buildings, roads, and paved areas will not contain one or more of the primary constituent elements. Federal actions limited to these areas, therefore, would not trigger a section 7 of the Act consultation, unless they affect the species or primary constituent elements in adjacent critical habitat.

Critical Habitat Designation

Lands designated as critical habitat are under private and Federal jurisdiction and include one or more of the primary constituent elements described above. The approximate areas of critical habitat by land ownership are shown in Table 1.

TABLE 1.—APPROXIMATE AREAS IN HECTARES (HA) AND ACRES (AC) OF CRITICAL HABITAT FOR *Sidalcea keckii* BY LAND OWNERSHIP

Unit	Federal	Private	Total
1. Piedra .....	3 ha (7 ac) .....	203 ha (503 ac) .....	206 ha (510 ac)
2. Mine Hill .....	0 .....	86 ha (213 ac) .....	86 ha (213 ac)
3. White River .....	0 .....	146 ha (362 ac) .....	146 ha (362 ac)
Totals .....	3 ha (7 ac) .....	435 ha (1,078 ac) .....	438 ha (1,085 ac)

The three critical habitat units include the only two locations where *Sidalcea keckii* has been observed since the 1930s and the type locality. This later site may still be occupied by a seed bank, and is the most appropriate location to consider for reestablishment efforts. A brief description of each critical habitat unit is given below:

Unit 1: Piedra

Unit 1 is on the western slopes of Tivy Mountain in the Piedra area of southern Fresno County. It contains 206 ha (510 ac), of which 203 ha (503 ac) are privately owned and 3 ha (7 ac) are managed by the BOR (R. Faubion, pers. comm., 2002). Of the privately owned land, 77 ha (189 ac) of proposed critical habitat is on the Tivy Mountain Reserve which is owned by SFC and established

for the conservation of *Sidalcea keckii* and other rare plants. SFC uses managed grazing as a tool to reduce competing non-native grasses from *S. keckii* sites, and monitors the plant as well (SFC 2001). Another 6.5 ha (16 ac) of this unit occurs on a conservation easement held by SFC on privately owned land adjacent to the reserve.

Recent surveys of the areas containing documented populations of *Sidalcea keckii* were conducted in 1998, 2000,