

individuals for the area to be considered occupied because plants may still exist at the site as part of the seed bank (Given 1994). All occupied sites contain some or all of the primary constituent elements and are essential to the conservation of the species, as described below.

Each of the critical habitat units likely includes areas that are unoccupied by *Sidalcea keckii*. "Unoccupied" is defined here as an area that contains no above-ground *S. keckii* plants and that is unlikely to contain a viable seed bank. Determining the specific areas that this taxon occupies is difficult because, depending on the climate and the natural variations in habitat conditions, the extent of the distributions may either shrink and disappear, or if there is a residual seed bank present, enlarge and cover a more extensive area. Because it is logistically difficult to determine how extensive the seed bank is at any particular site, and because above-ground plants may or may not be present in all patches within a site every year, we cannot quantify in any meaningful way what proportion of each critical habitat unit may actually be occupied by *S. keckii*. Therefore, patches of unoccupied habitat are probably interspersed with patches of occupied habitat in each unit. The inclusion of unoccupied habitat in our critical habitat units reflects the dynamic nature of the habitat and the life history characteristics of this taxon. Unoccupied areas provide areas into which populations might expand, provide connectivity or linkage between colonies within a unit, and support populations of pollinators and seed dispersal organisms. Both occupied and unoccupied areas that are proposed as critical habitat are essential to the conservation of the species.

Primary Constituent Elements

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, we consider those physical and biological features (primary constituent elements) that are essential to the conservation of the species and that may require special management considerations or protection. These include, but are not limited to: space for individual and population growth and for normal behavior; food, water, air, light, minerals or other nutritional or physiological requirements; cover or shelter; sites for germination or seed dispersal; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

Much of what is known about the specific physical and biological requirements of *Sidalcea keckii* is described in the Background section of this final rule. The designated critical habitat is designed to provide sufficient habitat to maintain self-sustaining populations of *S. keckii* throughout its range and allow for the expansion of populations in order to help reach the primary goal of conservation, and to provide those habitat components essential for the conservation of the species. These habitat components provide for: (1) individual and population growth, including sites for germination, pollination, reproduction, pollen and seed dispersal, and seed dormancy; (2) areas that allow gene flow and provide connectivity or linkage within larger populations; (3) areas that provide basic requirements for growth, such as water, light, and minerals; and (4) areas that support populations of pollinators and seed dispersal organisms.

We believe the long-term conservation of *Sidalcea keckii* is dependent upon the protection of existing population sites and the maintenance of ecological functions within these sites, including connectivity between colonies (*i.e.*, groups of plants within sites) within close geographic proximity to facilitate pollinator activity and seed dispersal. The areas we are designating as critical habitat provide some or all of the habitat components essential for the conservation of *S. keckii*. Based on the best available information at this time, the primary constituent elements of critical habitat for *S. keckii* are:

- (1) Minimally shaded annual grasslands in the foothills of the Sierra Nevada Mountains containing open patches in which competing vegetation is relatively sparse; and
- (2) Serpentine soils or other soils that tend to restrict competing vegetation.

Criteria Used to Identify Critical Habitat

We identified critical habitat areas essential to the conservation of *Sidalcea keckii* in the three primary locations where it currently occurs or has been known to occur: the Piedra area of Fresno County, the Mine Hill area of Tulare County, and near White River in Tulare County. We are designating sufficient critical habitat at each site to maintain self-sustaining populations of *S. keckii* at each of these locations.

During the development of this rule, we considered the role of unoccupied habitat in the conservation of *Sidalcea keckii*. Due to the historic loss of the habitat that supports this species, we believe that future conservation and

recovery of this taxon depends not only on protecting it in the limited area that it currently occupies, but also on providing the opportunity to expand its distribution by protecting currently unoccupied habitat that contains the necessary primary constituent elements within its historic range.

To help achieve our goal of conservation of *Sidalcea keckii*, we are including the White River site, despite the fact that *S. keckii* has not been documented there in recent years. The White River population is the type location where the plant was originally discovered and described from and still is documented to contain the primary constituent elements that would support the species. It is one of the extremely few locations where *S. keckii* has ever been observed and may be occupied by a seed bank. We have evidence from the Piedra site, where *S. keckii* was undocumented from 1939 until its rediscovery in 1998 (Cypher 1998; CNDDDB 2001), that such rediscoveries are possible for *S. keckii*. The Piedra site supports the largest known *S. keckii* population, with 500 to 1,000 plants when last surveyed (Cypher 1998). Even if the species is not rediscovered at the White River site, we still believe the site is essential to the conservation of the species because it is the most appropriate site for a reestablishment effort. The combination of limited range, few populations, and restricted habitat makes *S. keckii* susceptible to extinction or extirpation due to random events, such as fire, disease, or other occurrences (Shaffer 1981, 1987; Primack 1993; Meffe and Carroll 1994). Such events are a concern when the number of populations or geographic distribution of a species are severely limited, as is the case with *S. keckii*. Establishment of a third location for *S. keckii* is likely to prove important in reducing the risk of extinction due to such catastrophic events.

Despite the association of *Sidalcea keckii* with serpentine soils (Kirkpatrick 1992; Cypher 1998), only a portion of *S. keckii* plants at the Piedra site grow on soil identified by SCS maps as being serpentine derived (the soil, Fancher extremely stony loam) (SCS 1971; NRCS 2001). Other patches at Piedra grow on what SCS maps indicate are Cibo clays, while the Mine Hill population of *S. keckii* grows in an area mapped as Coarsegold rock outcrop complex (NRCS 2001). Neither of these latter two soil types normally derive from serpentine rock (SCS 1971, 1982), although the underlying geology may contain it. Geologic maps, for example, show the Cibo soils of the Piedra population straddling an arm of