

Establishment of a second location for *D. bakeri* is important in reducing the risk of extinction of the species due to such catastrophic events. Further, when considering establishment of new locations as part of meeting the conservation needs of a species, we believe it is appropriate to look first to reestablishing populations within the historic range of a species, especially specific areas where the species was once known to occur, rather than going to completely new areas. Our designation of critical habitat does not include the location near Tomales, California, however, because our information is too vague to accurately identify the site.

We identified critical habitat for *Delphinium bakeri* by mapping the distribution of the known occurrences of the species with respect to distance from the coast, location within watersheds, soil series associations, aspect of the slopes and watersheds, position on slopes, our field observations of the soil conditions at each location, and our field observations of the plant associations found in the area of each location. We then drew an initial critical habitat demarcation that included the appropriate soils, vegetation, and watershed, consistent with our understanding of the physical and biological features and primary constituent elements that are essential for the conservation of this species. We mapped the critical habitat units to include the upslope and downslope areas that would be important to the maintenance of these features and related primary constituent elements essential for the conservation of the species.

We identified areas with features essential to the conservation of *Delphinium luteum* in the locations where it is known to occur in Marin and Sonoma counties. Due to the limited number of populations of *D. luteum* and the high degree of threat from catastrophic events, we have determined that all areas with recently documented occurrences contain physical and biological features that are essential for the conservation of this species and are necessary and appropriate to designate as critical habitat. All four *D. luteum* units (L1, L2, L3, and L4) are within the geographical area currently occupied by the species, and *D. luteum* occurs in all four of the units. In addition, the Center for Plant Conservation (2002) recommends that additional populations be established and managed for this species. Some locations within these critical habitat units may be suitable sites for such

introductions or for natural expansion of the existing populations.

As a rule, we drew boundary lines for *Delphinium luteum* critical habitat units to include all areas of the same soil type and in the same canyon system as the enclosed population(s). Although all but one recently documented population of *D. luteum* occurs on basically north-facing slopes, we consistently included as critical habitat both sides of the canyons which contain *D. luteum*. We did this because the folds and side canyons common to these sites can produce localized north aspect areas even on generally south aspect canyon walls, the species is not restricted to north-facing slopes, and south aspect slopes may support any of the other three primary constituent elements for this species. We did not extend critical habitat boundaries to deliberately include south aspect slopes unless they supported at least one of the other three primary constituent elements, although mapping limitations may have resulted in including a few such areas inadvertently. Including both sides of the canyons where the plant occurs also encompasses a wider range of microhabitats to support population growth. This approach also may have the benefit of making management of the units easier.

Units L1, L2, and L4 contain features which caused us to modify somewhat our general rule of drawing boundaries based on the same soil type and canyon system as the known population. In Unit L3, the soil boundaries conformed well to the canyon boundaries, and also included areas of steep-sloped canyon walls, so no modification of what was drawn (based on application of the general rule described above) was appropriate or necessary. Unit L1 soil boundaries included several branching canyons with numerous coastal drainage outlets, so we included those canyons which drained roughly to the same location and did not include the others. In Unit L2, the soil boundaries conformed well to the drainage, but because the area enclosed was very small and unbranched, and because the same soil type also occurred with suitable habitat in a separate drainage less than half a mile away, we extended the boundaries of the unit to include the north-facing slopes of the second drainage as bounded by the suitable soil type. The resulting unit is still the smallest of the four designated for *Delphinium luteum*, and by including this small area of nearby habitat, we can provide the resident *D. luteum* population an opportunity to colonize a new area. Given the susceptibility of *D.*

luteum populations to extirpation by random, uncontrollable events, the establishment of new populations is essential to the continuing survival of the species.

Unit L4 contains the population growing in a road-cut away from steep-sloped canyon walls, as well as the population mapped on a south-facing slope. It also includes a third population which is located in typical habitat, but which the CNDDDB lists as "possibly extirpated" due to the inability of several surveys to relocate it since 1982. All three populations are mapped as growing on different soil types (CNDDDB 2001). However, with two exceptions, all soil types in the area share the rapid run-off and high erosion potential with which *Delphinium luteum* is associated. The two exceptions are the canyon floor and a small area at the head of the canyon where the walls are not steeply sloped. We are including these for contiguity of the unit and because both of them about the location of the population located in the road cut. Taken together, the various soil types conform well to the main canyon boundaries (SCS 1985) and include all the habitat requirements of the species. Therefore, we have drawn Unit L4 largely according to the soil boundaries as they extend down the main canyon. We did not extend the unit up either of two large side canyons because those areas neither contain *D. luteum* populations nor a soil type common to all the populations in the unit.

Special Management Considerations

Special management considerations or protections may be needed to maintain the physical and biological features and primary constituent elements that are essential for the conservation of *Delphinium bakeri* and *D. luteum* within the units being designated as critical habitat. In some cases, protection of existing habitat and current ecological processes may be sufficient to ensure that populations of the plants are maintained at those sites and have the ability to reproduce and disperse in surrounding habitat. In other cases, however, active management may be needed to maintain the primary constituent elements for the two species.

As noted in the Critical Habitat section, "special management considerations or protection" is a term that originates in the definition of critical habitat. We believe the designated critical habitat units may require special management considerations or protection because remaining populations of *Delphinium bakeri* and *D. luteum* are extremely rare,