

California tiger salamander (Fisher and Shaffer 1996).

Stockponds may also facilitate spread of nonnative organisms by providing aquatic habitats in arid landscapes that otherwise may have served as barriers to the spread of such organisms. Despite these adverse impacts, the long-term effect of ranching on the species is either neutral or beneficial, because the California tiger salamander would have likely been extirpated from many areas if stockponds had not been built and maintained for livestock production.

Distinct Vertebrate Population Segment

Under the Act, we must consider for listing any species, subspecies, or, for vertebrates, DPSs of these taxa, if information is sufficient to indicate that such action may be warranted. To implement the measures prescribed by the Act and its Congressional guidance, we, along with the National Oceanic and Atmospheric Administration (NOAA) Fisheries, developed policy that addresses the recognition of DPSs for potential listing actions (61 FR 4722; February 7, 1996). The policy allows for a more refined application of the Act that better reflects the biological needs of the taxon being considered, and avoids the inclusion of entities that do not require its protective measures. Under our DPS policy, we use two elements to assess whether a population segment under consideration for listing may be recognized as a DPS. The elements are: (1) the population segment's discreteness from the remainder of the species to which it belongs; and (2) the significance of the population segment to the species to which it belongs. If we determine that a population segment being considered for listing is a DPS, then we evaluate the level of threat to that population segment on the basis of the five listing factors established by the Act to determine if listing it as either threatened or endangered is warranted.

Discreteness

The DPS policy's standard for discreteness is meant to allow an entity given DPS status under the Act to be adequately defined and described. A population segment of a vertebrate species may be considered discrete if it satisfies either one of the following two conditions: (1) it is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation; or (2) it is delimited by international governmental boundaries within which

significant differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist.

Dr. H. Bradley Shaffer has analyzed the population genetics of the California tiger salamander (Shaffer *et al* 1993; Shaffer and Trenham 2002). The most recently available and most comprehensive mtDNA sequence data indicate that there are six populations of California tiger salamander; these six populations are distinguished from one another by their mtDNA characteristics (Shaffer and Trenham 2002). We based our DPS determinations for the already-listed Sonoma County and Santa Barbara County populations of the California tiger salamander in part on the relatively high divergence of these populations from other populations of California tiger salamanders (65 FR 57242; 68 FR 13498). The phylogenetic tree (which indicates relationships among populations or groups) constructed from the mtDNA data of Shaffer and Trenham (2002) indicates that Sonoma County and Santa Barbara County California tiger salamanders are very distinct relative to other California tiger salamanders. They are separated from other California tiger salamanders on branches that are statistically strongly supported. These data indicate that Sonoma County and Santa Barbara County California tiger salamanders are distinct from other populations of the species. The genetic differentiation observed indicates that there has been little, if any, gene flow for a significant period of time between the Sonoma County population, the Santa Barbara County population, and the remaining populations, which are the subject of this rulemaking process.

Shaffer and Trenham's (2002) study may suggest that the Central California tiger salamander consists of four populations, which are found in the Bay Area, Central Valley, southern San Joaquin Valley, and the Central Coast Range. Their genetic study suggests that levels of interchange among these populations are low, and that populations or groups of populations (metapopulations) are genetically different from one another (Shaffer and Trenham 2002). However, the geographic boundaries between some of these populations have not been fully delineated (e.g., Bay Area and Central Coast Range populations in the vicinity of the Contra Costa County/Alameda County lines, and the border between the Central Coast Range/Central Valley populations). Therefore, we believe it is not appropriate at this time to treat each of these four populations as a separate DPS. Instead, we treat these four

populations as a single group, which is genetically and geographically distinct from the Sonoma County and Santa Barbara County groups.

The Central California tiger salamander is geographically isolated and separate from the Sonoma County DPS and the Santa Barbara County DPS, which are federally listed. The Sonoma County population is separated geographically from the closest Central California tiger salamander populations located in Contra Costa, Yolo, and Solano Counties by the Coast Range, Napa River, and the Carquinez Straits, a distance of about 72 km (45 mi). There are no known records of the California tiger salamander in the intervening areas (D. Warenycia, CDFG, pers. comm. 2002). The Santa Barbara County population is geographically separated from the Central California tiger salamander by the La Panza and Sierra Madre Ranges, and the Carrizo Plain, which extends into the Tremblor Range in eastern San Luis Obispo and western Kern Counties (Shaffer *et al.* 1993). Thus, the same conditions that establish geographic isolation of the Santa Barbara County California tiger salamander and the Sonoma County California tiger salamander from the Central California tiger salamander work correlatively to establish that the converse is also true. There is no evidence of natural interchange of individuals between the Sonoma County and Santa Barbara County populations with the Central California tiger salamander. The genetic work discussed above (Shaffer and Trenham 2002) also indicates that natural interchange is unlikely. Therefore, the best available genetic data (Shaffer and Trenham 2002) for California tiger salamanders indicate that the Central California tiger salamander is distinct from the Sonoma County and Santa Barbara County DPSs.

Significance

Under our DPS policy, once we have determined that a population segment is discrete, we consider its biological and ecological significance to the larger taxon to which it belongs. This consideration may include, but is not limited to, evidence of the persistence of the discrete population segment in an ecological setting that is unique for the taxon; evidence that loss of the population segment would result in a significant gap in the range of the species; evidence that the population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range; and evidence that the