CALIFORNIA GLOSSY SNAKE

Arizona elegans occidentalis Blanchard 1924

Status Summary

Arizona elegans occidentalis is a Priority 1 Species of Special Concern, receiving a Total Score/Total Possible of 67% (74/110). It was not on the list of candidates considered for Species of Special Concern designation during the previous evaluation (Jennings and Hayes 1994a).

Identification

Arizona elegans occidentalis is a medium-sized colubrid (64–99 cm SVL) with tan or brown dorsal coloration. It has dark-brown blotches edged in black running down the back and a series of similar, though smaller, blotches running down the sides (Klauber 1946, Stebbins 2003, Lemm 2006). The dorsal coloration is often lighter middorsally and darkens to a deeper brown on the sides. The lateral blotching sometimes touches the edges of the ventral belly scales, but otherwise the underside is unmarked (Klauber 1946). Scales are unkeeled, smooth and glossy, and only one pair of prefrontals are present (Stebbins 2003). A dark stripe runs from the corner of the mouth to the eye on each side of the face, and a third stripe connects the eyes across the posterior edge of the prefrontals (Blanchard 1924). An additional

California Glossy Snake: Risk Factors

Ranking Criteria (Maximum Score)	Score
i. Range size (10)	5
ii. Distribution trend (25)	25
iii. Population concentration/ migration (10)	0
iv. Endemism (10)	3
v. Ecological tolerance (10)	3
vi. Population trend (25)	25
vii. Vulnerability to climate change (10)	3
viii. Projected impacts (10)	10
Total Score	74
Total Possible	110
Total Score/Total Possible	0.67

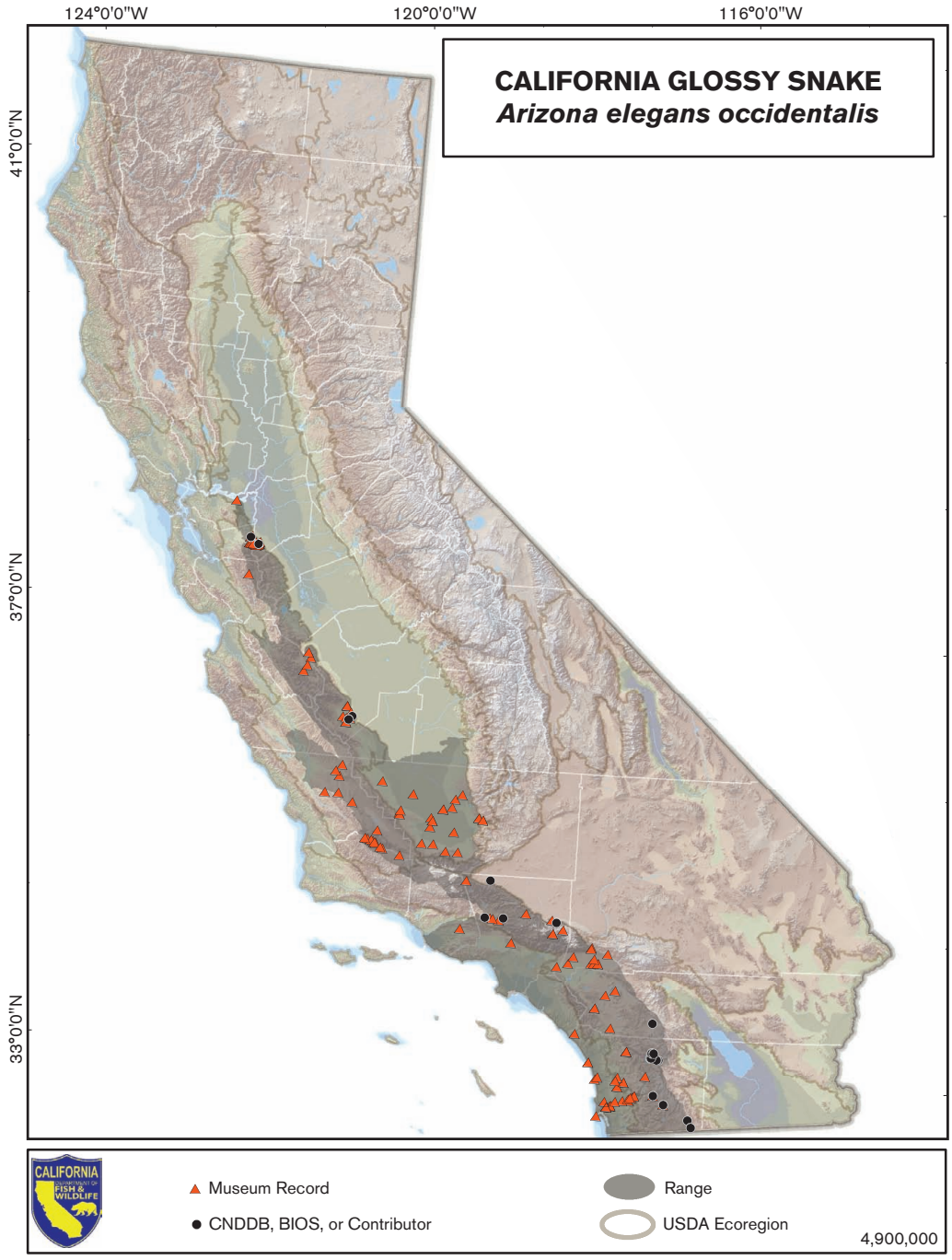

PHOTO ON PREVIOUS PAGE: California glossy snake, San Diego County, California. Courtesy of Jeff Lemm.

dark spot is usually present below each eye (Klauber 1946).

In California, this taxon could be confused with other subspecies of *A. elegans*, with the gopher snake (*Pituophis catenifer*), or the night snakes (*Hypsiglena* spp.). This subspecies is generally darker than other subspecies of *A. elegans* in California, though intergrades are common along the desert slopes of the coastal mountains (Klauber 1946). Generally, *A. e. occidentalis* is best distinguished from other subspecies based on range. *Pituophis catenifer* has keeled scales and (usually) two pairs of prefrontals, while *Hypsiglena* is smaller (up to 66 cm), has strongly elliptical pupils, and an extensive dark blotch on the neck (Stebbins 2003).

Taxonomic Relationships

Arizona elegans occidentalis was initially described on the basis of scale counts and dorsal blotching and included all snakes in this genus ranging from California through southeastern Arizona (Blanchard 1924). Klauber (1946) later restricted this taxon and described two new subspecies occurring in eastern California (the Mojave glossy snake, *A. e. candida*, and the desert glossy snake, *A. e. eburnata*), which differ from *A. e. occidentalis* primarily in body color. Intraspecific (or intrageneric) variation has not yet been assessed genetically, although at the generic level, *Arizona* appears to be a relatively distant sister taxon to the long-nosed snake (*Rhinocheilus lecontei*) (Pyron and Burbrink 2009).

Life History

Arizona elegans is a nocturnal snake that is generally active from late February until November, depending on local weather conditions (Klauber 1946, Grismer 2002). In California, *A. e. occidentalis* reaches peak activity during May (Klauber 1946; S. Sweet, pers. comm.), with few specimens being collected throughout the remainder of the summer (Klauber 1939, Goldberg 2000). The species feeds primarily on diurnal lizards, which it captures while they sleep, and small nocturnal mammals, which it ambushes (Klauber 1946, Rodríguez-Robles et al. 1999a). In a sample of 107 prey specimens, 50% were lizards (primarily *Sceloporus* and *Uta*) and 44% were mammals (primarily small rodents). Larger specimens are also known to take small birds and other snakes (Rodríguez-Robles et al. 1999a).

Arizona elegans retreats to burrows during the day, using either existing mammal burrows, excavations under rocks, or creating burrows for itself (Klauber 1946, Degenhardt et al. 1996). This species can be nocturnally active at relatively low temperatures (as low as 14°C, though typically 19–20°C; Cowles and Bogert 1944).

Reproduction is poorly studied in the wild, but museum specimens indicate that ovulation begins in June, and spermiogenesis occurs in late summer (Goldberg 2000). In *A. elegans* from New Mexico, ovulation also begins in June with oviposition occurring in July (Aldridge 1979). Clutch size is poorly documented in this subspecies, though two individuals contained three and seven eggs, respectively (Reynolds 1943, Klauber 1946). Across *A. elegans*, clutch size varies widely from 3 to 23 eggs, with a mean of 8.5 (Fitch 1970). Recent hatchlings are typically found in September (S. Sweet, pers. comm.).

Habitat Requirements

Arizona elegans is found in a wide variety of habitat types, including open desert, grasslands, shrublands, chaparral, and woodlands. However, only a subset of these habitat types occurs within *A. e. occidentalis*' range, primarily grasslands, fields, coastal sage scrub, and chaparral (Klauber 1946). No studies of habitat requirements exist, although this subspecies appears to prefer open microhabitats. The majority of records occur in relatively open patches in a surrounding matrix of denser vegetation (Klauber 1946). This subspecies can be patchy within its range, with certain areas consistently producing more records than others that have seemingly identical habitat (Klauber

1946). *Arizona elegans* appears to prefer areas where the soil is loose, which allows for burrowing (Grismer 2002, Stebbins 2003). Unpublished survey data indicate that *A. e. occidentalis* may prefer sandy soil habitats such as coastal sand dunes, alluvial creek beds, and ancient dunes on the marine terraces (R. Fisher, pers. comm.).

Distribution (Past and Present)

Range-wide, *Arizona elegans* occurs throughout much of southwestern North America, extending east as far as central Texas, Oklahoma, and Kansas, and south to central Mexico. Klauber (1946) restricted *A. e. occidentalis* to the central San Joaquin Valley south to the Tehachapi Mountains and along the base of the Coast Range mountains farther south to San Quintin, Baja California. This subspecies is known to occur from sea level to ~1800 m (Lemm 2006).

Arizona elegans occidentalis has apparently declined throughout much of its range. In San Diego County, survey data are available for Torrey Pines State Reserve, Point Loma, and the Tijuana Estuary. The subspecies was formerly present in these areas but now appears to be extirpated (Wells 1998, Case and Fisher 2001, Fisher 2004). Extensive agricultural development and habitat modification throughout the San Joaquin Valley and urban development within the Los Angeles basin have likely led to declines and/or extirpations in these areas as well (Stebbins 2003; R. Fisher, pers. comm.).

Trends in Abundance

Few abundance data exist for this subspecies. However, extensive early surveys of snakes in San Diego County failed to find the species, suggesting that they were uncommon (Klauber 1924). Bogert (1930) was aware of only two records for Los Angeles County. Klauber (1946) observed that *Arizona elegans occidentalis* existed in lower densities, relative to the total snake population, than either *A. e. candida* or *A. e. eburnata*, and that *A. e. occidentalis* was patchily distributed. Pitfall trapping data collected by the US Geological Survey (USGS) over 17 years in San Diego, Orange, and Los Angeles Counties have resulted in only a single capture of this taxon (C. Rochester, pers. comm.). Presently, the subspecies is found less commonly than it once was throughout the San Diego region (Case and Fisher 2001, Lemm 2006). Both low densities and patchiness could make this taxon particularly susceptible to declines and may explain why the species has seemingly disappeared from some areas, while several other colubrid snakes remain present. Development continues within the species' range and thus ongoing declines in abundance are likely.

Nature and Degree of Threat

The greatest threat to this subspecies is habitat modification due to agricultural, commercial, and residential development. However, the specific mechanisms that cause declines are not well understood. Abundant prey and small habitat blocks that appear suitable remain in some developed areas, although the species may be sensitive to the light pollution arising from this development (Perry and Fisher 2006, Perry et al. 2008). This species' response to wildfire is not well understood, but increasing frequency and intensity of wildfires due to climate change may plausibly lead to habitat modification that impacts this taxon. The projected changes in wildfire regime in this area are mixed (PRBO 2011), so the degree of this threat is still unknown. Wildfires that are small in scale and intensity may have a beneficial impact by temporarily clearing patches of chaparral habitat, which then recover over a period of a few years, creating the patchwork of open and densely vegetated habitat that this species appear to prefer. Large and intense wildfires, conversely, kill chaparral and convert large habitat patches to grassland for longer periods of time. This process would likely have a detrimental impact on this species.

Status Determination

A moderately small range and moderate degree of ecological specialization and endemism,

coupled with documented declines within this species range and projected impacts from ongoing development, contribute to a Priority 1 designation for this subspecies.

Management Recommendations

Habitat protection is currently the most important management priority for *Arizona elegans occidentalis*. The studies outlined below will help to characterize habitat usage, home range size, distribution, and abundance. Once these data become available, a more specific management program can be developed that targets specific remaining populations and protects appropriately sized habitat blocks for the species' home range size and movement patterns.

Monitoring, Research, and Survey Needs

This is a poorly studied component of California's herpetofauna. Two immediate research priorities exist for this taxon. First, ecological studies need to be initiated to enhance our currently poor understanding of the life history and existing population sizes in this subspecies. Without this basic information, designing a coherent management strategy is impossible. These studies should take place in concert with survey efforts to more precisely quantify the subspecies' present distribution. These surveys should employ a variety of techniques, likely including night driving, snake trapping, and artificial cover object transects in order to increase capture success. If reasonably high capture rates can be obtained, individually marking snakes for mark–recapture population size estimates should also be performed. Radiotelemetry studies may be a fruitful means for determining home range size and more thoroughly characterizing habitat usage, particularly given the indications that this species might have specific microhabitat preferences. Second, a species-wide phylogeographic study should be performed in order to elucidate intraspecific variation and identify appropriate units for conservation. Phylogenetic and phylogeographic studies of other wide-ranging snakes have frequently led to changes in the understanding of species boundaries and diversity, including the genetic diversity that exists within a species and its concordance with morphological subspecies boundaries. Finer-scale landscape ecological studies, particularly in concert with radiotelemetry on the same landscapes, would also provide important information for conservation strategies. These important data are entirely lacking for this taxon at present.