



### SIERRA NIGHT LIZARD

*Xantusia vigilis sierrae* Bezy 1967

#### Status Summary

*Xantusia vigilis sierrae* is a Priority 3 Species of Special Concern, receiving a Total Score/Total Possible of 47% (52/110). During the previous evaluation, it was also considered a Species of Special Concern (Jennings and Hayes 1994a).

#### Identification

*Xantusia vigilis sierrae* is a small (4–5.1 cm SVL), somewhat flattened lizard with granular dorsal scales, enlarged square ventral scales, soft skin, and a prominent gular fold (Bezy 1967, Stebbins 2003). The head is covered with enlarged plates, the eyes are lidless, and the pupils are vertical (Stebbins 2003). Most specimens are olive or grayish brown above, with a pattern of interconnected dark markings that form a network, which may give the animal a mottled appearance (Bezy 1967, Stebbins 2003). The ventral surface is light bluish pink and generally unmarked (Bezy 1967). A prominent light stripe extends from the rear of the

eye posteriorly to the neck or just beyond the neck (Bezy 1967).

Within its range, *X. v. sierrae* is unlikely to be confused with other species, although it is similar in appearance to the Yucca night lizard

#### Sierra Night Lizard: Risk Factors

| Ranking Criteria (Maximum Score)                 | Score |
|--|-------|
| i. Range size (10)                               | 10    |
| ii. Distribution trend (25)                      | 0     |
| iii. Population concentration/<br>migration (10) | 0     |
| iv. Endemism (10)                                | 10    |
| v. Ecological tolerance (10)                     | 10    |
| vi. Population trend (25)                        | 5     |
| vii. Vulnerability to climate change (10)        | 10    |
| viii. Projected impacts (10)                     | 7     |
| Total Score                                      | 52    |
| Total Possible                                   | 110   |
| Total Score/Total Possible                       | 0.47  |

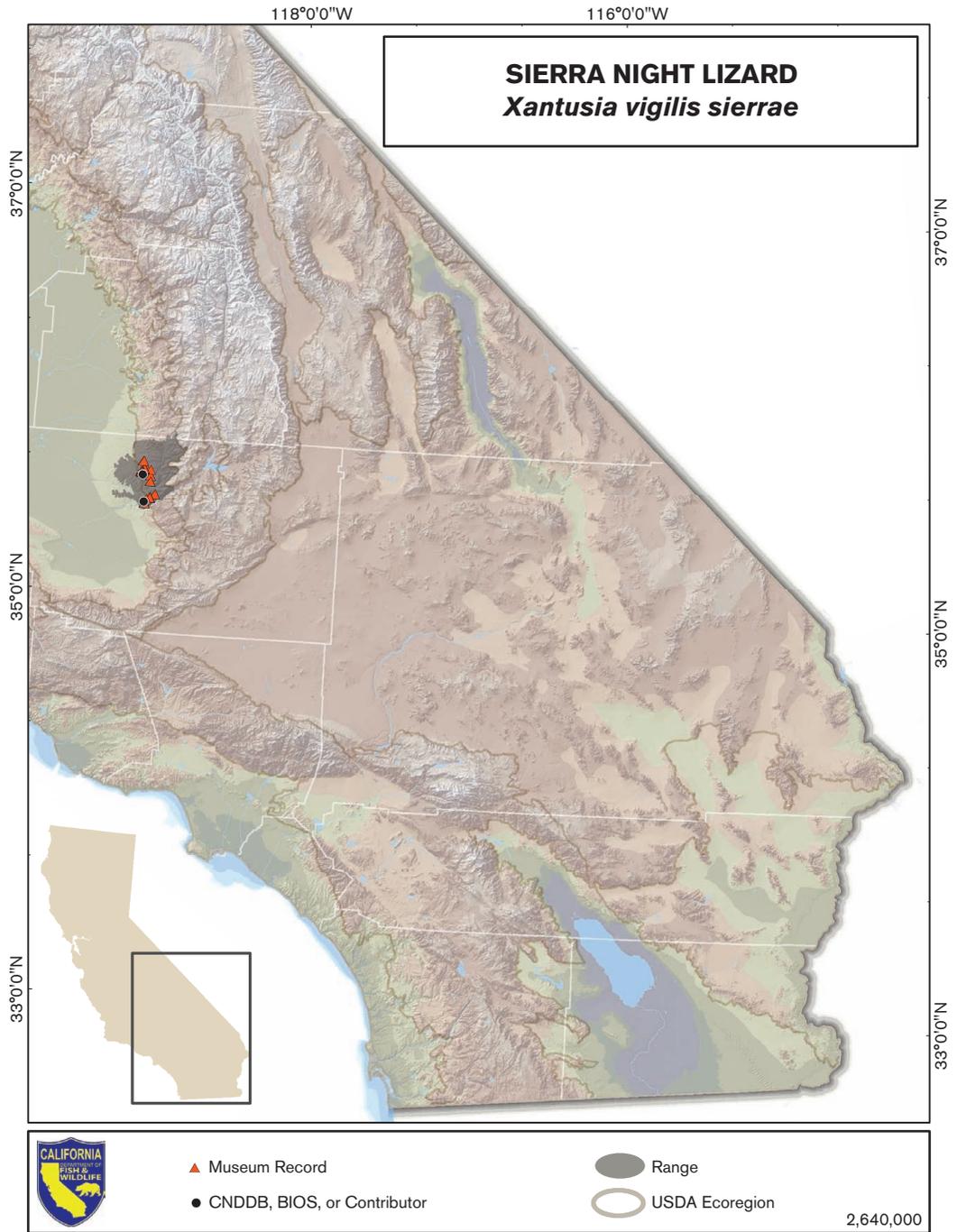


PHOTO ON PREVIOUS PAGE: Sierra night lizard, Kern County, California. Courtesy of Jackson Shedd.

(*X. v. vigilis*), which occurs nearby. *Xantusia vigilis vigilis* has fairly distinct dark spots on the dorsal surface that do not form a network, though they form narrow longitudinal stripes in some populations (Stebbins 2003). Several aspects of the scalation also differentiate these two subspecies (Bezy 1967).

#### Taxonomic Relationships

*Xantusia vigilis sierrae* is a member of the *X. vigilis* species complex. It was initially recognized on the basis of habitat type, coloration, scalation, and femoral pore count (Bezy 1967). Since its initial recognition, genetic analyses have shown that *X. v. sierrae* forms a monophyletic group embedded within *X. vigilis* for mitochondrial and nuclear DNA sequence data (Sinclair et al. 2004, Leavitt et al. 2007). Allozyme data also suggest that it is distinct, but a close relative of *X. v. vigilis* (Bezy and Sites 1987). One population of *X. v. vigilis* that occurs within 60 km of *X. v. sierrae* is suspected to contain intergrades based on femoral pore counts (Bezy 1967), although geographically more proximate populations (~20 km apart) show no evidence of this intermediate condition (Leavitt et al. 2007). Sinclair et al. (2004) considered *X. v. sierrae* a “candidate species” whose status required further testing with additional data. Some recent taxonomic lists have elevated it to species status without additional justification (de Queiroz and Reeder 2008, Collins and Taggart 2009). The weight of current evidence suggests that species status is probably warranted, and a population genetic analysis of *X. v. sierrae* and nearby *X. v. vigilis* populations is needed help clarify this issue. In particular, such a study could quantify whether, and to what extent, migration and intergradation occur along the eastern edge of the taxon’s range.

#### Life History

The life history of *Xantusia vigilis sierrae* has not been studied. However, among xantusiid species that have been examined, life history

features are largely conserved across southwestern United States, and we assume that the life history of *X. v. vigilis* may be a good predictor for *X. v. sierrae* in many respects. *Xantusia vigilis sierrae* is primarily a rock-dwelling species, whereas *X. v. vigilis* is more of a habitat generalist with some preference for fallen vegetation. Some aspects of the life history may therefore be more similar to other rock-specialist night lizards (e.g., *X. henshawi* or *X. gracilis*).

Based on information from other species, *X. v. sierrae* is probably a generalist predator that consumes a variety of small invertebrate prey (Brattstrom 1952, Stebbins 2003, Bezy 2009). Its diet is probably dominated by ants and other insects that occur within crevices (Brattstrom 1952, Bezy 2009). *Xantusia vigilis sierrae* is probably long-lived and takes 2.5–3.5 years to reach sexual maturity (Lee 1975), eventually producing 1 or 2 live young/year (Brattstrom 1951). This species likely has a low metabolic rate relative to other lizards and grows slowly (Mautz 1979). Daily activity cycles are unknown. Some rock-dwelling night lizards are largely diurnal and/or crepuscular (*X. henshawi*; Mautz and Case 1974), while others appear to be nocturnal (*X. gracilis*; Grismer and Galavan 1986).

#### Habitat Requirements

*Xantusia vigilis sierrae* is known primarily from exfoliating granite outcrops (Bezy 1967), though it can also be found under tree bark that has fallen on the ground or is loosely attached to trees (D. Leavitt, pers. comm.). Within its rocky habitat type, this species is more frequently found under large horizontal cap rocks than the more numerous, vertically oriented smaller flakes (Bezy 1967). *Xantusia vigilis sierrae* is also more frequently found in small clusters of one or a few boulders than in larger rock piles on rocky slopes and canyons (Bezy 1967). Some authors have speculated that this may reflect varying abundances associated with differences in predator access

(Jennings and Hayes 1994a), although it is also possible that it reflects differences in detectability. The dominant vegetation of its preferred habitat is foothill grassland with interspersed shrubs and woody vegetation (Bezy 1967).

#### *Distribution (Past and Present)*

*Xantusia vigilis sierrae* is known only from rocky hillsides on the western edge of the Greenhorn Mountains near Granite Station, Kern County, California (Bezy 1967, Stebbins 2003). The known elevational range extends from 450 to 500 m (Bezy 1967). No significant changes in distribution are known, although the development of small ranches may impact populations in the area.

#### *Trends in Abundance*

No historical or current abundance data are available for this taxon, although these lizards do not currently appear to be rare (D. Leavitt, pers. comm.). Moderate habitat degradation from previous collecting efforts as well as moderate amounts of landscape modification may be causing declines (R. Fisher, pers. comm.), although this has not been confirmed.

#### *Nature and Degree of Threat*

The primary threat facing *Xantusia vigilis sierrae* is its exceedingly small range that occurs on unprotected land. Development in the region is taking place and could have catastrophic effects on the existing populations, as could any fragmentation of the habitat that isolates granite outcrops in which this lizard lives. The rock cap and crevice habitat that this species prefers is also susceptible to degradation by humans (Jennings and Hayes 1994a, Stebbins 2003; D. Leavitt, pers. comm.).

#### *Status Determination*

*Xantusia vigilis sierrae* is a narrowly distributed habitat specialist that is endemic to a small region of the Sierra Nevada. However, no distributional declines have been documented, and

only small declines in abundance are suspected, resulting in a Priority 3 designation.

#### *Management Recommendations*

To protect this species, habitat loss and degradation need to be avoided. Effective protection of this species can likely be accomplished by protecting rocky habitats from most human interference, including intensive collecting efforts and protecting the surrounding area from development. Housing development in the form of ranchettes and other rural development projects should be closely managed to avoid impacting *Xantusia vigilis sierrae* populations, including provisions for habitat corridors to prevent fragmentation. It is unknown whether grazing adversely affects the species.

#### *Monitoring, Research, and Survey Needs*

Given the almost complete dearth of ecological work on this species, several research and monitoring needs are required for its future management and protection. Until recently, this species was known only to inhabit exfoliating granite, although its actual habitat utilization now seems to be somewhat broader than this. Further study of habitat use and preferences in *Xantusia vigilis sierrae* is essential to establish an effective management program.

A long-term population monitoring program needs to be initiated for this species, ideally across all utilized habitat types. These monitoring programs need not be extensive, but at minimum should document population size in disturbed and pristine habitats at regular intervals. Such monitoring can provide both critical data on natural population fluctuations and an early warning of declines in their initial stages.

Finally, genetic analyses using multiple nuclear markers are needed to address two important conservation issues. First, additional work at the phylogeographic/species boundary level is needed to determine whether *X. v. sierrae* is best considered a species or subspecies

within the *X. vigilis* complex. An important aspect of this work should be to examine populations in close proximity to *X. v. vigilis* to determine the degree and extent of admixture between these taxa. Second, landscape genetic work across its limited range is needed to quantify the degree of population isolation and substructure among habitat patches, migration

corridors that are most heavily used by the lizards, and effective population sizes of populations in ecologically diverse habitat patches. Ideally, tissue samples in the form of small tail clips should be collected each year from study populations to allow for genetic as well as demographic estimation of population size fluctuations over time.