APPENDIX 1

List of Native Amphibian and Reptile Taxa Occurring in California

Taxon[1]	Common name	CDFG special animal	USFWS[2]	CDFW[3]	IUCN[4]	USFS[5]	BLM
		Anura					
Ascaphidae							
Ascaphus truei	Coastal tailed frog	X		SSC	LC		
Bufonidae[6]							
Bufo alvarius	Sonoran Desert toad	X		SSC	LC		
Bufo boreas boreas	Western toad				NT		
Bufo boreas halophilus	California western toad				NT		
Bufo californicus	Arroyo toad	X	E	SSC	E		
Bufo canorus	Yosemite toad	X	T	SSC	E	S	
Bufo cognatus	Great Plains toad				LC		
Bufo exsul	Black toad	X		T, FP	V	S	S
Bufo punctatus	Red-spotted toad				LC		
Bufo woodhousii	Woodhouse's toad				LC		
Hylidae							
Pseudacris cadaverina	California treefrog				LC		
Pseudacris regilla[7]	Pacific treefrog				LC		
Ranidae							
Rana aurora	Northern red-legged frog	X		SSC	LC	S	
Rana boylii	Foothill yellow-legged frog	X		SSC	NT	S	S

(continued)

Taxon[1]	Common name	CDFG special animal	USFWS[2]	CDFW[3]	IUCN[4]	USFS[5]	BLM
			Anura				
Rana cascadae	Cascades frog	X		SSC	NT	S	
Rana draytonii	California red-legged frog	X	T	SSC	V		
Rana muscosa	Southern Mountain yellow-legged frog	X	E	E	E	S	
Rana pipiens[8,9]	Northern leopard frog	X		SSC	LC		
Rana pretiosa[10]	Oregon spotted frog	X	T	SSC	V		S
Rana sierrae	Sierra Nevada yellow-legged frog	X	E	E	E	S	
Rana yavapaiensis	Lowland leopard frog	X		SSC	LC		S
Scaphiopodidae							
Scaphiopus couchii	Couch's spadefoot	X		SSC	LC		S
Spea hammondii	Western spadefoot	X		SSC	NT		S
Spea intermontana	Great basin spadefoot				LC		
			Caudata				
Ambystomatidae							
Ambystoma californiense	California tiger salamander	X	T	T	V		
Ambystoma californiense "Santa Barbara"	Santa Barbara tiger salamander	X	E	T	V		
Ambystoma californiense "Sonoma"	Sonoma tiger salamander	X	E	T	V		
Ambystoma gracile	Northwestern salamander				LC		
Ambystoma macrodactylum croceum	Santa Cruz long-toed salamander	X	E	E, FP	LC		
Ambystoma macrodactylum sigillatum	Southern long-toed salamander			SSC	LC		
Dicamptodontidae							
Dicamptodon ensatus	California giant salamander			SSC	NT		
Dicamptodon tenebrosus	Pacific giant salamander				LC		

Plethodontidae							
Aneides ferreus	Clouded salamander				NT		
Aneides flavipunctatus	Black salamander				NT		
Aneides flavipunctatus niger	Santa Cruz black salamander			SSC	NT		
Aneides flavipunctatus "shasta"[11]	Shasta black salamander				NT		
Aneides lugubris	Arboreal salamander				LC		
Aneides vagrans	Wandering salamander				NT		
Batrachoseps altasierrae	Greenhorn Mountains slender salamander						
Batrachoseps attenuatus	California slender salamander				LC		
Batrachoseps bramei	Fairview slender salamander					S	
Batrachoseps campi	Inyo Mountains salamander	X		SSC	E	S	S
Batrachoseps diabolicus	Hell Hollow slender salamander	X			DD		
Batrachoseps gabrieli	San Gabriel Mountains slender salamander	X			DD	S	
Batrachoseps gavilanensis	Gabilan Mountains slender salamander				LC		
Batrachoseps gregarius	Gregarius slender salamander	X			LC		
Batrachoseps incognitus	San Simeon slender salamander	X			DD	S	
Batrachoseps kawia	Sequoia slender salamander	X			DD		
Batrachoseps luciae	Santa Lucia Mountains slender salamander	X			LC		
Batrachoseps major aridus	Desert slender salamander	X	E	E	LC		
Batrachoseps major major	Garden slender salamander				LC		
Batrachoseps minor	Lesser slender salamander	X		SSC	DD	S	
Batrachoseps nigriventris	Black-bellied slender salamander				LC		

(continued)

Taxon[1]	Common name	CDFG special animal	USFWS[2]	CDFW[3]	IUCN[4]	USFS[5]	BLM
			Caudata				
Batrachoseps pacificus	Channel Islands slender salamander	X			LC		
Batrachoseps regius	Kings River slender salamander	X			V	S	
Batrachoseps relictus	Relictual slender salamander	X		SSC	DD	S	
Batrachoseps robustus	Kern Plateau salamander	X			NT		
Batrachoseps simatus	Kern Canyon slender salamander	X		T	V	S	
Batrachoseps stebbinsi	Tehachapi slender salamander	X		T	V		S
Ensatina eschscholtzii croceater	Yellow-blotched ensatina	X			LC	S	S
Ensatina eschscholtzii eschscholtzii	Monterey ensatina				LC		
Ensatina eschscholtzii klauberi	Large-blotched ensatina	X			LC	S	
Ensatina eschscholtzii oregonensis	Oregon ensatina				LC		
Ensatina eschscholtzii picta	Painted ensatina				LC		
Ensatina eschscholtzii platensis	Sierra Nevada ensatina				LC		
Ensatina eschscholtzii xanthoptica	Yellow-eyed ensatina				LC		
Hydromantes brunus	Limestone salamander	X		T, FP	V	S	S
Hydromantes platycephalus[12]	Mount Lyell salamander	X			LC		
Hydromantes shastae	Shasta salamander	X		T	V	S	S
Plethodon asupak	Scott River salamander	X		T	V		
Plethodon dunni	Dunn's salamander				LC		
Plethodon elongatus	Del Norte salamander	X			NT		
Plethodon stormi	Siskiyou Mountains salamander	X		T	E	S	
Rhyacotritonidae							
Rhyacotriton variegatus	Southern torrent salamander	X		SSC	LC	S	

Salamandridae							
Taricha granulosa	Rough-skinned newt				LC		
Taricha rivularis	Red-bellied newt			SSC	LC		
Taricha sierrae	Sierra newt				LC		
Taricha torosa	Coast Range newt	X		SSC[13]	LC		
	Squamata—Lizards						
Anguidae							
Elgaria coerulea coerulea	San Francisco alligator lizard				LC		
Elgaria coerulea palmeri	Sierra Nevada alligator lizard				LC		
Elgaria coerulea principis	Northwestern alligator lizard				LC		
Elgaria coerulea shastensis	Shasta alligator lizard				LC		
Elgaria multicarinata multicarinata	California alligator lizard				LC		
Elgaria multicarinata scincicauda	Oregon alligator lizard				LC		
Elgaria multicarinata webbii	San Diego alligator lizard				LC		
Elgaria panamintina	Panamint alligator lizard	X		SSC	V	S	S
Anniellidae							
Anniella pulchra pulchra[14]	Silvery legless lizard	X		SSC	LC	S	
Anniella pulchra nigra	Black legless lizard	X		SSC	LC	S	
Crotophytidae							
Crotaphytus bicinctores	Great Basin collared lizard				LC		
Crotaphytus vestigium	Baja California collared lizard				LC		
Gambelia copeii	Cope's leopard lizard			SSC	LC		
Gambelia sila	Blunt-nosed leopard lizard	X	E	E. FP	E		
Gambelia wislizenii	Long-nosed leopard lizard				LC		

(continued)

Taxon[1]	Common name	CDFG special animal	USFWS[2]	CDFW[3]	IUCN[4]	USFS[5]	BLM
		Squamata—Lizards					
Gekkonidae							
Coleonyx switaki	Barefoot gecko	X		T	LC		S
Coleonyx variegatus abbotti	San Diego banded gecko	X		SSC	LC		
Coleonyx variegatus variegatus	Desert banded gecko				LC		
Phyllodactylus nocticolus	Peninsular leaf-toed gecko				LC		
Helodermatidae							
Heloderma suspectum cinctum	Banded Gila monster	X		SSC	NT		S
Iguanidae							
Dipsosaurus dorsalis	Desert iguana				LC		
Sauromalus ater	Common chuckwalla				LC		
Phrynosomatidae							
Callisaurus draconoides	Zebra-tailed lizard				LC		
Petrosaurus mearnsi	Banded rock lizard				LC		
Phrynosoma blainvillii[15]	Coast horned lizard	X		SSC	LC	S	S
Phrynosoma douglasii	Pigmy short-horned lizard				LC		
Phrynosoma mcallii	Flat-tailed horned lizard	X		SSC	NT	S	S
Phrynosoma platyrhinos calidiarum	Southern desert horned lizard				LC		
Phrynosoma platyrhinos platyrhinos	Northern desert horned lizard				LC		
Sceloporus graciosus gracilis	Western sagebrush lizard				LC		
Sceloporus graciosus graciosus	Northern sagebrush lizard	X			LC		S
Sceloporus graciosus vandenburgianus	Southern sagebrush lizard				LC		

Sceloporus magister uniformis[16]	Yellow-backed desert spiny lizard				LC			
Sceloporus magister transversus	Barred desert spiny lizard				LC			
Sceloporus occidentalis becki	Island fence lizard				LC			
Sceloporus occidentalis biseriatus	San Joaquin fence lizard				LC			
Sceloporus occidentalis bocourtii	Coast Range fence lizard				LC			
Sceloporus occidentalis longipes	Great Basin fence lizard				LC			
Sceloporus occidentalis occidentalis	Northwestern fence lizard				LC			
Sceloporus occidentalis taylori	Sierra fence lizard				LC			
Sceloporus orcutti	Granite spiny lizard				LC			
Uma inornata	Coachella Valley fringe-toed lizard	X		T	E	E		
Uma notata	Colorado Desert fringe-toed lizard	X			SSC	NT		S
Uma scoparia	Mojave fringe-toed lizard	X			SSC	LC		S
Urosaurus graciosus	Long-tailed brush lizard					LC		
Urosaurus nigricaudus	Baja California brush lizard					LC		
Urosaurus ornatus	Ornate tree lizard					LC		
Uta stansburiana elegans	Western common side-blotched lizard					LC		
Uta stansburiana nevadensis	Nevada common side-blotched lizard					LC		
Uta stansburiana stansburiana	Northern common side-blotched lizard					LC		
Scincidae								
Plestiodon gilberti	Gilbert's skink					LC		
Plestiodon skiltonianus skiltonianus	Western skink					LC		
Plestiodon skiltonianus interparietalis	Coronado skink	X				LC		S
Teiidae								
Aspidoscelis hyperythra	Orange-throated whiptail	X				LC	S	

(continued)

Taxon[1]	Common name	CDFG special animal	USFWS[2]	CDFW[3]	IUCN[4]	USFS[5]	BLM
		Squamata—Lizards					
Aspidoscelis tigris munda	California whiptail				LC		
Aspidoscelis tigris stejnegeri	Coastal whiptail	X		SSC	LC		
Aspidoscelis tigris tigris	Great Basin whiptail				LC		
Xantusiidae							
Xantusia gracilis	Sandstone night lizard	X		SSC	V		
Xantusia henshawi	Henshaw's night lizard				LC		
Xantusia riversiana	Island night lizard	X			LC		
Xantusia vigilis sierrae[17]	Sierra night lizard	X		SSC	LC		
Xantusia vigilis vigilis[17]	Desert night lizard				LC		
Xantusia wigginsi	Baja California night lizard				LC		
Xantusia sp. "Yucca Valley"	Yucca Valley night lizard				LC		
Xantusia sp. "San Jacinto"	San Jacinto night lizard				LC		
		Squamata—Snakes					
Boidae							
Charina bottae bottae	Rubber boa				LC		
Charina bottae umbratica	Southern rubber boa	X		T	LC	S	
Lichanura orcutti[18]	California rosy boa	X			LC	S	
Colubridae							
Arizona elegans candida	Mojave glossy snake				LC		
Arizona elegans eburnata	Desert glossy snake				LC		
Arizona elegans occidentalis	California glossy snake			SSC	LC		
Bogertophis rosaliae	Baja California rat snake	X			LC		

Chionactis occipitalis annulata	Colorado shovel-nosed snake				LC			
Chionactis occipitalis occipitalis	Mojave shovel-nosed snake				LC			
Chionactis occipitalis talpina	Nevada shovel-nosed snake				LC			
Coluber constrictor mormon	Western yellow-bellied racer				LC			
Contia longicauda	Forest sharp-tailed snake				LC			
Contia tenuis	Common sharp-tailed snake				LC			
Diadophis punctatus "Coastal CA"[19]	Ring-necked snake				LC			
Diadophis punctatus "Eastern CA"	Ring-necked snake				LC			
Diadophis punctatus "Southern CA"	Ring-necked snake	X			LC	S		
Diadophis punctatus "Great Basin"[20]	Ring-necked snake			SSC	LC			
Hypsiglena chlorophaea	Northern desert night snake				LC			
Hypsiglena ochrorhyncha klauberi	San Diego night snake				LC			
Hypsiglena ochrorhyncha nuchulata	California night snake				LC			
Lampropeltis californiae	Common kingsnake				LC			
Lampropeltis multifasciata[21]	California mountain kingsnake	X			LC	S	S	
Lampropeltis zonata	California mountain kingsnake				LC		S	
Masticophis flagellum piceus[22]	Red coachwhip				LC			
Masticophis flagellum ruddocki	San Joaquin coachwhip	X		SSC	LC			
Masticophis fuliginosus	Baja California coachwhip			SSC	LC			
Masticophis lateralis euryxanthus	Alameda striped racer	X	T	T	LC			
Masticophis lateralis lateralis	California striped racer				LC			
Masticophis taeniatus	Striped whipsnake				LC			
Phyllorhynchus decurtatus	Spotted leaf-nosed snake				LC			
Pituophis catenifer affinis	Sonoran gopher snake				LC			
Pituophis catenifer annectens	San Diego gopher snake				LC			

(continued)

Taxon[1]	Common name	CDFG special animal	USFWS[2]	CDFW[3]	IUCN[4]	USFS[5]	BLM
		Squamata—Snakes					
Pituophis catenifer catenifer	Pacific gopher snake				LC		
Pituophis catenifer deserticola	Great Basin gopher snake				LC		
Pituophis catenifer pumilis	Santa Cruz Island gopher snake	X			LC		
Rhinocheilus lecontei	Long-nosed snake				LC		
Salvadora hexalepis hexalepis	Desert patch-nosed snake				LC		
Salvadora hexalepis mojavensis	Mojave patch-nosed snake				LC		
Salvadora hexalepis virgultea	Coast patch-nosed snake	X		SSC	LC		
Sonora semiannulata	Western ground snake				LC		
Tantilla hobartsmithi	Southwestern black-headed snake				LC		
Tantilla planiceps	California black-headed snake				LC		
Thamnophis atratus atratus	Santa Cruz aquatic garter snake				LC		
Thamnophis atratus hydrophilus	Oregon aquatic garter snake				LC		
Thamnophis atratus zaxanthus	Diablo Range aquatic garter snake				LC		
Thamnophis couchii	Sierra (western aquatic) garter snake				LC		
Thamnophis elegans elegans	Mountain terrestrial garter snake				LC		
Thamnophis elegans terrestris	Coast terrestrial garter snake				LC		
Thamnophis elegans vagrans	Wandering terrestrial garter snake				LC		
Thamnophis gigas	Giant garter snake	X	T	T	V		
Thamnophis hammondii	Two-striped garter snake	X		SSC	LC	S	S
Thamnophis marcianus	Checkered garter snake						
Thamnophis ordinoides	Northwestern garter snake				LC		
Thamnophis sirtalis fitchi	Valley garter snake				LC		

Thamnophis sirtalis infernalis[23]	California red-sided garter snake	X		SSC[24]	LC		
Thamnophis sirtalis tetrataenia	San Francisco garter snake	X	E	E, FP	LC		
Trimorphodon lambda	Sonoran lyre snake						
Trimorphodon lyrophanes	Peninsular lyre snake						
Leptotyphlopidae							
Rena humilis humilis[25]	Southwestern blind snake				LC		
Rena humilis cahuilae	Desert blind snake				LC		
Viperidae							
Crotalus atrox	Western diamond-backed rattlesnake				LC		
Crotalus cerastes cerastes	Mojave Desert sidewinder				LC		
Crotalus cerastes laterorepens	Colorado Desert sidewinder				LC		
Crotalus mitchellii	Speckled rattlesnake				LC		
Crotalus oreganus helleri[26]	Southern Pacific rattlesnake				LC		
Crotalus oreganus lutosus	Great Basin rattlesnake				LC		
Crotalus oreganus oreganus	Northern Pacific rattlesnake				LC		
Crotalus ruber	Red diamond rattlesnake	X		SSC	LC	S	
Crotalus scutulatus	Northern Mojave rattlesnake				LC		
Crotalus stephensi	Panamint rattlesnake				LC		
	Testudines						
Emydidae							
Emys marmorata marmorata[27]	Northern western pond turtle	X		SSC	V	S	
Emys marmorata pallida	Southern western pond turtle	X		SSC	V	S	S

(continued)

Taxon[1]	Common name	CDFG special animal	USFWS[2]	CDFW[3]	IUCN[4]	USFS[5]	BLM
		Testudines					
Kinosternidae							
Kinosternon sonoriense	Sonora mud turtle	X		SSC	V		
Testudinidae							
Gopherus agassizii	Mohave Desert tortoise	X	T	T	V		

1. Species, subspecies, or Distinct Population Segment (DPS).
2. E: Endangered; T: Threatened.
3. E: Endangered; T: Threatened; FP: Fully Protect; SSC: Species of Special Concern.
4. E: Endangered; V: Vulnerable; NT: Near Threatened; LC: Least Concern; DD: Data Deficient.
5. S: Sensitive.
6. Frost et al. (2006a) recommend placing all California bufonids except *Bufo alvarius* in the genus *Anaxyrus*. Frost et al. (2009b) recommend that *B. alvarius* be placed in the genus *Incilius*.
7. Recuero et al. (2006a, 2006b) propose breaking *Pseudacris regilla* (sensu lato) into three distinct species. This proposal has not been widely accepted because the range boundaries of the three taxa are poorly characterized and significant haplotype sharing exists across these putative lineages that has not been studied.
8. This frog was widely introduced in California at one point, though presumed native populations were also present. The taxon may now be extirpated.
9. Frost et al. (2006a) recommend placing *Rana pipiens* and *R. muscosa* in the genus *Lithobates*.
10. It is likely that any populations on the eastern side of the Warner Mountains are actually *Rana luteiventris*. However, no specimens or data exist to clarify this issue. Until new data become available, *R. luteiventris* cannot be definitively included as a member of the Californian herpetofauna.
11. Following Rissler and Apodaca (2007).
12. An Owens Valley population was formerly presumed to be an undescribed taxon and has become widely recognized in the conservation community. Rovito (2010) refutes its status as a distinct lineage and we include the Owens Valley populations with *Hydromantes platycephalus*.
13. Status applies only to Monterey County, CA, and south.
14. Papenfuss and Parham (2013) proposed splitting *Anniella pulchra* in California into five species.
15. Leaché et al. (2009) revised the *Phrynosoma coronatum* complex, placing California populations of *P. coronatum* into *P. blainvilli*.
16. Schulte et al. (2006) propose that the *Sceloporus magister* subspecies be elevated to full species. This was refuted by Leaché and Mulcahy (2007).
17. Leavitt et al. (2007) find a significant genetic structure within the *Xantusia vigilis* complex. Taxonomic revisions may occur in the near future within this clade.
18. Wood et al. (2008) divided the rosy boas into two species, *Lichanura orcutti* and *L. trivirgata*. Their mitochondrial data indicate that *L. trivirgata* is present in extreme southern California, though newer unpublished nuclear data suggest that the species break actually occurs farther south, in Baja California, Mexico (D. Wood, pers. comm.).
19. Feldman and Spicer (2006) and Fontanella et al. (2008) find evidence for lineages that are not concordant with previously described subspecies boundaries. We follow the lineage designations from the latter study.
20. The Great Basin clade includes animals formerly assigned to *Diadophis punctatus regalis*. The SSC status refers only to populations occurring at isolated desert springs in Southern California.
21. Mountain kingsnake taxonomy is in flux. Rodríguez-Robles et al. (1999b) refute the formerly recognized subspecies and find evidence for four distinct lineages. Myers et al. (2013) find evidence for two species (the arrangement that we follow here). *Lampropeltis multifasciata* contains the former southern subspecies *Lampropeltis zonata parvirubra* and *L. z. pulchra*. The conservation status applies to these two subspecies
22. Nagy et al. (2004) propose combining *Masticophis* into the genus *Coluber*.
23. Southern populations of this subspecies may represent a distinct taxon and are currently under study (C. Mahrdt, pers. comm., E. Ervin, pers. comm.).
24. SSC status applies to only the southern portion of the range.
25. Adalsteinsson et al. (2009) propose placing California *Leptotyphlops* in the genus *Rena*.
26. Some authors treat the subspecies of *Crotalus oreganus* as distinct species.
27. Some authors place the western pond turtles in the monotypic genus *Actinemys*. Spinks et al. (2014) recommend elevating both pond turtle subspecies to species status.

APPENDIX 2

Public Comment Announcement

We solicited public comment on this project by posting the announcement on the right on the websites of the following organizations: California Department of Fish and Wildlife, Center for North American Herpetology, Ecological Society of America (ECOLOG-L), Partners in Amphibian and Reptile Conservation, and The Wildlife Society. In addition, we circulated the announcement widely to colleagues via email. Following the public comment period, we also contacted experts on each taxon under consideration to request advice, data, and reviews of early drafts of this document.

California's list of Amphibian and Reptile Species of Special Concern (ARSSC) is a critical component of the management and protection of amphibians and reptiles in the state. The current California ARSSC list is undergoing a complete revision to better reflect those taxa that require some measure of conservation to stabilize populations and avoid future listing under the California Endangered Species Act. To date, the ARSSC revision team has developed a set of risk metrics, compiled a list of nominee taxa, and completed a preliminary risk assessment for each nominee based on literature reviews and locality information. Now, we need your help to make sure that we have the most accurate and complete list possible of SSC for potential inclusion in the final list. The best list will require input from as many knowledgeable biologists as possible. If you have data, well-documented field experience, or unpublished observations that are relevant to California's amphibian and reptile fauna, we invite you to share them with us.

Further details, risk assessments, and instructions for submitting feedback are available at http://arssc.ucdavis.edu. The public comment period closes August 31st, 2009.

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APPENDIX 3

Watch List

The watch list comprises taxa that were previously, but are no longer, considered Species of Special Concern. Here we include an explanation for each taxon's change in status and discuss future conservation concerns regarding Watch List taxa.

California tiger salamander

(*Ambystoma californiense*)

Jennings and Hayes (1994a) identified this species as the highest-concern vernal pool-breeding amphibian in the state. In keeping with this assessment and recent research documenting its decline range-wide, *A. californiense* was listed under the California Endangered Species Act as a Threatened species in 2010, superseding Species of Special Concern status. See Bolster (2010) for the CDFW's recent status review. The species was also listed under the federal Endangered Species Act in 2000 (Santa Barbara; Endangered), 2003 (Sonoma; Endangered), and 2004 (Central; Threatened), as three separate Distinct Population Segments. Recent multi-locus phylogeographic work indicates that the Central Distinct Population Segment is composed of two separate lineages from the Inner Coast Range and Central Valley and that these may be best considered as separate units with different management needs (J. Johnson and B. Shaffer, unpublished data).

Orange-throated whiptail

(*Aspidoscelis hyperythra*)

This taxon was included by Jennings and Hayes (1994a) primarily because of habitat loss within its relatively narrow range. We place it on the Watch List because, thus far, it appears to tolerate habitat fragmentation better than many similarly distributed taxa, including the red diamond rattlesnake (*Crotalus ruber*), coast patch-nosed snake (*Salvadora hexalepis virgultea*), and California glossy snake (*Arizona elegans occidentalis*), all of which have experienced more severe declines; and it remains relatively common in many areas throughout its range. It is possible that further development and habitat fragmentation could cause more severe declines, so this taxon should be periodically reevaluated.

Baja California rat snake

(*Bogertophis rosaliae*)

Jennings and Hayes (1994a) included the *B. rosaliae* primarily as a precaution. Virtually nothing was known about the species in California except that, if it ever naturally occurred in the state, it was probably rare and restricted in distribution (only a single specimen has ever been recorded). In the intervening time, no additional specimens have been reported, and no new information has become available for this species. If this species is found to be a native component of the California fauna, the conservation status should be reevaluated when more is known about the populations and habitat of the snake in California.

Yellow-blotched ensatina

(*Ensatina eschscholtzii croceater*)

Jennings and Hayes (1994a) included this taxon primarily over concerns about land use changes within

its small range. We shared several of these concerns, although the severity of these threats appears to have decreased since 1994. As long as the planned preservation areas at Tejon Ranch remain in effect, a large amount of *E. e. croceater* habitat will remain protected, so designation as a Species of Special Concern may not be necessary. We include *E. e. croceater* on the Watch List to encourage reevaluation of habitat availability for this taxon in the future.

Large-blotched ensatina

(*Ensatina eschscholtzii klauberi*)

Jennings and Hayes (1994a) included this taxon primarily over concerns about ongoing development within its range. We agree that development has had, and is continuing to have, an impact on this species, although the severity of these impacts appears to be significantly less than those being experienced by other taxa with similar ranges. Further, the large-blotched Ensatina appears to be commonly found with stable populations throughout significant areas of its range, including protected parklands. If the extent of development increases within this salamander's range, it may become necessary to reconsider special concern status and more active management.

Mount Lyell web-toed salamander

(*Hydromantes platycephalus*)

This taxon was included by Jennings and Hayes (1994a) as a precaution, based on its patchy distribution and suspected susceptibility to local extirpations. We do not include *H. platycephalus* at this time because, although it is patchily distributed, the species appears to be stable throughout most of its range and is not experiencing appreciable risk from habitat disturbance (Wake and Papenfuss 2005). Additional populations have been found since the early 1990s, and the species appears to be relatively common at many sites. Although it is a California endemic, has a moderately small range, and is a narrow ecological specialist, this species does not appear to be currently at risk of immediate decline (Wake and Papenfuss 2005).

Owens Valley web-toed salamander

(*Hydromantes platycephalus*)

The Owens' Valley populations of *H. platycephalus* were included by Jennings and Hayes (1994a) as a precaution, both because little was known about the population biology of this elusive salamander and because it was strongly suspected that it was a distinct taxon. Research completed since 1994 suggests that these populations do not form a distinct lineage but instead are part of the more broadly distributed *H. platycephalus* lineage (Rovito 2010). As with *H. platycephalus*, additional localities have been found and populations appear to be stable, leading us to conclude that Species of Special Concern designation is not required at the present time (Wake and Papenfuss 2005).

Southern California mountain kingsnakes

(*Lampropeltis zonata parvirubra* and *L. z. pulchra*)

The two southern California subspecies *L. z. parvirubra* and *L. z. pulchra* were considered Species of Special Concern by Jennings and Hayes (1994a) on the basis of suspected declines due to illegal collecting and habitat destruction from some collectors. We agree that this has occurred, although the current scale of exploitation does not appear to threaten this species' long-term survival. We placed the species on the Watch List in recognition that collection pressure and/or habitat destruction could cause the need to provide additional protections in the future.

Santa Cruz Island gopher snake

(*Pituophis catenifer pumilis*)

Jennings and Hayes (1994a) included this taxon primarily because of its small range (it is restricted to Santa Cruz and Santa Rosa islands) and threats from feral ungulates and pigs. We removed this species from special concern status because the invasive mammals causing the primary threats have been removed from the largest part of the range, Santa Cruz Island (USNPS 2010). This island is also well protected from future development because it is a national park.

Coronado skink

(*Plestiodon skiltonianus interparietalis*)

Jennings and Hayes (1994a) included *P. s. interparietalis* primarily because it has a relatively restricted range and has disappeared from some areas. As with *Aspidoscelis hyperythra*, we agree that some declines have occurred, although their severity appears to be modest. If these declines continue, further protections may be warranted in the future.

Del Norte salamander

(*Plethodon elongatus*)

Jennings and Hayes (1994a) included the Del Norte salamander because of concerns regarding habitat specialization by inland populations and the potential for timber harvest to destroy these habitats. Although these are valid concerns, as well as for two

close relatives of *P. elongatus*, the Scott Bar salamander (*Plethodon asupak*) and Siskiyou Mountains salamander (*P. stormi*), population status across most of the range of this taxon appears to be stable. Inland populations are patchy and likely more vulnerable to habitat degradation, which is why we place this taxon on our Watch List (H. Welsh, pers. comm.).

Mountain yellow-legged frogs

(*Rana muscosa* and *R. sierrae*)

Mountain yellow-legged frogs were designated as Species of Special Concern by Jennings and Hayes (1994a) under the name *R. muscosa*. Vredenburg et al. (2007) divided *R. muscosa* (sensu lato) into two species on the basis of morphometric measurements, differences in advertisement call, and mitochondrial DNA: the Sierra Madre yellow-legged frog (*R. muscosa*) in the south and the Sierra Nevada yellow-legged frog (*R. sierrae*) in the north. Both species were state listed in 2013, superseding Species of Special Concern status. See Bonham and Lockhart (2011) for the CDFW's recent status review of these taxa.

APPENDIX 4

Additional Taxa in Need of Research and Monitoring

We identified the following taxa that did not qualify for Species of Special Concern status but nonetheless would benefit from some level of additional research and/or monitoring. We provide a brief description of our concerns for each of these taxa below.

Orange-throated whiptail

(*Aspidoscelis hyperythra*)

Aspidoscelis hyperythra occurs in California in a relatively narrow region of southern California. Much of its available habitat has been destroyed or is threatened by ongoing urbanization and development. Further, many of the areas where habitat persists have become fragmented by development in intervening areas. The taxon remains locally common in several areas, although this should be reevaluated periodically. Further habitat modification could lead to more declines that warrant additional protections. Additional threats may arise from increasing intensity and/or frequency of wildfire in the region.

San Gabriel Mountains slender salamander

(*Batrachoseps gabrieli*)

Batrachoseps gabrieli occurs in a small area in Los Angeles and San Bernardino Counties (Stebbins 2003). Very few localities are known for this taxon, and its range is probably not fully characterized (Goodman et al. 1998, Hansen et al. 2005d). The salamander appears to be limited to talus slopes in the vicinity of oak, big cone spruce, and pine (Wake 1996, Goodman et al. 1998). It exhibits limited surface activity and appears to specialize on an environment that is unlikely to be developed. This species' known range lies within the boundaries of the Angeles and San Bernardino National Forests and appears to be well protected at the present time. However, other narrowly distributed species of *Batrachoseps* have undergone large and unexplained declines, and it is possible that similar declines could occur for this species (Jennings and Hayes 1994a). For this reason, periodic monitoring and reevaluation of status of *B. gabrieli* is warranted.

Baja California rat snake

(*Bogertophis rosaliae*)

Bogertophis rosaliae is known only from a single road-killed specimen in California along Interstate 8 (specimen SDNHM 64416). It is unclear if this represents an escaped or discarded pet, a rare migrant from the known range farther south in Baja California, Mexico, or a regular, infrequently encountered component of the California reptile fauna. If a population does exist in California, ongoing development along the border in both the United States and Mexico is likely to isolate these populations from the main part of the range, which occurs farther south. If so, the California populations could be susceptible to stochastic effects associated with small populations, as well as habitat loss from development. In some areas this species appears to be associated with palm oases, which are uncommon habitat patches, so any degradation of this habitat may have severe impacts on the taxon.

If this species is native to California, it appears to be encountered exceedingly rarely and is never reported. Given this complete uncertainty concerning its status and validity as a native element of the California fauna, we place this taxon on the Watch List, primarily to highlight research needs. Surveys for this taxon should be encouraged, although in the absence of additional data, specimen collection should be strictly limited to only what is needed to learn more about its natural history and status within the state. However, we emphasize that tissue samples might help determine if any California specimens are native or introduced.

Yellow-blotched ensatina

(*Ensatina eschscholtzii croceater*)

Ensatina eschscholtzii croceater occurs in a relatively small area of Kern and Ventura Counties in southern California. Some localized populations may have undergone declines or extirpations due to development, although data on this are scarce. Workers have expressed concerns about land use practices and development in the Tehachapi Mountains, Bear Valley, Cummings Valley, and Tejon Ranch, particularly in areas of oak woodlands (pers. comm. in Jennings and Hayes 1994a). One of the main concerns for this taxon was that a large fraction of its range occurs on property owned by the Tejon Ranch Company, the largest contiguous private landholding in California, and that this land would be developed in a way that was incompatible with the salamander's survival. Since the previous evaluation, a large fraction of Tejon Ranch has been set aside for preservation—areas in which grazing, but not development, may continue (Tejon Ranch Conservancy 2008). In addition, many populations occur on National Forest and other public lands that are unlikely to experience intense habitat modification. The availability of suitable habitat should be monitored periodically, and habitat modification within its very restricted range should be avoided.

Southern California mountain kingsnake

(*Lampropeltis zonata* "Southern Clade" or *L. multifasciata*)

The southern clade of *L. zonata* includes the formerly recognized subspecies *L. z. pulchra* and *L. z. parvirubra* (Rodríguez-Robles et al. 1999b), and has more recently been recognized at the species level as *L. multifasciata* (Myers et al. 2013). This snake specializes on rocky outcrop habitats occurring primarily in a variety of woodland and chaparral habitats from sea level to nearly 3000 m (Stebbins 2003). It is a popular species among herpetoculturists and collectors, and some have voiced concerns that habitat destruction has caused localized declines. Overzealous collection of this snake does tend to destroy the microhabitats within rocks, which can degrade the quality of sites for a long period of time, although the species exhibits a relatively narrow window of surface activity, and much of its habitat may be relatively inaccessible to collectors. Staub and Mulks (2009) surveyed the Mount Laguna region, San Diego County, from 2006 to 2008 and found that 75% of all rock piles surveyed had some degree of damage. They concluded that collecting is ongoing and is not restricted to the vicinity of roads, supporting the concerns that the intensity of ongoing collecting could harm this species. Managers should be wary of signs of habitat destruction, stemming from either collectors or other sources, particularly in areas that experience heavy human traffic such as Mount Laguna. If surveys demonstrate that these collecting activities are depleting populations, further management and enforcement of existing collecting prohibitions may be needed.

Del Norte salamander

(*Plethodon elongatus*)

Plethodon elongatus occurs from the California–Oregon border south into Humboldt and Trinity Counties. Optimal habitat for this taxon appears to be late-successional and mature forests, which may be increasingly impacted by timber harvest in the coming years (Welsh and Lind 1995; H. Welsh, pers. comm.). Prior to 2002, this species was managed under the Northwest Forest Plan (Welsh and Bury 2005, Survey and manage program 2010). These protections have now been removed, although much of the habitat that supports this taxon remains protected under the Plan (Northwest Forest Plan 1994). Monitoring efforts should focus on the impact of timber harvest on this species' ability to persist, particularly at inland sites.

Western black-headed snake

(*Tantilla planiceps*)

The natural history of *T. planiceps* is poorly understood in California. We have almost no information concerning this species' natural history, habitat requirements, or population densities. The snake seems to be patchily distributed and rarely seen, making the detection of population declines or extirpations difficult. In addition, much of its range occurs in areas that have experienced heavy development and habitat modification. Some workers have

suggested that changing wildfire regimes in southern California could be having a negative impact on this species; however, relevant data are very sparse. An important priority for this taxon is an increased research effort focused on distribution and habitat surveys so that its ecological requirements and population dynamics can be better characterized. As populations are discovered, tissue samples should be collected for molecular analyses of the degree of isolation and differentiation of these apparently disjunct populations.

Baja California night lizard

(*Xantusia wigginsi*)

Xantusia wigginsi was not known to be a part of the California lizard fauna until recent genetic studies established its presence in extreme southern California (Leavitt et. al. 2007). Virtually nothing is known about this taxon's range, life history, habitat requirements, or conservation status within California. Further research on this species is needed before assessments of its conservation status and management needs can be made.

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GLOSSARY

ADPRESSED LIMBS Position of the limbs such that the forelimbs are pressed backwards against the trunk of the animal, and the hind limbs are pressed forward against the trunk. The distance between adpressed limbs, a character which measures the relative limb length with respect to the trunk length, is usually best measured in preserved specimens, since the limbs may be damaged in living animals.

ALLOPATRIC Occurring in separate areas; refers to species ranges that do not overlap

ALLOZYME Alleles of an enzyme that vary in their speed of migration through an electrophoretic gel. A common way to quantify genetic variation before DNA sequencing became routine.

AMPLEXUS Mating behavior in many aquatic anurans and some salamanders in which the male grasps the female with the front legs.

BD *Batrachochytrium dendrobatidis*. A pathogenic fungus that causes the disease chytridiomycosis in many amphibians.

CARAPACE The dorsal half of a turtle shell.

COSTAL GROOVES Lateral indentations along the trunk of many salamanders.

CRITICAL THERMAL MAXIMUM The temperature above which a given species ceases to be able to maintain normal body function. Extended temperatures above this point generally lead to death.

CRITICAL THERMAL MINIMUM The temperature below which a given species ceases to be able to maintain normal body function. Extended temperatures below this point generally lead to death.

CRYPTIC TAXA Evolutionarily distinct lineages that are morphologically conserved and are difficult to distinguish from one another on the basis of morphology alone.

DIAPAUSE A delay in the life cycle of an organism, often occurring in response to adverse environmental conditions.

DORSOLATERAL FOLDS Ridges of the skin that run along either side of the back in many frogs.

EXTANT A taxon that is still in existence, opposite of extinct.

HIBERNACULUM A place used by one or more individuals to hibernate or undergo a period of dormancy. Frequently used to refer to areas that house many hibernating individuals of the same species, especially sites that are used repeatedly over many years. The plural is hibernacula.

INTROGRESSION Transfer of genetic molecules from one species to another. In our usage, this most commonly refers to the transfer of the mitochondrial genome among species due to hybridization.

ISOLATION BY DISTANCE The genetic signature that tends to arise from the tendency of individuals within a population to mate with nearby

individuals, eventually leading to the gradual accumulation of genetic differentiation across the landscape.

KEELED A spine or ridge structure that runs along the central axis of a scale or scute.

LATE-SERAL Used to describe forests that are in a later stage of succession. Typified by the presence of large, old (>100 years) trees in the overstory.

MICROSATELLITE Short repetitive regions in the DNA that often exhibit a large amount of variation due to the very high rate of mutation in these regions of the genome. Frequently employed to measure population genetic variation within species, because their high mutation rate allows them to track changes in gene flow and population size quickly.

MTDNA An abbreviation for mitochondrial DNA, the separate chromosome found in the mitochondria of all plants and animals. Until recently, it has been the standard molecule of choice for most systematic, population genetic, and phylogeographic research.

NASOLABIAL GROOVES Characteristic grooves that run from each naris (external nostril) down to the upper lip in plethodontid salamanders.

NUCHAL Relating to or lying in the region of the nape.

OCELLUS An eye-like spot.

OVIPAROUS A mode of reproduction in which embryos develop inside of eggs.

OVOVIVIPAROUS A mode of reproduction in which embryos develop inside of eggs which are retained in the mother's body until hatching.

PAEDOMORPHOSIS The retention of larval traits into adulthood. In ambystomatid and dicamptodontid salamanders, it is also used to refer to reproduction in the larval condition.

PARAPHYLETIC A group of taxa, all descending from of a common ancestor, that does not contain all descendants of that ancestor. For examples, "reptiles" as traditionally defined are paraphyletic because they do not contain birds as a contained taxon.

PARATOID GLANDS External skin glands that lie along the back of the head or neck region and are prominent in most toads and several species of salamander.

PCA Principle component analysis. A multivariate ordination approach that reduced the variability among large sets of measured variables down to a (usually) smaller number of independent (orthogonal) variables.

PIT TAG Passive integrated transponder tag. A small injectable tag that emits a unique electronic signal that can be read using specialized instruments. A frequently used method for uniquely labeling individual organisms in a population.

PLASTRON The ventral part of a turtle shell.

POLYTYPIC Having several morphological forms. These may or may not correspond to evolutionary lineages.

POND TYPE LARVAE Salamander larvae that develop in ponds are characterized by having relatively large long fins associated with a relatively strong swimming ability.

SCUTE An enlarged scale, such as those on a turtle shell.

SCL Straight carapace length. The distance from the anterior to the posterior end of the carapace taken along the midline and measured as a straight distance (i.e., not measuring along the curvature of the shell). A standard way of measuring body length in turtles.

SNP Single nucleotide polymorphism. A homologous nucleotide position in a DNA sequence that is variable among conspecific individuals. SNPs are increasingly used instead of allozymes, microsatellites, and mtDNA for population genetic and species delimitation studies.

STREAM TYPE LARVAE Salamander larvae that develop in streams are typically smaller than pond type larvae and have smaller tail fins. Behaviorally, they tend not to swim in the open water and instead remain near the substrate.

SVL Snout to vent length. The distance from the tip of the snout to the anterior edge of the cloaca. A standard way of measuring length in many amphibians and reptiles.

TL Total length. The distance from the tip of the snout to the end of the tail.

VIVIPAROUS A mode of reproduction in which females give birth to live young that are not retained in shelled eggs (compare with ovoviviparous).

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Note: Page number followed by (f), (m), and (t) indicates figure, map, and table respectively.


COUNTIES AND ISLANDS
OF CALIFORNIA
124°0'0"W
120°0'0"W
116°0'0"W
41°0'0"N
37°0'0"N
33°0'0"N
Del Norte
Siskiyou
Modoc
Trinity
Shasta
Humboldt
Lassen
Tehama
Plumas
Mendocino
Glenn
Butte
Sierra
Nevada
Lake
Colusa
Yuba
Sutter
Placer
Sonoma
Yolo
Napa
El Dorado
Sacramento
Amador
Alpine
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San Francisco
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