THE DISTRIBUTION, HABITAT, AND STATUS OF THE VALLEY ELDERBERRY LONGHORN BEETLE DESMOCERUS CALIFORNICUS DIMORPHUS FISHER (INSECTA: COLEOPTERA: CERAMBYCIDAE)

Cheryl B. Barr U. S. Fish and Wildlife Service 2800 Cottage Way, Room E-1823 Sacramento, California 95825-1846

November 1991

Table of Contents

SUMMARY	1
INTRODUCTION	3
TAXONOMY	3
DISTRIBUTION	3
LIFE HISTORY	4
HABITAT	5
FEDERAL PROTECTION	6
PREVIOUS STUDIES, 1984-1991	6
CURRENT STUDY	8
MATERIALS AND METHODS	9
	•
SURVEY AREA	9
DOCUMENTATION	9
	LO
•	ιo
Valley Elderberry Longhorn Beetle 1	l 2
RESULTS AND DISCUSSION	L 5
PREVIEW 1	15
DISTRIBUTION	l 6
Limits of the Range 1	l 6
North 1	l 6
South 1	l 6
East]	l 6
	17
	18
Sacramento River 1	18
Sierra Nevada Drainages	20
Coast Range Drainages 2	24
	26
Sacramento River 2	27
San Joaquin River 2	27
The San Joaquin Valley 2	28
San Joaquin River 2	
Sierra Nevada Drainages 2	
Atypical Males 3	36

HABITAT	36
Species of Sambucus Utilized as Hosts	36
Sambucus Physical Characteristics and Condition	
Growth Form and Phenology	37
Size	38
Healthy and Stressed	39
Damage Due to Human Activities	40
Sambucus Habitat and Plant Communities	40
Sambucus Density	41
EXIT HOLES	42
Field Observations	42
Branch or Trunk Diameter at Exit Hole	43
Vertical Height of Exit Hole	44
Sambucus Wood Samples	44
ADULT BEETLES	45
Field Observations	45
Scarcity of Adult Collections	45
Laboratory Observations	46
POPULATION STATUS	
OWNERSHIP OF HABITAT	
	•
CONCLUSIONS	49
PROJECT SUMMARY	49
Overview	_
Sambucus with Valley Elderberry Longhorn	
Beetle Populations	50
Valley Elderberry Longhorn Beetle	
FACTORS AFFECTING THE VALLEY ELDERBERRY	
LONGHORN BEETLE	52
RECOVERY	
RECOMMENDATIONS	
	•
ACKNOWLEDGMENTS	57
REFERENCES	50

FIGURES	65
TABLES	108
APPENDIX I	113
SURVEY SITES	113
APPENDIX II	131
SAMBUCUS DETERMINATIONS	131 131
(Rydh.) Kearney & Peebles	133

List of Figures

- Figure 1. Male Desmocerus californicus dimorphus collected near the Mokelumne River north of Clements, San Joaquin Co., 15 May 1991 (Site #72).
- Figure 2. Female Desmocerus californicus dimorphus collected at the Campbell-Moreland Ditch just southeast of Porterville, Tulare Co., 21 April 1991 (Site #15).
- Figure 3. Known geographic ranges of: 1, Desmocerus californicus californicus Horn (closed circles); 2, D. californicus dimorphus Fisher (open circles). (From Linsley & Chemsak 1974)
- Figure 4. Sambucus stem sectioned longitudinally to expose VELB gallery; note frass and shredded wood (Site #32).
- Figure 5. Sambucus stem sectioned longitudinally to expose VELB gallery; note frass and shredded wood (Site #32).
- Figure 6. Recent VELB exit hole (Site #141).
- Figure 7. Recent VELB exit hole (Site #24).
- Figure 8. Distribution of survey sites with Desmocerus californicus dimorphus and/or Sambucus present.
- Figure 9. Lanky arborescent Sambucus racemosa var. microbotrys at Reading Island Recreation Area (BLM) campsite on the Sacramento River, Shasta Co. (Site #61); note the pruning scars and absence of bark on much of the trunk.
- Figure 10. Massive arborescent Sambucus, with a maximum trunk diameter of 30 inches, adjacent to Bartlett Park (Co.) on the Tule River east of Porterville, Tulare Co. (Site #35); the tree had been pruned.
- Figure 11. Sambucus in full bloom above Lake Kaweah (COE), Hwy. 198, Tulare Co. (Site #33).
- Figure 12. Dense Sambucus grove along Gordon Valley Creek about 4 mi. northwest of Fairfield, Solano Co. (Site #125).
- Figure 13. Clean-cut, typical VELB exit hole (Site #56).

- Figure 14. Partly healed VELB exit hole (Site #61).
- Figure 15. Healed VELB exit hole (Site #32).
- Figure 16. Possible VELB exit holes plugged with sawdust/frass from secondary insect infestation, perhaps by termites (Site #32).
- Figure 17. Enlarged holes with extruded sawdust/frass from recent non-VELB insect activity (Site #20).
- Figure 18. Enlarged hole with extruded sawdust/frass from recent non-VELB insect activity (Site #20).
- Figure 19. Known range of Desmocerus californicus dimorphus Fisher from current and historic adult/exit hole records.
- Figure 20. Sambucus mexicana grove with VELB exit holes at Turtle Bay East Fishing Access (city) on the Sacramento River, Redding, Shasta Co. (Site #56).
- Figure 21. Sambucus clump with VELB exit holes at Anderson River Park (city) on the Sacramento River, Shasta Co. (Site #60).
- Figure 22. Sambucus racemosa var. microbotrys grove with VELB exit holes at the margin of riparian forest along the Sacramento River, Sacramento River NWR (Flynn Tract) southeast of Gerber, Tehama Co. (Site #112).
- Figure 23. Large Sambucus racemosa var. microbotrys clump with VELB exit holes at the margin of a dense riparian corridor along the Sacramento River, Kopta Slough Preserve (The Nature Conservancy) east of Corning, Tehama Co. (Site #113).
- Figure 24. Grove of buckeye, oak, and Sambucus racemosa var. microbotrys with VELB exit holes above Paynes Creek, Tehama Co. (Site #68).
- Figure 25. Riparian Sambucus mexicana with VELB exit holes along Big Chico Creek in Bidwell Park (city), Chico, Butte Co. (Site #119).
- Figure 26. Sambucus racemosa var. microbotrys with VELB exit holes along the Feather River levee east of Live Oak, Yuba Co. (Site #172).
- Figure 27. Huge, isolated Sambucus racemosa var. microbotrys with VELB exit holes below Black Butte Lake Dam, Tehama Co. (Site #118).

- Figure 28. Recent exit hole in Sambucus mexicana branch, Wooden Valley Creek northwest of Fairfield, Napa Co. (Site #128).
- Figure 29. Dense stand of Sambucus in bloom along a tributary of Ledgewood Creek northwest of Fairfield, Solano Co. (Site #123).
- Figure 30. Large clump of Sambucus with numerous VELB exit holes along the Calaveras River north of Linden, San Joaquin Co. (Site #93).
- Figure 31. Massive old Sambucus with possible VELB exit holes above the Kings River west of Reedley, Fresno Co. (Site #43).
- Figure 32. Sambucus racemosa var. microbotrys with numerous VELB exit holes; Campbell-Moreland Ditch (tributary Tule River) just southeast of Porterville, Tulare Co. (Site #15).
- Figure 33. Large clump of Sambucus with VELB exit holes at the margin of the riparian corridor along the Tule River east of Porterville, Tulare Co. (Site #20).
- Figure 34. The size distribution of maximum diameters of all Sambucus groups compared to those with VELB exit holes.
- Figure 35. The health of all *Sambucus* groups compared to those with VELB exit holes.
- Figure 36. Recently pruned Sambucus adjacent to Bartlett Park (Co.) on the Tule River, Tulare Co. (Site #35); VELB exit holes were present.
- Figure 37. Recently cut Sambucus logs at Reading Island Recreation Area (BLM) campsite on the Sacramento River, Shasta Co. (Site #61); VELB exit holes were present.
- Figure 38. Cutting damage to Sambucus at McHenry Avenue Park (COE) picnic area on the Stanislaus River, San Joaquin Co. (Site #223); VELB exit holes were present.
- Figure 39. Old, splintered Sambucus stems and trunks surrounded by young shoots (Site #89).
- Figure 40. Burned Sambucus grove (Site #210).
- Figure 41. Burn scars on Sambucus trunk (Site #205).
- Figure 42. Riparian Sambucus racemosa var. microbotrys stand, elevation ~85 ft., at Honcut Creek northeast of Live Oak, Yuba Co. (Site #173).

- Figure 43. Elderberry savanna with huge Sambucus racemosa var.

 microbotrys, elevation ~365 ft., at Reading Island

 Recreation Area (BLM) on the Sacramento River, Shasta Co.

 (Site #61).
- Figure 44. Isolated Sambucus racemosa var. microbotrys clump in a pasture bordering Paynes Creek, elevation ~1875 ft., Tehama Co. (Site #67).
- Figure 45. Fencerow Sambucus mexicana with cemetery on the left and plowed field on the right, elevation ~135 ft., near the Mokelumne River north of Clements, San Joaquin Co. (Site #72); a female VELB was captured on this clump on 15 May 1991.
- Figure 46. Sambucus mexicana in an oak-woodland habitat, elevation ~780 ft.; the plants were growing in a damp roadside ditch at the Peninsula Campground entrance, Folsom Lake State Recreation Area, El Dorado Co. (Site #99).
- Figure 47. Sambucus mexicana in a mixed chaparral-foothill woodland habitat, elevation ~520 ft., Cache Creek Canyon, Yolo Co. (Site #75); plant associates included toyon, manzanita, redbud, digger pine, and big-leaf maple.
- Figure 48. Sambucus racemosa var. microbotrys growing amid boulders on a rocky hill, elevation ~410 ft., near Miners Ravine west of Folsom Lake, Placer Co. (Site #21).
- Figure 49. Dense Sambucus grove in a dry, incised streambed southwest of Caliente, Kern Co., elevation ~1360 ft. (Site #6).
- Figure 50. Elderberry density at all sites compared to those with VELB exit holes.
- Figure 51. The age/condition of VELB exit holes examined in live and dead wood.
- Figure 52. The size distribution of branch/trunk diameters at VELB exit holes.
- Figure 53. VELB gallery and exit hole in a 0.7 inch diameter dead branch (Site #78); note the large percentage of pith.
- Figure 54. VELB gallery in a 0.6 inch diameter dead branch (Site #75); note the large percentage of pith.
- Figure 55. Distribution of the heights of VELB exit holes above the ground.

- Figure 56. Sectioned branch with probable VELB gallery damaged by a secondary invasion of other insects, possibly ants (Site #60).
- Figure 57. Sectioned branch with probable VELB gallery nearly obliterated by a secondary invasion of other insects (Site #145).
- Figure 58. Sectioned old branch with external holes resembling those of the VELB, but without a recognizable VELB gallery; the dead wood was probably mined by carpenter ants (Site #9/10).
- Figure 59. Cut stump with tunnels probably created by carpenter ants (Site #15).
- Figure 60. Sectioned branch with galleries and exit holes of bostrichid beetles and termites (Site #6).
- Figure 61. Sectioned branch with galleries and exit holes of termites (Site #12).
- Figure 62. An adult female VELB was captured on 21 April 1991 on this Sambucus racemosa var. microbotrys at the Campbell-Moreland Ditch (tributary Tule River) near Porterville, Tulare Co. (Site #15).
- Figure 63. Dead adult male VELB in exit tunnel, 30 April 1991, near Lane Slough (tributary Kaweah River) north of Exeter, Tulare Co. (Site #32).
- Figure 64. Clump of Sambucus mexicana with dead male VELB and numerous exit holes, near Lane Slough (tributary Kaweah River) north of Exeter, Tulare Co. (Site #32).
- Figure 65. An adult male VELB was captured on 15 May 1991 on this Sambucus mexicana near the Mokelumne River north of Clements, San Joaquin Co. (Site #72).
- Figure 66. Mating pair of Desmocerus californicus dimorphus captured separately near the Mokelumne River north of Clements, San Joaquin Co., 15 May 1991 (Site #72); they began mating in captivity after being placed together.

List of Tables

- Table 1. The presence/absence of elderberry and valley elderberry longhorn beetle populations in parks, wildlife areas, or public lands in the Central Valley and adjacent foothills based on current and historic records.
- Table 2. Total acreage of parks, wildlife areas, and public land in the Central Valley and adjacent foothills with known current and historic populations of the valley elderberry longhorn beetle and/or elderberry (summation of Table 1).