

Article

Riparian Forest Restoration: Conflicting Goals, Trade-Offs, and Measures of SuccessHeather L. Bateman ^{1,*}, David M. Merritt ² and J. Bradley Johnson ³¹ Arizona State University, Polytechnic Campus, 6073 S Backus Mall, Mesa, AZ 85212, USA² USFS Watershed, Fish, and Wildlife & CSU Natural Resource Ecology Laboratory NRRC, Fort Collins, CO 80526, USA; E-Mail: dmmerritt@fs.fed.us³ Colorado State University, Department of Biology, Fort Collins, CO 80526, USA; E-Mail: bjohnson@lamar.colostate.edu

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Supplementary Material

Table 1. Species of amphibians and reptiles documented in the riparian forest and associated habitats (including ditches, canals, ponds, sandbars, and drier peripheral riparian habitat) of the Middle Rio Grande, New Mexico. An “X” indicates a species was encountered during the Rocky Mountain Research Station (RMRS) restoration project from 2000 to 2006 or from historical records. In the RMRS columns subscripts indicate the number of sites where the species occurred and superscripts indicate the number sites where the species was “gained”. Letter superscripts found in the historic column represent the reference, which are listed below.

Taxa	Scientific Name	Common Name	RMRS Pre	RMRS Post	Historic
Amphibians					
	<i>Ambystoma tigrinum</i>	Tiger Salamander	X ₁	X ₂ ¹	X ^{M, H, D, S}
	<i>Bufo cognatus</i>	Great Plains Toad	X ₂	X ₈ ⁶	X ^{M, H, D}
	<i>Bufo punctatus</i>	Red-spotted Toad		X ₁ ¹	X ^{HM}
	<i>Bufo woodhousii</i>	Woodhouse's Toad	X ₁₂	X ₁₂	X ^{M, H, D, S}
	<i>Pseudacris triseriata</i>	Western Chorus Frog	X ₁ ¹		X ^{M, H, D}
	<i>Rana blairi</i>	Plains Leopard Frog			X ^M
	<i>Rana catesbeiana</i> *	American Bullfrog	X ₁	X ₂ ²	X ^{M, H, D}
	<i>Rana pipiens</i>	Northern Leopard Frog			X ^{M, HM, D}
	<i>Scaphiopus couchii</i>	Couch's Spadefoot	X ₆	X ₉ ³	X ^{M, HM, D}
	<i>Spea bombifrons</i>	Plains Spadefoot	X ₁ ¹	X ₁ ¹	X ^{M, H}

Table 1. Cont.

Taxa Scientific Name	Common Name	RMRS Pre	Post	Historic
<i>Spea multiplicata stagnalis</i>	New Mexico Spadefoot	X ₆	X ₇ ¹	X ^{M, HM, D}
Turtles				
<i>Apalone spinifera</i>	Spiny Softshell Turtle	X ₁ ¹		X ^{M, H, D}
<i>Chelydra serpentina serpentina</i>	Eastern Snapping Turtle			X ^{M, D}
<i>Chrysemys picta</i>	Painted Turtle			X ^{M, HM, D}
<i>Terrapene ornata</i>	Ornate Box Turtle			X ^{M, HM, D}
<i>Trachemys gaigeae gaigeae</i>	Big Bend Slider			X ^D
<i>Trachemys scripta elegans</i>	Red-eared Slider			X ^{M, D}
Lizards				
	Chihuahuan Spotted Whiptail	X ₁₁	X ₁₂ ¹	
<i>Aspidoscelis exsanguis</i>	Whiptail			X ^{H, D, S}
<i>Aspidoscelis inornata</i>	Little Striped Whiptail	X ₁	X ₁	X ^{H, D, S}
<i>Aspidoscelis neomexicana</i>	New Mexico Whiptail	X ₁₂	X ₁₂	X ^{M, H, D}
	Common Checkered Whiptail	X ₂	X ₂	
<i>Aspidoscelis tessellata</i>	Whiptail			X ^{HM, D}
<i>Aspidoscelis tigris</i>	Tiger Whiptail	X ₁	X ₁	X ^{M, HM}
	Desert Grassland Whiptail	X ₆ ¹	X ₆ ¹	
<i>Aspidoscelis uniparens</i>	Whiptail			X ^{M, HM, D, S}
<i>Aspidoscelis velox</i>	Plateau Striped Whiptail			X ^H
<i>Cophosaurus texanus</i>	Greater Earless Lizard			X ^D
<i>Crotaphytus collaris</i>	Collared Lizard			X ^D
<i>Crotaphytus wislizeni</i>	Leopard Lizard			X ^M
<i>Eumeces obsoletus</i>	Great Plains Skink	X ₁₀	X ₁₀	X ^{M, H, D, B}
	Common Lesser Earless Lizard			
<i>Holbrookia maculata</i>	Lizard			X ^H
	Greater Short-horned Lizard			
<i>Phrynosoma hernandesi</i>	Lizard			X ^{HM}
<i>Phrynosoma cornutum</i>	Texas Horned Lizard		X ₁ ¹	
	Pygmy Short-Tailed Horned Lizard			
<i>Phrynosoma douglasii</i>	Horned Lizard			X ^M
	Round-tailed Horned Lizard			
<i>Phrynosoma modestum</i>	Lizard			X ^{M, H, D}
<i>Sceloporus clarkii</i>	Clark's Spiny Lizard			X ^M
<i>Sceloporus magister</i>	Desert Spiny Lizard	X ₁	X ₁	X ^{M, HM, D}
	Southwestern Fence Lizard	X ₉ ¹	X ₁₁ ³	
<i>Sceloporus cowlesi</i>	Lizard			X ^{M, H, D, S}
<i>Urosaurus ornatus</i>	Ornate Tree Lizard			X ^D
	Common Side-blotched Lizard	X ₂	X ₂	
<i>Uta stansburiana</i>	Lizard			X ^{M, H, D}

Table 1. Cont.

Taxa Scientific Name	Common Name	RMRS Pre	Post	Historic
Snakes				
<i>Arizona elegans</i>	Glossy Snake		X ₂ ²	X ^{M, H}
<i>Coluber constrictor</i>	Eastern Racer		X ₁ ¹	X ^{HM, D}
	Western		X ₃ ³	
	Diamond-backed			
<i>Crotalus atrox</i>	Rattlesnake			X ^{M, HM}
<i>Crotalus viridis</i>	Prairie Rattlesnake		X ₃ ³	X ^{M, HM}
	Western Hog-nosed Snake	X ₃ ¹	X ₄ ²	
<i>Heterodon nasicus</i>	(Texas) Night Snake			X ^{HM}
<i>Hypsiglena torquata</i>	Common Kingsnake			X ^M
<i>Lampropeltis getula</i>	New Mexico	X ₆	X ₈ ²	X ^{M, HM, D, S}
	Threadsnake			X ^D
<i>Leptotyphlops dissectus</i>	Coachwhip	X ₃ ³	X ₂ ²	X ^{M, HM}
<i>Masticophis flagellum</i>	Gophersnake	X ₅ ²	X ₆ ³	X ^{M, HM, D}
<i>Pituophis catenifer</i>	Long-nosed Snake			X ^{M, HM}
<i>Rhinocheilus lecontei</i>	Massasauga			X ^{HM}
	Plains Black-headed Snake	X ₂ ¹	X ₅ ⁴	
<i>Tantilla nigriceps</i>	Black-necked Gartersnake			X ^{M, HM, S}
<i>Thamnophis cyrtopsis</i>	Terrestrial Gartersnake			X ^{HM, D}
<i>Thamnophis elegans</i>	Checkered Gartersnake	X ₁ ¹		X ^{M, D}
<i>Thamnophis marcianus</i>	Common Gartersnake	X ₁	X ₂ ¹	X ^{M, HM, D}
<i>Thamnophis sirtalis</i>		X ₃	X ₄ ¹	X ^{M, HC, D}

Reference codes are as follows: H = captured by Hink and Ohmart [1], HM = museum records and other observations reported in Hink and Ohmart [1] Appendix 2, D = habitat associations from Degenhardt *et al.* [2], S = captures by Stuart *et al.* [3] at BDANWR. M = Museum of Southwestern Biology georeferenced data from a 400 m buffer around the Rio Grande in Bernalillo, Valencia, and Socorro Counties, 705 records (1938–1995);

* Species considered non-native, introduced.

References

1. Hink, V.C.; Ohmart, R.D. *Middle Rio Grande Biological Survey*; Final Report to the U.S. Army Corps of Engineers Contract No. DACW47-81-C-0015; Center for Environmental Studies, Arizona State University: Tempe, AZ, USA, 1984; p. 193.
2. Degenhardt, W.G.; Painter, C.W.; Price, A.H. *Amphibians and Reptiles of New Mexico*; University of New Mexico Press: Albuquerque, NM, USA, 1996.
3. Stuart, J.N.; Farley, G.H.; Valdez, E.W.; Bogan, M.A. *Studies of Vertebrates in Selected Riparian and Aquatic Habitats on Bosque del Apache National Wildlife Refuge, New Mexico*; U.S. Fish and Wildlife Service: Albuquerque, NM, USA, 1995.