

David A. Pike, Ligia Pizzatto, Brian A. Pike, and Richard Shine. 2008. Estimating survival rates of uncatchable animals: the myth of high juvenile mortality in reptiles. *Ecology* 89:607-611.

Appendix B: List of species with associated demographic data used in our analysis of juvenile survival rates of lizards, snakes, and turtles. If ranges of data were given for a single population we used the median value for analysis. When more than one literature source provided data on a single species in different locations we used each population in the analysis, and multiple entries for a single species correspond to the different populations. The number of eggs per year (annual reproductive output) was calculated by multiplying the mean number of clutches per year by the mean number of eggs per clutch. Juvenile survival to adulthood and annual juvenile survival were calculated using the model presented in Online Appendix A. Literature sources for all data follow the table.

Type	Species	Clutch size	Clutches/year	Female age at maturity	Adult survival rate	Eggs/year	Juvenile survival to adulthood	Annual juvenile survival	Reproductive mode	Female size at maturity (mm)	Size at hatching (mm)
lizard	<i>Basiliscus basiliscus</i>	9.5	6	1.7	0.33	56.9	0.024	0.11	Oviparous	135	42
lizard	<i>Cnemidophorus sexlineatus</i>	2.1	2	2.0	0.16	4.2	0.400	0.63	Oviparous	68	32
lizard	<i>Cnemidophorus tigris</i>	4.1	1.5	1.8	0.40	6.2	0.195	0.41	Oviparous	70	37
lizard	<i>Cnemidophorus tigris</i>	2.0	1.5	1.0	0.48	3.0	0.347	0.35	Oviparous	83	37.5
lizard	<i>Cnemidophorus tigris</i>	2.1	1.1	1.8	0.55	2.3	0.399	0.61	Oviparous	70	39
lizard	<i>Cnemidophorus uniparens</i>	2.8	2.5	0.8	0.08	6.9	0.266	0.20	Oviparous	58	36
lizard	<i>Crotaphytus collaris</i>	7.6	1	0.8	0.48	7.6	0.138	0.09	Oviparous	78	42
lizard	<i>Crotaphytus wislizeni</i>	7.6	1	1.8	0.50	7.6	0.132	0.33	Oviparous	103	44.6
lizard	<i>Cyclura carinata</i>	4.3	1	6.5	0.90	4.3	0.047	0.62	Oviparous	192	80
lizard	<i>Holbrookia maculata</i>	3.5	2	1.0	0.40	7.0	0.171	0.17	Oviparous	44	24.5
lizard	<i>Lacerta vivipara</i>	7.7	1	1.5	0.20	7.7	0.207	0.35	Viviparous	49	21
lizard	<i>Phrynosoma douglasi</i>	16.0	1	2.0	0.67	16.0	0.041	0.20	Viviparous	60	24
lizard	<i>Sceloporus graciosus</i>	3.8	2	1.9	0.50	7.6	0.132	0.33	Oviparous	48.6	25.1
lizard	<i>Sceloporus graciosus</i>	3.8	2	1.8	0.47	7.6	0.139	0.34	Oviparous	48.6	25.1

lizard	<i>Sceloporus graciosus</i>	3.8	1	2.0	0.47	3.8	0.279	0.52	Oviparous	53	25.1
lizard	<i>Sceloporus graciosus</i>	3.8	1	2.0	0.47	3.8	0.279	0.52	Oviparous	53	25.1
lizard	<i>Sceloporus jarrovi</i>	7.0	1	0.7	0.36	7.0	0.183	0.07	Viviparous	73	29
lizard	<i>Sceloporus poinsetti</i>	10.4	1	1.4	0.43	10.4	0.110	0.20	Viviparous	87	32
lizard	<i>Sceloporus scalaris</i>	8.4	1	0.7	0.30	8.4	0.167	0.09	Oviparous	41	21
lizard	<i>Sceloporus undulatus</i>	9.9	4	1.0	0.20	39.6	0.040	0.04	Oviparous	53	28
lizard	<i>Sceloporus undulatus</i>	8.3	3	1.0	0.49	24.9	0.041	0.04	Oviparous	55	25
lizard	<i>Sceloporus undulatus</i>	8.0	3	1.0	0.49	24.0	0.043	0.04	Oviparous	55	28
lizard	<i>Sceloporus undulatus</i>	7.2	3	2.0	0.48	21.6	0.048	0.22	Oviparous	60	25
lizard	<i>Sceloporus undulatus</i>	11.8	2	1.7	0.37	23.6	0.053	0.18	Oviparous	58	27
lizard	<i>Sceloporus undulatus</i>	9.5	2	1.7	0.44	19.0	0.059	0.19	Oviparous	66	23
lizard	<i>Sceloporus undulatus</i>	7.9	2.5	1.0	0.30	19.8	0.071	0.07	Oviparous	55	25
lizard	<i>Sceloporus undulatus</i>	7.0	3	1.0	0.11	21.0	0.085	0.08	Oviparous	47	25
lizard	<i>Sceloporus undulatus</i>	7.4	2	1.0	0.34	14.8	0.089	0.09	Oviparous	53	22
lizard	<i>Sceloporus undulatus</i>	6.3	2	1.0	0.27	12.6	0.116	0.12	Oviparous	47	23
lizard	<i>Sceloporus undulatus</i>	5.6	2	0.9	0.13	11.1	0.157	0.13	Oviparous	60	25
lizard	<i>Sceloporus virgatus</i>	9.5	1	1.8	0.50	9.5	0.105	0.29	Oviparous	47	21.5

lizard	<i>Sceloporus virgatus</i>	9.5	1	1.8	0.47	9.5	0.112	0.30	Oviparous	47	21.5
lizard	<i>Sceloporus virgatus</i>	9.5	1	1.8	0.44	9.5	0.118	0.31	Oviparous	47	21.5
lizard	<i>Takydromus tachydromoides</i>	4.2	3	1.0	0.24	12.6	0.121	0.12	Oviparous	45	22
lizard	<i>Takydromus tachydromoides</i>	3.6	3	1.0	0.24	10.9	0.140	0.14	Oviparous	45	22
lizard	<i>Takydromus tachydromoides</i>	3.6	3	1.0	0.24	10.8	0.141	0.14	Oviparous	45	22
lizard	<i>Urosaurus ornatus</i>	9.0	2	3.8	0.30	18.0	0.078	0.51	Oviparous	41	21
lizard	<i>Urosaurus ornatus</i>	4.7	3	3.4	0.34	14.1	0.094	0.50	Oviparous	41	21
lizard	<i>Urosaurus ornatus</i>	5.3	3	3.3	0.23	15.9	0.097	0.49	Oviparous	41	24.5
lizard	<i>Urosaurus ornatus</i>	9.0	1.5	3.4	0.33	13.5	0.099	0.51	Oviparous	41	24.5
lizard	<i>Urosaurus ornatus</i>	4.2	1.5	3.3	0.28	6.4	0.226	0.64	Oviparous	41	21
lizard	<i>Uta stansburiana</i>	3.9	3.5	3.5	0.12	13.7	0.129	0.56	Oviparous	41	22
lizard	<i>Uta stansburiana</i>	3.3	4	3.4	0.11	13.3	0.134	0.55	Oviparous	41	22
lizard	<i>Uta stansburiana</i>	3.7	1	3.5	0.30	3.7	0.383	0.76	Oviparous	41	22
lizard	<i>Xantusia vigilis</i>	1.8	1	3.0	0.71	1.8	0.324	0.69	Viviparous	39	23
lizard	<i>Xantusia vigilis</i>	1.8	1	3.0	0.71	1.8	0.326	0.69	Viviparous	39	23
snake	<i>Agkistrodon contortrix</i>	5.5	0.5	3.0	0.71	2.7	0.212	0.60	Viviparous	420	220
snake	<i>Agkistrodon contortrix</i>	5.3	0.5	3.0	0.71	2.7	0.219	0.60	Viviparous	420	220

snake <i>Agkistrodon contortrix</i>	5.3	0.5	3.0	0.70	2.7	0.226	0.61	Viviparous	420	220
snake <i>Agkistrodon contortrix</i>	5.3	0.5	3.0	0.69	2.7	0.234	0.62	Viviparous	420	220
snake <i>Carphophis vermis</i>	3.0	1	3.0	0.65	3.0	0.234	0.62	Oviparous	250	114.5
snake <i>Carphophis vermis</i>	3.0	1	2.1	0.65	3.0	0.234	0.50	Oviparous	250	114.5
snake <i>Coluber constrictor</i>	11.8	1	2.0	0.62	11.8	0.064	0.25	Oviparous	580	214.5
snake <i>Coluber constrictor</i>	5.8	1	3.0	0.75	5.8	0.087	0.44	Oviparous	580	225.7
snake <i>Crotalus viridis</i>	9.7	1	7.0	0.85	9.7	0.031	0.61	Viviparous	564	245
snake <i>Crotalus viridis</i>	10.2	0.5	3.0	0.75	5.1	0.098	0.46	Viviparous	605	245
snake <i>Crotalus viridis</i>	5.5	0.4	7.0	0.85	2.2	0.136	0.75	Viviparous	650	245
snake <i>Cryptophis nigrescens</i>	4.2	1	3.0	0.74	4.2	0.123	0.50	Viviparous	285	152.3
snake <i>Diadophis punctatus</i>	3.9	1	3.0	0.74	3.9	0.133	0.51	Oviparous	235	111.5
snake <i>Diadophis punctatus</i>	3.9	1	2.8	0.60	3.9	0.205	0.56	Oviparous	235	111.5
snake <i>Elaphe quadrivirgata</i>	9.2	1	2.0	0.60	9.2	0.087	0.29	Oviparous	549	250
snake <i>Heterodon nasicus</i>	9.5	1	1.8	0.63	9.5	0.078	0.23	Oviparous	350	153
snake <i>Heterodon nasicus</i>	9.5	0.5	1.8	0.63	4.8	0.156	0.35	Oviparous	350	153
snake <i>Heterodon nasicus</i>	9.5	0.5	2.0	0.63	4.8	0.156	0.39	Oviparous	350	153
snake <i>Heterodon platirhinos</i>	19.1	1	2.0	0.47	19.1	0.055	0.24	Oviparous	560	234

snake <i>Heterodon platirhinos</i>	19.1	0.8	2.0	0.47	14.3	0.074	0.27	Oviparous	560	234
snake <i>Hoplocephalus bungaroides</i>	6.8	0.5	6.0	0.82	3.4	0.108	0.69	Viviparous	448	23.2
snake <i>Masticophis taeniatus</i>	5.8	1	3.0	0.80	5.8	0.069	0.41	Oviparous	740	287.5
snake <i>Nerodia sipedon</i>	22.6	1	2.0	0.35	22.6	0.058	0.24	Viviparous	470	184
snake <i>Opheodrys aestivus</i>	6.1	1	1.8	0.49	6.1	0.167	0.36	Oviparous	350	139
snake <i>Opheodrys aestivus</i>	6.1	1	2.0	0.49	6.1	0.167	0.41	Oviparous	350	139
snake <i>Opheodrys aestivus</i>	6.1	1	2.0	0.49	6.1	0.167	0.41	Oviparous	350	139
snake <i>Pituophis melanoleucus</i>	7.4	1	3.0	0.80	7.4	0.054	0.38	Oviparous	740	331.1
snake <i>Pituophis melanoleucus</i>	7.4	1	3.0	0.63	7.4	0.100	0.46	Oviparous	740	331.1
snake <i>Pituophis melanoleucus</i>	7.4	1	3.0	0.63	7.4	0.100	0.46	Oviparous	740	331.1
snake <i>Rhabdophis tigrinus</i>	12.9	1	2.0	0.41	12.9	0.091	0.30	Oviparous	548	168
snake <i>Thamnophis ordinoides</i>	9.5	1	2.0	0.50	9.5	0.105	0.32	Viviparous	527.2	139
snake <i>Thamnophis proximus</i>	8.4	1	2.0	0.50	8.4	0.119	0.35	Viviparous	527.2	139
snake <i>Thamnophis sirtalis</i>	14.5	1	1.8	0.50	14.5	0.069	0.22	Viviparous	504	167.9
snake <i>Thamnophis sirtalis</i>	11.3	1	2.0	0.50	11.3	0.088	0.30	Viviparous	504	185
snake <i>Thamnophis sirtalis</i>	16.4	0.5	2.0	0.50	8.2	0.122	0.35	Viviparous	504	154
snake <i>Vipera aspis</i>	7.0	0.5	4.5	0.75	3.5	0.143	0.65	Viviparous	463	200

snake	<i>Vipera aspis</i>	7.0	0.3	5.0	0.80	2.1	0.190	0.72	Viviparous	463	200
snake	<i>Vipera aspis</i>	7.0	0.3	5.5	0.78	1.8	0.251	0.78	Viviparous	400	200
snake	<i>Vipera berus</i>	7.9	0.5	3.0	0.77	4.0	0.116	0.49	Viviparous	450	144.5
snake	<i>Vipera berus</i>	7.5	0.5	3.0	0.77	3.8	0.123	0.50	Viviparous	450	195
turtle	<i>Caretta caretta</i>	120.0	1.5	20.0	0.81	180.0	0.002	0.73	Oviparous	651	43
turtle	<i>Chelodina longicollis</i>	2.0	1.5	10.0	0.98	30.0	0.001	0.52	Oviparous	170	29.8
turtle	<i>Chelonia mydas</i>	110.0	1.3	25.0	0.61	146.7	0.005	0.81	Oviparous	692	51
turtle	<i>Chelydra serpentina</i>	30.0	1	20.0	0.97	30.0	0.002	0.73	Oviparous	12.3	27.5
turtle	<i>Chrysemys picta</i>	13.0	2.5	9.0	0.96	32.5	0.002	0.51	Oviparous	107	26.9
turtle	<i>Chrysemys picta</i>	13.0	2.5	7.0	0.92	32.5	0.005	0.47	Oviparous	107	26.9
turtle	<i>Chrysemys picta</i>	11.5	2	8.0	0.76	23.0	0.021	0.62	Oviparous	107	26.9
turtle	<i>Geochelone gigantea</i>	2.0	9	23.0	0.97	18.0	0.003	0.78	Oviparous	550	70
turtle	<i>Gopherus agassizii</i>	5.5	1.5	16.0	0.94	8.3	0.015	0.77	Oviparous	189	42
turtle	<i>Gopherus polyphemus</i>	6.5	1	11.0	0.90	6.5	0.031	0.73	Oviparous	229	42
turtle	<i>Kinosternon flavescens</i>	5.0	2	11.0	0.95	10.0	0.010	0.66	Oviparous	102.5	21
turtle	<i>Kinosternon sonoriense</i>	3.5	2	7.0	0.94	7.0	0.017	0.56	Oviparous	93	24
turtle	<i>Kinosternon sonoriense</i>	3.5	2	7.0	0.86	7.0	0.040	0.63	Oviparous	93	24

turtle	<i>Kinosternon sonoriense</i>	3.5	2	7.0	0.83	7.0	0.049	0.65	Oviparous	93	24
turtle	<i>Kinosternon subrubum</i>	3.0	1	5.0	0.88	3.0	0.080	0.60	Oviparous	80	22
turtle	<i>Mauremys leprosa</i>	8.5	2	8.0	0.79	17.0	0.025	0.63	Oviparous	137.3	32
turtle	<i>Podocnemis voglii</i>	14.0	3	10.0	0.92	42.0	0.004	0.57	Oviparous	220	38.1
turtle	<i>Sternotherus odoratus</i>	3.5	3	5.0	0.84	10.5	0.030	0.50	Oviparous	75	21
turtle	<i>Terrapene ornata</i>	5.0	1	9.0	0.91	5.0	0.036	0.69	Oviparous	195	30
turtle	<i>Terrapene ornata</i>	5.0	1	11.0	0.83	5.0	0.068	0.78	Oviparous	118	30
turtle	<i>Testudo graeca</i>	11.5	2.5	12.0	0.88	28.8	0.008	0.67	Oviparous	141.4	32.5
turtle	<i>Trachemys scripta</i>	11.5	2.5	8.0	0.81	28.8	0.013	0.58	Oviparous	172.5	34

Data were compiled from the following sources:

Dunham, A. E., D. B. Miles, and D. N. Reznick. 1988. Life history patterns in squamate reptiles. Pages 441-522 in Gans, C., and R. B.

Huey, eds. Biology of the Reptilia. A. R. Liss, New York, USA.

Ernst, C. H., and R. W. Barbour. 1989. Turtles of the World. Smithsonian Institution Press, Washington D.C. USA.

Ernst, C. H., J. E. Lovich, and R. W. Barbour. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington D.C. USA.

Fitch, H.S. 1970. Reproductive cycles in lizards and snakes. University of Kansas Museum of Natural History Miscellaneous Publications **52**:1-247.

Pritchard, P. C. H., and P. Trebbau. 1984. The Turtles of Venezuela. Society for the Study of Amphibians and Reptiles Contributions to Herpetology.

Shine, R., and E. L. Charnov. 1992. Patterns of survival, growth and maturation in snakes and lizards. American Naturalist **139**:1257-1269.

Shine, R., and J. B. Iverson. 1995. Patterns of survival, growth and maturation in turtles. Oikos **72**:343-348.

Shine, R., and L. Schwarzkopf. 1992. The evolution of reproductive effort in lizards and snakes. Evolution **46**:62-75.

Webb, J. K., B. W. Brook, and R. Shine. 2002. What makes a species vulnerable to extinction? Comparative life history traits of two sympatric snakes. Ecological Research **17**:59-67.

Wright, A. H., and A. A. Wright. 1957. Handbook of Snakes of the United States and Canada. Cornell University Press, New York USA.