generally disperse after spring breeding, and reports of aggregations after breeding season are limited (see Pope and Matthews 2001. Copeia 2001:787–793; Pilliod et al. 2002. Can. J. Zool. 80:1849–1862; Bulger et al. 2003. Biol. Cons. 110:85–95). As our literature search yielded no direct observations of aggregations of Oregon Spotted Frogs (*Rana pretiosa*), we report an early fall aggregation of adult *R. pretiosa* at Penn Lake (UTM 586800 E, 4866800 N; elev. 1445 m) in the Cascade Mountains, Oregon, USA.

At 1500 h on 20 Sept 2002 (air temp. ca. 20°C), we observed an adult *R. pretiosa* in shallow water dive beneath the edge of a large, flat boulder (2 m × 1 m × 0.4 m). We lifted the boulder to find 9 adult male *R. pretiosa* (mean SVL 67.8 mm; range 59–74 mm) between underlying cobbles in water 5–20 cm deep. The boulder was located in a ca. 25 m-wide bay that receives the 2 main inflows in Penn Lake. The boulder was located ca. 5 m from the larger of these two inflows; heavy discharges during late-spring snowmelt keep the substrate around this main inflow clear of sediment and vegetation. The cobble/boulder substrate at this inflow represents < 2% (< 900 m^2) of the surface area of Penn Lake, and contrasts strongly with the organic sediments and heavy emergent vegetation in littoral zones around the rest of the 8.9-hectare lake. This is our first observation of aggregated *R. pretiosa* in >100 person-hours over 7 years of summer surveys at Penn Lake. During surveys at this and other *R. pretiosa* sites in the central Oregon Cascades, we typically find *R. pretiosa* adults occurring singly in or near warm, vegetated, shallows with flocculent substrate, which is used by frogs as escape cover (Licht 1986. Amer. Midl. Nat. 115:239–247).

The late-September timing of this observation, the atypical habitat, and the proximity of this aggregation to features sought by other ranids as overwintering sites (rock crevices, inflow streams, and associated springs) suggest that these Oregon Spotted Frogs were moving toward or were already in an overwintering location. Little is known of the overwintering habits of *R. pretiosa* (Watson et al. 2003. J. Herpetol. 37:292–300).

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SCINAX NASICUS (Lesser Snouted Treefrog). **PREDATION**. Birds are important predators on amphibians (Duellmann and Trueb 1994. Biology of Amphibians. Johns Hopkins, Baltimore. 670 pp.). *Scinax nasicus* is a small hylid that occurs in Paraguay, northern Argentina (south to Buenos Aires province), Uruguay, eastern Bolivia, and southern Brazil along the drainages of the Paraná and Paraguai Rivers (Frost 2002. Amphibian Species of the World: An online reference V2.21). On 27 Sep 2003 at ca. 0850 h I found an adult *Scinax nasicus* being preyed upon by a Great Kiskadee (*Pitangus sulphuratus*) along a fence in the Brazilian Pantanal, Nhumirim Ranch (18°59'S, 56°40'W), Mato Grosso do Sul State. The bird held the frog in its beak, and struck the frog on the fence until it was dead. The bird then swallowed the frog and flew away. *Scinax nasicus* sometimes vocalizes during the day, which might expose it to diurnal predators.

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SCINAX RUBER (Red Snouted Treefrog). **ARBOREALITY AND PARACHUTING**. Aerial descent in anurans occurs as both gliding and parachuting. Gliding is aerial descent at an angle <45° to the horizontal whereas parachuting is descent at >45° to the horizontal. Parachuting is known in several anurans including *Rhacophorus*, *Agalychnis*, and *Eleutherodactylus coqui* (Emerson and Koehl 1990. Evolution 44:1931–1946; Roberts 1994. J. Herpetol. 28:193–199; Stewart 1985. J. Herpetol. 19:391–401, and references therein), and it is suspected that many arboreal frogs may be capable of parachuting (Stewart 1985, *op. cit.*). Here we report on arboreal activity and parachuting in *Scinax ruber* from Gamboa, Panama.

Males of *S. ruber* call from the ground or low vegetation, and individuals and amplectant pairs can be found in shrubs and small trees. Arboreal activity at greater heights has not been reported although it is suspected (Ibañez et al. 1999. The Amphibians of Barro Colorado Nature Monument, Soberania National Park and Adjacent Areas. Editorial Mizrachi and Pujol, Panama. 192 pp.). Between 8–11 Aug 2004, we observed at least 20 *S. ruber*, including males and females, on the Gamboa Rainforest Resort Canopy Tower at heights up to 25 m, which is the top of the canopy. When approached or subsequent to a gentle touch, individuals jumped from the tower and descended to the ground, nearby vegetation, or to lower portions of the tower. Aerial descent was controlled and at angles >45°, which classifies it as parachuting.

On 8 Aug 2004 between 2200–2300 h, we observed eight *S. ruber* on the canopy tower. We returned the following night between 2325–0030 h (24.8°C at 25 m height) and observed 20 *S. ruber* of which 16 were captured and sexed. Aerial descents of these 16 individuals were observed, and we recorded the height at which each frog was found and the landing height to determine the vertical descent distance and also recorded the landing substrate (Table 1). Seven males, seven females, and two individuals of unknown sex were found. The average height at which individuals were found was 21.26 ± SE 1.01 m and the average vertical distance descended was 15.03 ± 1.63 m. Six of the females were gravid with eggs visible through the skin.

On 10 Aug between 2045–2115 h, ten *S. ruber* were observed on the canopy tower and another individual was observed in the top of a young palm 13.59 m from the ground. On 11 Aug between 1945–2030 h, 6 individuals were observed on the tower. These were weighed; two gravid females weighed 3.75 and 4.8 g while the four males weighed 2.5, 2.75, 3.35, and 4.15 g. Previous individuals observed appeared to be of similar sizes, and all appeared to be adults. Only one non-gravid female was found on the tower throughout the four observations. Although males with vocal sacs were observed in the tower, we did not detect any calling activity. Among all descents observed between 8–11 Aug (N = 44), the maximum horizontal distance covered was ca. 7 m, but most descents resulted in less than 4 m of horizontal travel. Two individuals that originally descending with their heads away from the tower rotated 180° to land lower on the tower. One of these traveled ca. 1 m out from the tower before rotating and returning to the tower. Another frog turned ca. 130° and landed on a palm. Other individuals either turned smaller amounts or did not turn before landing on the ground, tower, or nearby vegetation.

While parachuting, individuals held their arms and legs lateral to the body, bent, and partially extended. Fingers and toes were spread. This is a common posture in frogs capable of aerial descent (Emerson and Koehl, *op. cit.*). Gliding frogs typically have enlarged hands and feet with extensive webbing between digits and accessory skin flaps on the limbs (Emerson and Koehl, *op. cit.*). *Scinax ruber* lack these characters and only have moderately webbed feet with reduced webbing between the first and second toes and only basal webbing on the hands (Ibañez et al. *op. cit.*). Unlike in the parachuting frogs examined by Emerson and Koehl (*op. cit.*), however, *S. ruber* is capable of turning during descent. These observations confirm the suspicions of arboreal activity in *S. ruber* and demonstrate their capabilities for aerial descent via parachuting.

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TABLE 1. Sex, height observed, descent distance, and landing substrate of 16 *Scinax ruber*. Asterisks denote gravid females. Individual 5 turned ca. 90° around a corner of the tower, landing among several tree branches before we could accurately observe the landing height.

	Sex	Height found (m)	Descent distance (m)	Landing substrate
1	M	24.90	24.9	ground
2	M	24.90	21.4	vegetation
3	F*	24.90	24.9	ground
4	U	24.90	9.15	vegetation
5	U	24.90	N/A	vegetation
6	F*	24.0	11.23	vegetation
7	F*	23.4	11.47	vegetation
8	M	22.43	12.03	vegetation
9	M	21.9	9.29	vegetation
10	F*	21.4	21.4	ground
11	F*	20.04	19.5	vegetation
12	M	20.04	11.3	vegetation
13	M	17.25	16.75	vegetation
14	M	16.25	16.25	ground
15	F	15.0	3.52	tower
16	F*	12.37	12.37	ground

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SPEA HAMMONDII (Western Spadefoot). **REPRODUCTION**. *Spea hammondii* is restricted to semi-arid regions characterized by great variation in the amount, timing, and duration of rainfall, between and among years. Breeding activity of *S. hammondii* is closely associated with rainfall events and the availability of ephemeral pools (Jennings and Hayes 1994. Amphibian and Reptile Species of Special Concern in California. California Dept. Fish Game. Final Report Contract No. 8023. 94 pp.). Breeding has been reported to take place from January through May (Storer 1925. Univ. California Publ. Zool. 27:153–163; Brown 1976. Contrib. Sci. Los Angeles Co. Mus. Nat. Hist. 286:11; Stebbins 2003. Western Reptiles and Amphibians, 3rd. ed. Houghton Mifflin Co., Boston).

On 26 and 28 Dec 1996, SVC and ELE, observed *S. hammondii* larvae (ca. 4–10 mm TL) in an unshaded ephemeral pool that had formed in a road rut (3 m × 1 m, 15 cm deep) on a mesa dominated by a sage scrub/mixed grassland vegetation community at Mission Trails Regional Park, San Diego County, California, USA (32°50'86"N, 117°04'13"W, 248 m elev.).

On 30 Dec 1996, ELE observed *S. hammondii* larvae (ca. 13–15 mm TL) in an unshaded ephemeral pool that had formed in a road rut (5 m × 1 m, 20 cm deep) on a mesa dominated by chamise chaparral, University City, San Diego County (32°52'07"N, 117°11'43"W, 114 m elev.).

On 10 Nov 2002, ELE observed *S. hammondii* egg masses (N = 43) in an unshaded ephemeral pool that formed in a road rut (11 m × 2.5 m, 25 cm deep) surrounded by grassland at Mesa Del Arroz Preserve, Alpine, San Diego County (32°49'260"N, 116°45'076"W, 600 m elev.). An egg mass consisting of 22 egg capsules (Gosner stages 1–3) was collected and deposited in the herpetological collection of the California Academy of Science (CAS 226121).

On 9 Nov 2002, ELE observed *S. hammondii* egg masses (N = 26) in an unshaded vernal pool (3 m × 1 m, 15 cm deep) on the same mesa (as mentioned above) at Mission Trails Regional Park, San Diego County (32°50'159"N, 117°04'269"W, 255 m elev.). An egg mass consisting of 10 egg capsules (Gosner stages 8–9) was collected (CAS 226120). On 21 Nov. 2002, CDS and ELE salvaged 63 larvae from the same pool because the pool was in the final stages of drying (0.3 m diameter, 3 cm deep) as a result of evaporation and lack of additional precipitation (14–16 mm TL, Gosner stage 25) (CAS 226122–123). The pool had dried by 22 Nov. prior to any larvae successfully metamorphosing, resulting in 100% mortality. The pool refilled in late Nov due to rainshowers and on 8 Dec *S. hammondii* larvae (ca. 5–8 mm TL) were observed. During subsequent visits the pool was again drying prior to the metamorphosis of the larvae. On 24 Jan 2003, CDS and ELE found no surface water and clusters of dead *S. hammondii* larvae (~1800) in the wet mud of the pool basin. Approximately 200 of these slightly desiccated larvae were collected (19–33 mm TL, Gosner stages 25–30).

In the same vernal pool described above, CDS and ELE observed *S. hammondii* egg masses (N = 33) on 22 and 24 Oct 2004. On 24 Oct the embryos within the majority of egg clusters were