ratory, Agricultural Research Service, U.S. Dept. Agriculture, Beltsville, Maryland) identified both larvae collected on 09 July 2007 as *Neodiprion*. R. Bruce Bury provided helpful comments. This is contribution No. 20 of the WDFW Habitat Program Amphibian Research Group.

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ANURA — FROGS

ALSODES PEHUENCHE (NCN). **LARVAL BIOLOGY.** *Alsodes pehuenche* is a telmatobiine frog known only from the type locality, the Pehuenche Valley in the Central Andes of Argentina, on the border with Chile (Cei 1976. Atti. Soc. Ital. Sci. Nat. Museo Civ. Stor. Nat. Milano 117[3–4]:159–164). Its tadpole was described as belonging to *Telmatobius montanus* (Cei and Roig 1965. Copeia 1965[4]:421–425), but was later re-assigned to *Alsodes pehuenche* (Cei 1976, *op. cit.*). The species was described from mountain snowmelt streams with stony banks covered in herbaceous vegetation, near permanent snow, and from ponds of spring water, probably thermal, rich in sulphurous deposits (Cei 1965. Publ. Occ. Inst. Biol. Univ. Nac. Cuyo 7:1–4; Cei and Roig 1965, *op. cit.*; Cei 1976, *op. cit.*). Since the species was first described (Cei 1976, *op. cit.*), no contributions have been made to the knowledge of its biology, and its current population status is unknown. The species has been categorized as Data Deficient (IUCN et al. 2004. Global Amphibian Assessment. <www.globalamphibians.org>). This note provides life history information on the larval population structure and larval habitat of the species.

During February 2007 (austral summer) two visits were made to the type locality in the Pehuenche Valley (WGS 84, 35.97342°S, 7038181°W, 2523 m elev.), in western Mendoza Province, Malargüe Department, Argentina. Habitat is a high mountain, steep, desert landscape, with wet meadows and snowmelt streams. The climate is harsh and is characterized by a long winter and a short favorable season. Average precipitation (mainly in the form of snow) is 800 mm annually. The area is inaccessible from May to November (Cei and Videla 2003. Bol. Mus. Reg. Sci. Nat. Torino 20[2]:275–290). Following Cei's 1964 itinerary, we travelled ca. 30 km along Provincial Route N° 224 towards Paso Pehuenche along the Pehuenche Valley (1900–2530 m elev) in search of *Alsodes pehuenche* tadpoles in streams, meadows, and temporary pools. Of nine streams visited, *A. pehuenche* tadpoles were found only in the four located nearest to the International Pass, between 2491 and 2523 m elev, in agreement with Cei (1965, *op. cit.*). The frog *Pleurodema bufoninum* was found in temporary pools, and no anurans were found in the meadows.

Streams with *A. pehuenche* tadpoles are in very steep areas, although they have long stretches with gentle gradients and numerous waterfalls, and are surrounded by wet meadows. They have a maximum width of 2 m, carry a low volume of water and are exposed to strong summer radiation, with water temperature reaching 19°C at midday. Streambeds are stony, with fine organic sediment; periphyton and bacteria form a conspicuous reddish brown layer on the bottom. Snowmelt water in the streams is pure and contains a low concentration of ions, having very low conductivity (28–41μS/cm) and low hardness ($CaCO_3$ 11.68–15.01 mg/l). The concentration of sulphur is also very low (sulphides 0.3–2.44 mg/l). The pH was 5.9–7. No sulphur springs were found in the area. Midday air temperature was ca. 22°C. The tadpoles observed were concentrated in backwater sections of the streams. Groups were found ranging from 12–15 tadpoles occupying a surface area of 0.3 × 0.5 m or 0.5 × 0.8m, to groups of 50 tadpoles occupying surface areas of 1 × 1 m, giving density estimates ranging from 30 to 80 individuals/m^2. In all the streams, we found different cohorts of tadpoles of different sizes and stages (Gosner 1960. Herpetologica 16:183–190) living together, including newly hatched tadpoles (< 20 mm, Stage 25), medium-sized tadpoles (40 mm, Stage 26), large tadpoles (54–58 mm, Stages 31–34), and tadpoles near metamorphosis (62 mm, Stage 41; 57 mm, Stage 42).

Alsodes pehuenche tadpoles seem to prefer backwater sections of the streams, as they have no morphological adaptations to fast-flowing waters. None of the streams where *A. pehuenche* was found had characteristics of thermal waters with sulphurous deposits, nor any sign of volcanic activity. Cei and Roig (1965, *op. cit.*) mentioned finding adults and tadpoles in a "natural sulphur spring." There are two possible explanations for this statement. They may have mistaken the reddish-brown sediments (characteristic of these streams that drain wet meadows), for sulphurous deposits, perhaps influenced by the fact that the Termas de Cajón Grande hot springs, with their sulphurous pools, are located 20–30 km E of the area. The other possible explanation is that in 1964 there may have been an upwelling of sulphurous water that later disappeared as a result of the dynamics of volcanism itself.

Of the 17 species of the genus *Alsodes*, only *A. pehuenche*, *A. gargola*, *A. tumultuosus*, and *A. montanus* inhabit high mountain bodies of water in the Andes Range with similar environmental restrictions. The type locality of *A. pehuenche* has snowmelt streams with low conductivity and hardness, a long winter period with snow cover seven months a year, and an abrupt transition to summer with strong radiation and high temperatures, as do the high elevation localities of *Alsodes gargola* (Logares and Úbeda 2004. Herpetol. Rev. 35:368–369; Logares and Úbeda 2006. Amphibia-Reptilia 27[2]:263–267), *A. tumultuosus*, and *A. montanus* (Díaz and Valencia 1985. Oecologia 66:353–357). In this type of environmental scenario, the *A. pehuenche* tadpole development pattern bears similarities with the other three species.

The cohort of small, Gosner Stage 25 tadpoles found in February indicate a recent hatch during the summer that samples were taken. Similarly, for *A. montanus* and *A. tumultuosus*, early tadpoles (Stages 25–26) were reported in December–January (Díaz and Valencia 1985, *op. cit.*), and it was suggested that spawning occurred early in the favorable season. Similarly, *A. gargola* tadpoles hatch during a limited period in mid-summer (January–February) (C. Úbeda, pers. obs.). Cei and Roig (1965, *op. cit.*) mentioned the coexistence of *A. pehuenche* tadpoles of all stages and assumed that this could be due to repeated ovipositions during the summer season. Nevertheless, the large differences in size and development stage found among cohorts show that they belong

to ovipositions of different summers, as reported for *A. gargola*, for which there are up to three simultaneous cohorts of tadpoles, each cohort having hatched during a different summer (Logares and Úbeda 2004, *op. cit.*).

Cei (1965, *op. cit.*) suggested that tadpoles probably do not complete metamorphosis in a single period, but their larval life extends over two annual cycles. Our field observations support a long larval period in *A. pehuenche* and tadpole overwintering for at least two winters. It has now been shown that *A. gargola* tadpoles overwinter in high Patagonian Andean aquatic environments subject to a long winter season with snow cover (Logares and Úbeda 2004, 2006, *op. cit.*). An extended larval stage, tadpoles that overwinter, and a similar pattern of sizes and stages have also been found for *A. montanus* and *A. tumultuosus* (Díaz and Valencia 1985, *op. cit.*).

Our finding of *A. pehuenche* tadpoles nearing transformation in the middle of the favorable season matches the date recorded for *A. gargola* (Logares and Úbeda 2004, *op. cit.*), *A. tumultuosus*, and *A. montanus*, which had large metamorphosing larvae at the beginning of the favorable season, and recently transformed froglets during summer (December–March) (Díaz and Valencia 1985, *op. cit.*).

The habitat of *A. pehuenche* may soon be altered when the road through the Andes between Argentina and Chile is paved. Traffic is expected to increase over the following years, along with the consequent impact on the only known populations of the species. The streams occupied by *A. pehuenche* cross the road, and tadpoles have been found just a few meters upstream and downstream from the road. Although this contribution provides new information on basic aspects of larval natural history and microhabitat, further studies are needed. Because of this species' restricted range and the lack of information on its biology, we believe that further studies are urgently needed to develop conservation plans.

We thank Dirección de Recursos Naturales Renovables de la Provincia de Mendoza for subsidizing water analysis, and Gustavo Baffico for helpful comments on the interpretation on these analyses.

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ASCAPHUS TRUEI (Coastal Tailed Frog). **ATYPICAL AMPLEXUS.** Cross-species amplectic behavior has been reported with some frequency among anurans, but reports are limited to lentic-breeding amphibians (Brodie 1968. Herpetologica 24:86; Brown 1977. J. Herpetol. 11:92–94; Storm 1952. Herpetologica 8:108). Herein, we report the first observed case of inter-species amplexus involving the stream-breeding *Ascaphus truei*.

This observation was made on a small (< 1 m wide), 1st-order (Strahler 1952. Geol. Soc. Am. Bull. 63:1117–1142), seasonally intermittent, non-fish-bearing stream, a tributary of the South Fork Willapa River, Pacific County, Washington, USA (WGS 84, 46.585°N, 123.731°W, elev. 248 m). This site, located in a 50-year old second-growth forest managed for timber by the Washington Department of Natural Resources (WDNR), is dominated by Western Hemlock (*Tsuga heterophylla*) with Sword Fern (*Polystichum munitum*) and Oregon Oxalis (*Oxalis oregona*) in the understory.

On 15 May 2007, KMP and TRC found an adult (38 mm SVL) male *A. truei* in amplexus with a dead juvenile (45 mm SVL) *Rana aurora* in a small (0.8 m long, 11 cm deep) gravel-dominated pool. Both frogs were encountered ventral side up with the *A. truei* clasping the waist of the *R. aurora*. The *R. aurora*, dead, was slightly bloated, had its digestive track partly everted through its mouth, its left hand missing, and only one digit on its right hand. The male tailed frog's "tail" appendage was erect, directed anteriorly, and visibly engorged. Notably, the *A. truei* made no obvious response when picked up with the *R. aurora* from the pool, becoming active only after it was carefully removed for measurement from its firm grip on the dead *R. aurora*. The *A. truei* was released at the point of capture and the *R. aurora* was discarded.

Whether the *R. aurora* died before or after being clasped is unclear. The typical amplectic posture by the male *A. truei* (Slater 1931. Copeia 1931:62–63; Wemz 1969. J. Herpetol. 3:167–169) involves hand clasping from an inguinal position. This appeared to direct pressure on the mid-abdomen, and may have resulted in the partial eversion of the digestive track we observed. Moreover, if the *R. aurora* was alive when clasped, as a juvenile, it would not have responded. Noble and Aronson (1942. Bull. Am. Mus. Nat. Hist. 80:127–142) showed experimentally that frog girth represents a primary amplectic inducement for male frogs, so the *A. truei* may have perceived the juvenile *R. aurora* as a key stimulus; the juvenile *R. aurora* was about the size and shape of a gravid female *A. truei*.

Fieldwork was supported by the Forests and Fish Adaptive Management Program, Washington Department of Fish and Wildlife (WDFW). WDNR facilitated work on their land. Studies were done under a programmatic WDFW handling permit provided to employees in the course of their work. This is contribution No. 21 of the Forests and Fish Section of the WDFW Habitat Program Amphibian Research Group.

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BOKERMANNOHYLA CIRCUMDATA (Espirito Santo Treefrog). **PREDATION.** Amphibians are commonly preyed upon by spiders and snakes (Neill 1948. Herpetologica 4:158; Rowe