

## Remarks on the northeasternmost distribution of *Elgaria coerulea principis* Baird & Girard, 1852 (Squamata: Anguinae) in British Columbia

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**Abstract.** Although the Northwestern Alligator Lizard (Squamata: Anguinae: *Elgaria coerulea principis*) is the most widespread lizard in British Columbia (Canada), its northeasternmost population seems to have been overseen in recent years. Based on own data and summarizing published and unpublished reports, we recognized this species from the city of Revelstoke and its southern and northeastern adjacent areas.

**Key words.** Anguinae, Canada, *Elgaria coerulea principis*, geographic distribution, Northwestern Alligator Lizard, Revelstoke.

Only four lizard species are known to occur in the Canadian province of British Columbia (BC). These are the three native ones, *Phrynosoma douglassii* (Bell, 1828) (Phrynosomatidae), *Plestiodon skiltonianus* Baird & Girard, 1852 (Scincidae), and *Elgaria coerulea* (Wiegmann, 1828) (Anguinae), as well as the invasive *Podarcis muralis* (Laurenti, 1768) (Lacertidae). Of these, *E. coerulea* is by far the most common and widespread lizard found in the province and is exclusively represented by its subspecies *E. c. principis* Baird & Girard, 1852, the Northwestern Alligator Lizard (Nussbaum et al. 1983; Matsuda et al. 2006). It can be distinguished from the other species inhabiting BC by its slender brownish body with rather inconspicuous dark markings and by a mid-lateral band of small scales between the larger dorsal and ventral scales (Matsuda et al. 2006). The diurnal alligator lizard is relatively small (snout-vent length usually less than 100 mm) and viviparous, life history traits commonly found in lizards at these latitudes in continental North America (Vitt 1973; Powell & Russell 2007).

While *E. c. principis* is the most widespread subspecies of *E. coerulea* and has its main distribution in BC and in the northwestern United States (Idaho, Montana, Oregon and Washington, extreme northern California), other subspecies range southwards to central California and Nevada (Smith 1946; Nussbaum et al. 1983). In BC, they are supposed to inhabit a narrow belt in the southern part of the province except for the very southeastern parts. Their northernmost occurrence has been reported from the area around Clearwater within central BC, and near Stuie in coastal BC, while the southeasternmost records are from Creston (Seburn & Brooks 2007).

On September 25, 2009 we observed a specimen of the Northwestern Alligator Lizard within the city limits of Revelstoke (Fig. 1). It was found in a backyard (400 Second Street West, Revelstoke, British Columbia, V0E 2S0,

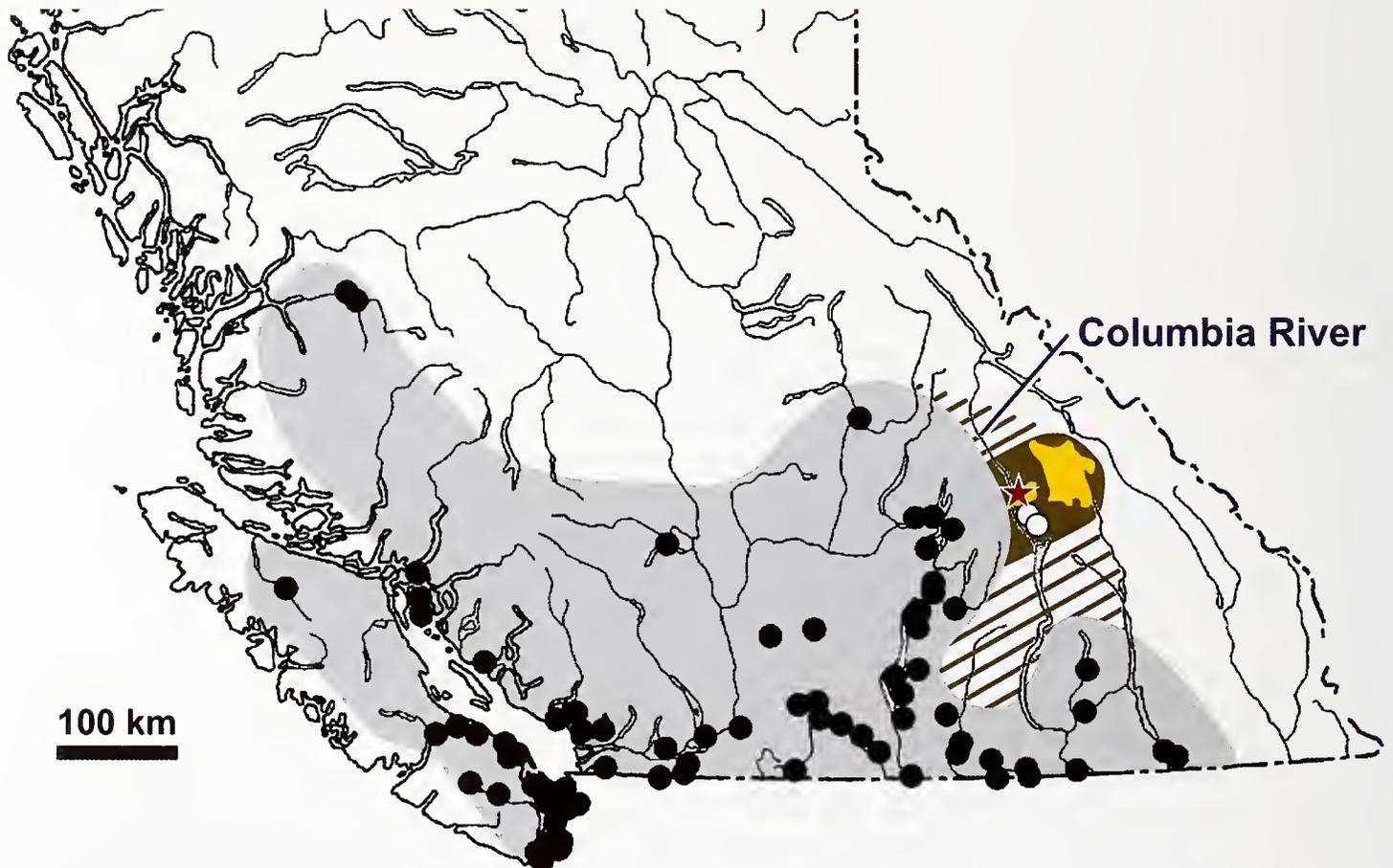
Canada), approximately at 51°0'0.68" N, 118°11'56.01" W. The individual was observed, identified and photographed, but was not collected as no permit was available during the encounter.

According to the most recent comprehensive account of this species (Matsuda et al. 2006), the closest known occurrences, in relation to our present record, are those around Sicamous and Kaslo. These localities have already been mentioned by Van Denburgh (1922) and are approximately 60 km west and 130 km south of Revelstoke respectively (Fig. 2). Similarly, the official online database for BC reptiles (Anonymous 2011) gives an estimated range of *E. c. principis* that more or less matches the reference points provided by Matsuda et al. (2006) (Fig. 2). However, a much older account on the reptiles of the Northwest Pacific by Nussbaum et al. (1983) reports *E. c. principis* from around Revelstoke. Furthermore, an unpublished pamphlet distributed locally in that area (FMRG no year), indicates that *E. coerulea* is a year-round resident known from Mount Revelstoke Park and Glacier National Park. Both parks extend in total about 75 km further northeast than the city of Revelstoke. In this regard it may be worth mentioning that the FMRG list focuses exclusively on the area within the national parks. *Chrysemys picta* (Schneider, 1783) (Emydidae), for instance, is listed with the remark that it is not actually known from the parks themselves but is commonly only found along the Columbia River near Revelstoke. Another recent, but unfortunately again unpublished report by a local hydroelectric utility mentions specimens of *E. coerulea* from the eastern shore of the Arrow Lakes Reservoir which is located a few km south of the city of Revelstoke (Hawkes & Tuttle 2010).

As a consequence, the range of *E. c. principis* certainly reaches several kilometers more northeasternwards than it is currently assumed (Fig. 2). The fact that *E. c. prin-*



**Fig. 1.** The specimen of *Elgaria coerulea principis* (alive, not collected) encountered in Revelstoke (British Columbia, Canada) on September 25, 2009. Photograph: Kerstin Graba.



**Fig. 2.** Map of southern British Columbia (Canada) with known occurrences (black dots) of *Elgaria coerulea principis* (see Matsuda et al. 2006) and a recent estimation of its range (gray area, see Anonymous 2011). Note that the records from Revelstoke (red star, present report and from Nussbaum et al. 1983), those from Mount Revelstoke and Glacier National Parks (yellow area, FM-RG no year) and also those from the Arrow Lakes Reservoir (white circles, Hawkes & Tuttle 2010) are all located east of the Columbia River. The therefore confirmed range extension is indicated by the brown area and our hypothesized possible range extension is indicated by the brown hatched area.

*cipis* has been reported to be very sedentary, meaning that even roads (Rutherford & Gregory 2003) and small rivers (Stewart 1985) can act as effective barriers between populations, may have further implications: Revelstoke, both national parks and the localities where alligator lizards were found along the Arrow Lakes Reservoir are located on the eastern side of the Columbia River. The Columbia River is the largest river flowing to the Pacific in North America and in BC its main course flows almost in a straight line from Revelstoke south towards the United States (Stanford et al. 2010). Consequently, it probably represents an insurmountable barrier for these lizards. A possible scenario is that *E. c. principis* inhabits the areas along the eastern streambank of the Columbia River which are north of those near Kaslo, reaching at least Revelstoke and the two mentioned national parks in the North (Fig. 2). Another interesting fact is that the Illecillewaet River (in a more or less parallel and neighboring manner with the Trans-Canada Highway) flows from the northeast of Glacier National Park southwest until it reaches Revelstoke and joins the Columbia River (Mussio & Mussio 2011). Most of the area of Glacier and Mount Revelstoke National Parks, as well as the locality in Revelstoke in which we found the alligator lizard, are north relative to this potential Illecillewaet River barrier. The specimens from the Arrow Lakes Reservoir, however, were found south of it, making two distinct populations of the Northwestern Alligator Lizard at its northeasternmost range possible. However, more sampling and, ideally, studies on population genetics are urgently needed to test these latter hypotheses.

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