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WESTERN RANGE EXTENSION FOR THE BLACK SANDSHELL (UNIONIDAE: *LIGUMIA RECTA* [LAMARCK, 1819])

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ABSTRACT.—We report a population of the mussel the black sandshell (*Ligumia recta* [Lamarck, 1819]) from the Carrot River in Saskatchewan, far north of the species' known range in southern Manitoba and northwestern Ontario. *Ligumia recta* is reported to be declining substantially in its abundance and range, and this occurrence provides valuable information for the construction of a species status report in Canada.

Key words: Ligumia recta, *Unionidae, Saskatchewan, Carrot River.*

Previous concern for the survival and occurrence of the black sandshell *Ligumia recta* (Lamarck, 1819) has been raised by Williams et al. (1992), who even recommended this species as cause for concern in North America. In Canada *L. recta* is documented only within the southern portion of Manitoba and Lake of the Woods area Ontario (Fig. 1; Clarke 1973). More recently, however, Eva Pip (2000) provided one of the first descriptions of changes in freshwater molluscan abundances for western Canada and identified declines across many taxa including the black sandshell mussel *L. recta.* Before a status report on this and other species can be assembled, it is of great value to first assess a more current and detailed account of uncommon species' occurrences. Here we report the collection of *L. recta* from the Carrot River, far to the north of any previous occurrence and novel to both the waterbody and the province of Saskatchewan.

On 13 September 2007 the Benthic Entomology (BENT) Lab of the Saskatchewan Watershed Authority encountered this species during routine biomonitoring sampling in the Carrot River Watershed and through our associated mussel survey program. Five paired valves of the black sandshell were collected along the margin of the river and returned to the laboratory for confirmation of identification, while a single live specimen was noted and returned to the river (Fig. 1).

Specimens of *L. recta* were identified by common keys (Clarke 1973, Clarke 1981, Cummings and Mayer 1992) and verified by D. Graf of the Academy of Natural Sciences, Philadelphia, Pennsylvania. Voucher specimens have been deposited in the malacology collections of the Academy of Natural Sciences (Philadelphia, PA), the Canadian Museum of Nature (Ottawa, Ontario, Canada), and the Royal Saskatchewan Museum (Regina, Saskatchewan, Canada) and are maintained in the Saskatchewan Watershed Authority, BENT Voucher Series (Saskatoon, Saskatchewan, Canada).

Saskatchewan: *Ligumia recta* (Lamarck, 1819): R.M. Hudson Bay: (53°40′N, 102°00′W), 13.ix.2007, I.D. Phillips, along depositional shelf of Carrot River at the Environment Canada, Prairie Provinces Water Board long-term water-monitoring reach known as "Carrot River Reach: Turnberry to mouth of Carrot River."

Other mussels encountered at this site were the common floater (*Pyganodon grandis* [Say]), the fatmucket (*Lamsilis siliquoidea* [Barnes]) and the white heelsplitter (*Lasmigona complinata* [Barnes]).

The Carrot River in this area runs through mixed aspen parkland forest and a glacial alluvium that imparts a characteristic brown water coloring; at the time of our survey, turbidity was 18.5 NTUs, water temperature was 9.7 °C, specific conductivity was 600 μS, maximum depth was 2.13 m, and wetted width was 24.5 m. The study reach was dominated by silt (75%), with frequent small gravel beds (25%).

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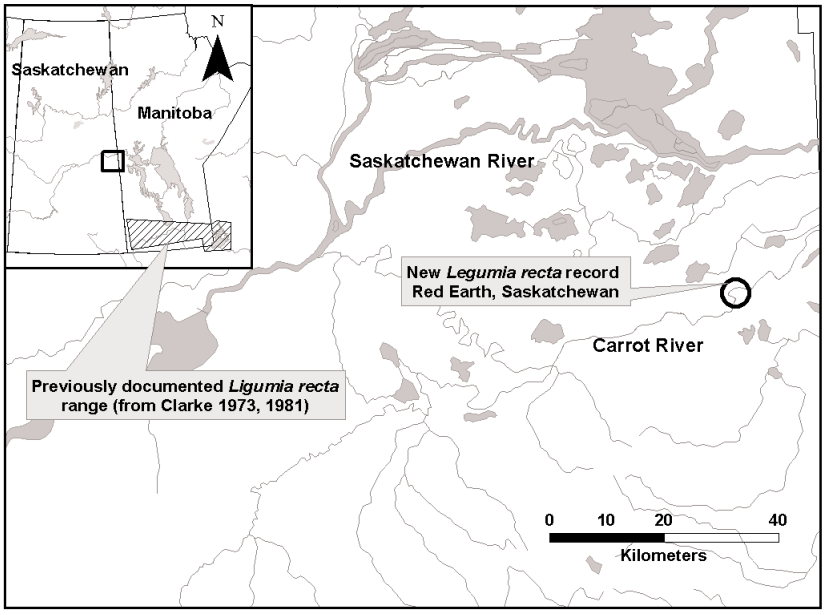

Fig. 1. New record of *Ligumia recta* (Lamarck, 1819) in Saskatchewan, Canada, relative to known distribution.

To our knowledge this is the farthest west *L. recta* has been recorded in Canada, and this area may function as an important source population if landscape management activities mitigate stresses that occur in watersheds such as the Carrot River. The Carrot River is one of very few rivers in Saskatchewan that lacks any damming or reservoirs, but it is dominated by substantial agricultural activities further upstream in the watershed. Pip (2000) associated habitat disturbance, increased siltation, water-level fluctuations from dams, and harvesting as the leading causes of decline in freshwater mussel populations in western Canada. Stresses such as low-flow disturbance and dam-flow fluctuation may be exacerbated by the expected decline in surface water runoff as the prairies become much drier with warming climate in the future (Schindler and Donahue 2006). The next steps in conservation of these important freshwater filterers, in anticipation of future perturbation, are the preparation of a current status report for western Canada and the protection of habitat around populations of species of concern such as *L. recta.*

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Two additional populations have been documented since acceptance of this manuscript: (1) R.M. Prince Albert: (53°14′N, 102°04′W), 16.vi.2009, K.L. Kirkham, I.D. Phillips, A.J. Anton, South and Mainstem reaches, forks of North and South Sask. rivers; (2) R.M. Corman Park: (53°16′N, 106°29′W), 15.vi.2009, K.L. Kirkham, I.D. Phillips, A.J. Ashton, South Sask. River at Cathedral Bluffs.

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