

THE POPULAR CLAMMER: a newsletter about freshwater Unionoid mussels in Canada

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Report on Unionid Conservation & Exploration in Eastern Ontario: 2007

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Zebra Mussels take over the Rideau Canal bypass rapids at Andrewville & Burritts Rapids:

On 6 May, in the Rideau River, 0.1 km SSE of the Andrewville bridge. (44.95020N 75.81917W), we found a huge pile of newly dead shells at the foot of the limestone flats that had a big population of big *Lampsilis*, *Ligumia recta*, and *Lasmigona costata*. Many had attached *Dreissena* (Zebra Mussels), which have obviously further increased here far beyond the level reported in [Martel, André L., Jacqueline Madill and Frederick Schueler. \(2006\). Apparent refugia of native freshwater mussels in the upper Rideau River threatened by increased Dreissena 15 years after its introduction TENTACLE 14:31-32.](#)

On 9 July we found the bottom littered with dead Unionid shells, so densely piled at the foot of the flat that Fred picked up about 8 litres of shells without moving his feet. There were, among these but not collected, 4 large living *Elliptio complanata*, and one small *Lampsilis*, all with attached *Dreissena*. Everywhere the bottom is dark with a pavement of very living Zebras. as the Rideau at Carleton University was in 1995. Also we saw a few *Orconectes rusticus* (Rusty Crayfish) crawling out from under rocks as dusk fell. Also the banks are mostly crowded with Cathartic Buckthorn and Tartarian Honeysuckle,

and there are dense islands of Flowering Rush and Hybrid Cattail in the main channel. We suggested that Parks Canada should change the name of Andrewville to "Aliensville" and open a theme park....

On 3 August, with Selena Barre, we took our traditional drift sample from the upstream end of the flats. This used to be *Bithynia* and *Viviparus* snails, but now it's about 65% small *Dreissena* shells, 25% *Bithynia*, and 5% *Viviparus georgianus* (Banded Mystery Snail), with a scattering of *Helisoma* and *Stagnicola elodes* (Common Stagnicola).

On 13 May, a ways downstream from here, just above the Burritts Rapids bridge (44.98210N 75.79806W), Fred found *Dreissena polymorpha* at densities of perhaps 500/sq m on top surfaces of rocks, and on the 2 living *Elliptio complanata* found among many shells of this species and a lot of *Lampsilis* shells. Fred had gone there to seek *Bithynia tentaculata*, the 19th century counterpart of the Zebra Mussel, for our workshop on macro-invertebrate identification, but he found only a few small shells. In 1998 the bottom of the pool here was covered with shells of *Bithynia* to a depth of >>30cm, over an area of 5.6 x 3.8 m, with water depth decreasing from 2 m at the periphery to 75 cm in the centre of the pile, so that (at 12 shells/ml), this suggested something like 120 million shells in the pile. At that time, *Bithynia* were the dominant life form under rocks. It now looks as if something associated with the increase in Zebra Mussels has greatly reduced *Bithynia's* numbers.

Workshop on macroinvertebrate identification:

On 14 May, the South Nation Conservation (SNC), hosted a workshop for Conservation Authority staff and consultants at their offices in Berwick. With the assistance of Judy Courteau, we prepared an **"Introduction to the 'macro' Invertebrates of Southern, especially Eastern, Ontario"** with outlines of life history & relationships and identification of species of Crayfish, Unionids, and large Aquatic Snails. We successfully transported a great number of specimens to and from the all-day workshop, which was well received, and seems to have stimulated local interest in macro-invertebrate conservation. SNC staff collected and brought in shells that they found in the course of summer field work (though we haven't found time to go through the specimens).

***Anodonta implicata* (not!) in the South Nation**

River: After the 14 May workshop, above & below the Chrysler bridge over the South Nation River (45.21935N 75.15353W) we & Judy Courteau found *Pyganodon grandis* (many shells), *Utterbackia imbecillis* (9 shells, most fairly fresh), *Lasmigona costata* (3 shells), *Lasmigona compressa* (2 shells), *Lampsilis radiata* (25 shells), *Elliptio complanata* (17 shells), and fatefully, *Dreissena polymorpha* (6 tiny juvs, and 29 mm ad on an *Utterbackia* shell) at the downstream end of rubble on limestone flats below the dam,

Fred was back to Chrysler on 14 June at the South Nation River above the dam (45.21314N 75.15839W), motivated by shells found in 2001 which he'd thought might be *Anodonta implicata* (Alewife Floater) because of their "smudge-like pink anterior nacre deposits, coarse two-looped beak sculpture, double posterior ridge and other characters of this species." We'd later concluded that these were, equally colorfully but less anomalously, the orange-smudged "salmoides" form of *Pyganodon grandis*. He gathered shells from buried Muskrat piles: slender green *Lampsilis* with vivid rays, big heavy *Elliptio* with lilac interiors, pea-soup green *Utterbackia*, a *Ligumia recta* (Black Sand-Shell), black without and pink & white within, and numerous

Pyganodon with orangy-pink nacre. There were also *Campeloma* Mystery Snails, Muskrat bones gone black in the mud, and a couple of big Zebra Mussel shells. This sample shows that this reach of the SNR has a rich and distinctive fauna, and that Zebras are here, in what we can only (hopelessly) hope will continue to be small numbers.

Zebra monitoring continues to find increases along the Mississippi:

On 17 June, at Carleton Place, the Mississippi R/Hwy 29 bypass, GE Findlay Nature Park (45.15011N 76.13969W), in a brief visit we found *Dreissena* at a density of 150/sq m on the underside of a 50 x 50 cm rock, and the bottom speckled with white shells. The water, downstream of heavily Zebraed Mississippi Lake, was warm, very clear, and fairly high. We found some *Elliptio complanata* alive, but made no particularly intense search for Unionids.

On 6 July 2007, downstream of there, in an eddy of the the Mississippi, SW of the Blakeney bridge (45.26704N 76.25066W) we took our annual sample of accumulated shells: *Elliptio complanata*, *Lasmigona costata*, *Lampsilis*, *Alasmidonta marginata*, a few *Ligumia recta*, a single *Pyganodon grandis*. These were all old shells, and there were few *Dreissena* shells in the shell pile, so Zebra-caused mortality has not yet set in here. However, a few metres above the sample site large *Dreissena* were exposed on the bottom at 20-100/sq m, the most ever seen here. There weren't more under the few rocks turned than on the upper surfaces, and there weren't many smaller ones to be seen.

On 5 August, just downstream from the Glen Isle bridge (45.16057N 76.12704W), in the shallow rocky riffle/rapids of the Mississippi, we found the expected *Elliptio complanata* and stubby upper-Mississippi *Lampsilis radiata*, with *Dreissena polymorpha* scattered on bedrock at a density of 1/sq m on the east side of channel and 3/sq m on the west side, with as many as 88/sq m under flat rocks.

COSEWIC-endangered *Ligumia nasuta* at status quo in Lyn Creek: On 19 August, from the deep Dogwood-lined, Beaver-impounded Lyn/Golden Creeks, 0.9 km ESE Lyn (44.57479N 75.77347W), Fred picked up 7 *Elliptio complanata*, 4 *Lampsilis radiata* and 1 living *Ligumia nasuta* from a 50 x 50 cm area right at the point of confluence.

Moose Creek no refuge for South Nation River Unionids: Fred had proposed that "...Unionid mussels survive in many tributaries to the Ottawa and St Lawrence rivers where the main channel populations have been eliminated by Zebra Mussels or waterlevel fluctuations behind dams, and a goal of my field work... finding these tributary populations. [The deep slow channel of] Moose Creek may harbour several species that have been eliminated by Zebra mussels in the main channel of the SNR..."

On 21 he and Lars Karstad & Naomi Langlois-Anderson of South Nation Conservation visited the mouth of Moose Creek (45.39433N 75.06352), and canoed more than 1 km upstream. In the "deep slow channel" above the Co Rd 16 bridge, which they had hoped would have provided the refuge, the banks dropped off precipitously to >2 m depth, and no Unionidae were to be seen on any of the shore they scanned on foot or by canoe.

Upstream of there, where the creek is a turbid quiet slot between banks of *Eupatorium maculatum* (Spotted Joe Pye Weed), big pale *Laportea canadensis* (Wood Nettle) with robust palm-like flowerheads, *Acer negundo* (Manitoba Maple), and glades of *Eupatorium rugosum* (White-snakeroot) there were no Zebra Mussels, but they found only a few *Pyganodon grandis* (Common Floater) shells. The streambed is a very stiff clay, but it often has an overlay of fine gravel or coarse sand, which we have to assume is somehow a bad habitat for the Unionid diversity we'd anticipated -- unless there are populations in the deep water whose shells don't wash up to the surface.

Fall River/Hwy 7, blighted by Zebras. On 7 September, we and Corey T. Wood stopped here (44.83507N 76.54950W) and worked this shallow rock-bedrock/sand river between marshy reaches, which we'd often wondered about from the highway, and found *Dreissena polymorpha* (Zebra Mussel), about 1/sq m on bottom, more under rocks. We handled more than 15 adult *Elliptio complanata* (Eastern Elliptio), and collected shells, and found 1 juvenile *Lasmigona compressa* (Brook Lasmigona).

No surprises on Amherst Island: On 24 September we and Corey T. Wood visited around on Amherst Island SW of Kingston. On the Lake Ontario shore *Dreissena* was the only conspicuous animate production, with scattered old shells of *Lampsilis radiata* (Eastern Lamp-Mussel) and *Elliptio complanata* (Eastern Elliptio), with the addition of *Pyganodon grandis* (Common Floater) on a fine-sand beach of a low-energy Lake Ontario bay. We were primarily surveying roadside invasive plants, and didn't seek out inland water, but what we did encounter didn't support any Unionids.

Potamilus blanketed by Zebras at the mouth of the South Nation: The low-calcium Ottawa River is the largest *Dreissena*-free river in central Canada, despite calcium-rich tributaries (Mississippi, Rideau, & South Nation) that pour vast numbers of veligers into it (see [Martel, André L., Isabelle Picard, Nancy Binnie, Beverly Sawchuk, Jacqueline Madill, and Frederick Schueler. \(2006\) *The rare Olive Hickorynut mussel, Obovaria olivaria, in the Ottawa River, Eastern Canada.* TENTACLE 14:30-31.](#))

On 26 September the SNC invited Fred to accompany Ryan Robson, Stephanie Goom, and Maria Waldron to survey islands in the Ottawa River at the mouth of the South Nation River. In the fine-sand/clay bottom near a marshy island in the river mouth (45.57543N 75.10286W) at 50 cm depth, they found living *Elliptio complanta* (15), *Lampsilis radiata* (6), and *Pyganodon grandis* (1). There was also a 107 mm *Potamilus alatus* (Pink Heelsplitter), crusted with little *Dreissena*. This may be the first living specimen found on the Ontario side of the Ottawa River (Picard, Isabelle,

(*Report on Unionid Conservation in Eastern Ontario: 2007, continued*)

Jean-François Desroches, Frederick W. Schueler, and André L. Martel. *Modern records of the Pink Heelsplitter mussel, Potamilus alatus (Say, 1817), in the Ottawa River drainage, Québec and Ontario, Canada.* in revision, Northeastern Naturalist.)

On the E bank of the South Nation River, 2.7 km WNW Highway 17 at Jessups Falls (45.57207N 75.09270W), we found living *Elliptio complanata* in a muddy inlet, leading us to contemplate methods of surveying the *Dreissena*-crowded deep clay channel of the river for any surviving Unionids, which we concluded could only be done with a brail.

“We scarcely entered the stream -- mostly we just staggered around at astonishment from the number and fresh condition of the shells, and the numbers we saw in the water:” On the way back from the mouth of the South Nation, Fred and the SNC crew made a necessarily brief stop at Bear Brook, about a kilometre above its mouth, 1 km SSE Ettyville (45.42051N 75.08420W). This is an incised meandering clay/sand/cobble creek among agricultural fields. The shallows were crowded with mussels, and they hurriedly gathered shells from the sandy banks: *Elliptio complanata* (30), *Lampsilis cf. cardium* (39), *Ligumia recta* (18), *Lasmigona costata* (17), *Alasmidonta undulata* (5), *Lasmigona compressa* (1) and, *Leptodea fragilis* (1 116 mm weakly alate valve).

This confirmed upstream observations of high diversity in Bear Brook, hinted that Bear Brook might be a tributary refuge for big-river species such as *Leptodea fragilis*, and suggested a survey of nearby Wolf Creek, the least-disturbed subwatershed of the South Nation drainage (a proposed SNC trip to Wolf Creek had to be cancelled due to October rain and staffing changes, but will occur next year).

***Alasmidonta marginata* in the Tay:** In October, Fred and Matt Keevil undertook “*An Assessment of Species at Risk and Associated Habitat at Perth Wildlife Reserve Conservation Area,*” for the Rideau Valley Conservation Authority. The only rare species they found was, in the Tay Canal, 4.3

km ESE Perth (44.89322N 76.19982W), in a 50 cm deep bedrock bay of the narrow rock-bordered canal with shrubby-marshy shores, a 92 mm pair of *Alasmidonta marginata* (Elktoe) valves. There were also *Elliptio complanata* and *Lasmigona costata* in this bay. Fred had found one Elktoe in Perth in 1995, so this is the second specimen for the Tay, and also for the whole Rideau system. In eastern Ontario this species is common only in the Mississippi River below Almonte, where it's threatened by Zebra Mussels (see above). They advised the RVCA to “Monitor the occurrence of Zebra Mussels in Jebbs Creek and the Tay River & Canal, and also the concentration of calcium in the water, trying to ensure that nothing is done in the drainage basin to push this over the threshold value of 10mg/L (or 9-28 mg/L -- see [Cohen & Weinstein 2001](#)).”

Cleaning up on Ottawa Clams: On 20 October Fred and Rory Tanner joined the Ottawa Riverkeepers in a “cleanup” of Kettle Island, a large wilderness island on the Quebec side of the Ottawa River, just below the mouths of the Rideau and Gatineau Rivers (45.46572N 75.67389W, and some km ESE). There's no reason why stream cleanups, which are very popular environmentalist activities, shouldn't also gather shells, and contribute to both our knowledge of Unionid faunas, and public appreciation of Unionoids.

In this case Fred & Rory found many *Elliptio complanata*, fewer *Lampsilis*, a few *Ligumia recta* and a single old *Dreissena* shell (including one bag of specimens that was mistaken for trash, and was lost in a dumpster). They observed the decentralized format of the stream cleanup, and concluded that the “shelling” of cleanups would require an information sheet for each participant, and someone to sit at a desk at the central collection point to accept and identify collections and advise participants.

Muskrat troves of the Champlain Bridge Islands: On 26 October Fred & Matt Keevil continued the monitoring of invertebrates and Salamanders on the islands in the Ottawa River that are spanned by the Champlain Bridge, which

(Report on Unionid Conservation in Eastern Ontario: 2007, continued)

we've been doing since 1975. They found the Unionids little changed from previous visits (many *Elliptio complanata*, fewer *Lampsilis*, a few *Ligumia recta*). But they were astonished by a shell pile at the E end of Riopelle Island, among the stems of a venerable *Myrica gale* (Sweet Gale) patch (45.40646N 75.75404W), where four handfulls from a 2 x 2 m open area, where the shells are 7-10 cm deep, yielded 71 *Elliptio complanata*. Conservatively estimating that each handful represented the shells in a 10 x 10 cm area, the total number in this central area is something like 7100, and as this is perhaps 10% of the shells in the *Myrica* patch, the total in the pile is something like 70,000 shells. The area around the *Myrica* patch is covered with trampled shells -- but

evidently no one has previously walked inside the patch. We have no idea how long a period of predation this patch represents (or if shells may be carried here by the current in times of high water).

Not-at-risk survey of the Petawawa area: Over the past two field seasons, Nancy Hiscock has collected shells found around Canadian Forces Base Petawawa in the course of SAR surveys for the Base. So far these have been mostly *Elliptio* and *Lampsilis*, so they haven't registered on the SAR funding meter, but they have given us a much better sampling of the fauna from the area.

Clammy submissions

Readers will have noticed that this inaugural edition of *The Popular Clammer* is all about us. This is because we only thought to inaugurate it while writing up our report to the current Ontario Freshwater Mussel Recovery Team Meeting. Our title comes from a political discussion in Walt Kelly's *Pogo* strip, in which the preferences of "the popular clammer" were contrasted to those of "our roisterers." We see this as a Canadian revival of the discontinued *Triannual Unionid Report*. If you think an electronically distributed newsletter about freshwater mussel research and conservation in Canada is a worthwhile idea, be sure that your activities, interests, and discoveries are adequately represented. Further issues will be published when there's sufficient material assembled. We'll put each issue up on our website, and assemble a subscription list of those who want to be notified of future numbers. Please submit plans and reports of conservation activities, accounts of events, abstracts of publications, results, stories, trivia, poems, comments, photos, etc. to me at bckcdb@istar.ca Bishops Mills Natural History Centre, RR#2 Bishops Mills, Ontario, K0G 1T0. We'd like to have a peer-reviewed section on **Unexpected** distributional and life history discoveries, modeled on the notes section of *Herpetological Review*. -- Fred Schueler.