

Why Birds and Birders Flock to Sewage Lagoons



Feature Article by J. Ryan Zimmerling

Photo: Jacques Bouvier

In a typical sewer stroll, birders visit a series of manmade wetlands. But these are not just ordinary wetlands – these are the kind of wetlands that birders dream of, with elevated berms around the periphery of the open water providing excellent vantage points for scanning large concentrations of birds. Moreover, during spring and fall, as the water levels drastically rise and fall, these manmade wetlands provide a keen-eyed birder with the opportunity to see unusual shorebirds, marshbirds, waterfowl and even rarities such as Glossy Ibis, Tricolored Heron, and Eurasian Wigeon. Surprisingly, the odds are very high that you live within a short driving distance of one of these incredible wetlands.

For decades, birders throughout North America have known that sewage lagoons (also sometimes called municipal waste stabilization ponds) are some of the premier sites for observing waterbirds. The construction of sewage lagoons in recent decades, as a method of dealing with the treatment of water and sewage from rural communities, is thought to be responsible for the eastward breeding range expansion of some species of birds such as Ruddy Duck and Wilson's Phalarope. In addition, some of the rarest waterbird breeding records ever to occur in Ontario have been at sewage lagoons (e.g., Black-necked Stilt and Cinnamon Teal). Have you ever wondered what it is about sewage lagoons that make them so attractive to waterbirds?

Compared to other natural wetlands, such as beaver ponds, sewage lagoons are, in many ways, distinct (pun intended). With only a few exceptions, such as vultures and some seabirds, most bird species do not have a well-developed olfactory organ, so,



Sewage lagoons provide ideal breeding habitat for Wilson's Phalaropes. Les bassins de stabilisation des eaux usées fournissent un habitat de nidification idéal pour le Phalarope de Wilson. Photo: Jim Flynn

Every spring, thousands of birders partake in a favourite Canadian pastime – the “sewer stroll.”

unlike you or I, they are not repelled by the somewhat pungent odour that emanates from these manmade wetlands. However, the reason that so many bird species congregate at sewage lagoons is, in fact, directly related to the constant input of organic matter (human sewage). A wetland with a high organic base provides conditions particularly suitable for the production of many aquatic insects such as

midges. Midge larvae (also called bloodworms) are so numerous and concentrated during late spring on many sewage lagoons that the lagoon shoreline becomes crimson-red. With so many aquatic insect larvae, sewage lagoons are a favourite stopover site for shorebirds and waterfowl during spring migration as they feed on the exposed sludge flats and in the shallow water. Beginning in late May and early June, when larvae emerge as flying adults, a new, superabundant food supply suddenly becomes available to the large number of bird species that nest in the vicinity of sewage lagoons. For example, crane flies, midges, mosquitoes, and gnats, are a as



On sewage lagoons in eastern and southern Ontario, midges are the most abundant terrestrial and aquatic insect. Dans les bassins de stabilisation des eaux usées de l'est et du sud de l'Ontario, les moucherons sont les insectes terrestres et aquatiques les plus abondants. Photo: Michael Runtz



The only breeding record for Black-necked Stilt in Ontario was on a sewage lagoon. La seule mention de nidification d'Échasse d'Amérique en Ontario provient d'un bassin de stabilisation des eaux usées. Photo: Ron Ridout

preferred food item of many wetland-nesting songbirds such as Tree Swallows, and were reported to be more than five times as abundant at a sewage lagoon near Port Rowan, Ontario than in a nearby field habitat.

During spring and summer 2005, an undergraduate researcher from Carleton University in Ottawa, Ontario, collected data that provided additional insight into the diversity and abundance of arthropod taxa (mainly insects) found in and around sewage lagoons compared to other wetland



Eurasian Wigeon/ Photo: Harold Stiver

habitats. To compare terrestrial, aquatic, and aerial insect availability between sewage lagoons and beaver ponds (a common wetland type in eastern Ontario), arthropods were collected at least once weekly on two sewage lagoons and two beaver ponds using three methods: pyramidal nets, sweep nets, and aquatic insect nets. The results were surprising in that, irrespective of taxonomic Order, overall arthropod biomass (availability) was, on average, four times higher on sewage lagoons than on beaver ponds during the period when most waterbirds and marsh-nesting songbirds were breeding. With the exception of the Order *Odonata* (dragonflies and damselflies), which prefers clearer water, the biomass of each arthropod taxonomic Order was higher on sewage lagoons than on beaver ponds (Table 1). As expected, midges (both adult and larvae) and their allies in the Order *Diptera* (flies) were more than twice as abundant on sewage lagoons than on natural wetlands. Surprisingly, biomass of the Orders *Homoptera* and *Hemiptera*, which include terrestrial insects such as leafhoppers and aquatic insects such as water boatman, were more than eight times higher on sewage lagoons than on beaver ponds.

Because insects are so plentiful on sewage lagoons in comparison to beaver ponds, birds that use sewage lagoons as stopover sites during spring migration, or breed there and raise young, should be able to capture more insects at a higher rate. Shorebirds, and to a lesser extent, waterfowl, normally build up fat reserves at stopover sites and spring staging areas during their northward migration. In fact, birders can regularly observe 18 or more shorebird species, and 17 or more waterfowl species during a “sewer stroll” in eastern Ontario. Many species of shorebirds depend upon these stopover sites for rest and to provide high quality nourishment that is needed to replace depleted energy reserves required for the next leg of their migration. Because of the enormous insect biomass available, as many as several thousand shorebirds can be found congregated on a single sewage lagoon. Similarly, spring staging habitats are vital stopover areas for migrating ducks and geese.

Wetland productivity during the spring also strongly influences the birds' reproductive success later on their breeding grounds. There is evidence that early-nesting female ducks contribute more young to the fall flight each year than those that typically nest later. The reason is that ducklings that hatch early in the breeding season have a better chance of survival, not only during the summer, but also during the subsequent fall and winter. Therefore, it is reasonable to assume that high-quality, food-rich spring staging areas may allow hens to replenish nutrient reserves faster, move on to breeding areas and initiate nests earlier, and achieve greater reproductive success relative to lower-quality spring wetland habitat.

In addition to migratory birds that use sewage lagoons as stopover sites, many species breed at or near sewage lagoons to take advantage of the plethora of arthropods, which subsequently results in increased nestling and hatchling growth rate and survival. Wilson's Phalarope, a relatively rare species in eastern Canada, commonly nests at several sewage lagoons in eastern Ontario. In addition, an extensive study of Red-winged Blackbirds found that this species nests at densities four times higher on sewage lagoons than on beaver ponds because suitable nesting habitat (i.e., cattails) is often limited and also because adults can forage for super-abundant flying midges in close proximity to their nest. As a result, Red-winged Blackbird nestlings grow faster and fledge sooner at sewage lagoons than at beaver ponds.

Table 1. Dry mass (grams) of major arthropod orders sampled at sewage lagoons versus beaver ponds during spring and summer in eastern Ontario.

Tableau 1: Poids sec (grammes) des principaux ordres d'arthropodes échantillonnés pendant le printemps et l'été dans des bassins de stabilisation des eaux usées et des étangs de castor de l'est de l'Ontario.

Order/Ordre	Lagoon/Bassins	Pond/Étangs	% Difference/ Différence (%)
<i>Diptera</i>	0.6386	0.2721	+235
<i>Homoptera/Hemiptera</i>	1.6655	0.1926	+865
<i>Orthoptera</i>	2.2103	0.8362	+264
<i>Coleoptera</i>	0.3683	0.2047	+180
<i>Lepidoptera</i>	0.1969	0.1446	+136
<i>Arachnida</i>	0.1678	0.1468	+114
<i>Gastropoda</i>	0.0863	0.0432	+200
<i>Odonata</i>	0.2754	0.5247	-52



Research has shown that young birds raised at sewage lagoons grow faster than those raised in other habitats. La recherche a montré que les jeunes oiseaux élevés dans des bassins de stabilisation des eaux usées croissent plus vite que ceux qui sont élevés dans d'autres habitats. Photo: J. Ryan Zimmerling



Ruddy Duck/Érismature rousse Photo: Jim Flynn



Glossy Ibis/Ibis falcinelle Photo: Ron Ridout

With so many species of birds congregating and breeding at sewage lagoons during spring, summer, and fall, it is little wonder that “sewer strolls” have become a favourite pastime for birders. In many regions of Canada, it is possible to visit five or more sewage lagoons in a 100-kilometre radius, providing some of the most exciting and memorable birding opportunities. So, how does a birder find a sewage lagoon in their area? Birding guides and other birding resources on the internet are probably a good place to start. An equally valuable resource would be a local experienced birder who will be able to provide information and tips on how and when to access local sewage lagoons. Note, however, that most sewage lagoons in Canada occur on lands owned by the municipality and, for liability reasons, are often posted with No Trespassing signs and surrounded by fencing. Before entering, be sure to check with the municipal office to ensure that birders are permitted to access the sewage lagoons. In some cases, a seasonal pass may be purchased. Such is the case for one of the best-known sewage lagoons in eastern Canada – the Alfred Sewage Lagoon near Ottawa. This lagoon is unusual in that the emergent vegetation, primarily cattails, covers more than half of the surface area of one of the two ponds, which not only helps to naturally absorb the nutrients in the organic-rich sediment, but also provides excellent nesting habitat for many species of rails, bitterns, and ducks.

So, the next time you want to observe or photograph waterbirds, grab your family and friends and consider initiating your own sewer stroll. While non-birders may scoff at the idea of trudging around a manmade pond filled with raw sewage, let your nose guide you to a wetland where rare birds and birders flock.

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Pourquoi les oiseaux et les ornithologues amateurs affluent vers les bassins de stabilisation des eaux usées

Depuis des décennies, les ornithologues amateurs de toute l'Amérique du Nord savent que les bassins de stabilisation des eaux usées font partie des meilleurs sites d'observation des oiseaux aquatiques.

La raison pour laquelle autant d'oiseaux se rassemblent dans les bassins de stabilisation des eaux usées est directement liée à l'apport constant de matière organique (eaux usées humaines). Un milieu humide à contenu élevé en matière organique fournit des conditions particulièrement propices à la production de nombreux insectes aquatiques comme les moucheron. Les larves de moucheron (auss appelées vers de vase) sont tellement nombreuses et concentrées à la fin du printemps dans de nombreux bassins de stabilisation des eaux usées que le bord du bassin devient rouge cramoisi. Avec un aussi grand nombre de larves d'insectes aquatiques, ces bassins font partie des aires de rassemblement favorites des oiseaux de rivage et des oiseaux aquatiques qui s'y alimentent sur les platiers vaseux exposés ou dans l'eau peu profonde pendant la migration printanière.

Pendant le printemps et l'été 2005, un chercheur de premier cycle de l'Université Carleton à Ottawa (Ontario) a recueilli des données qui enrichissent nos connaissances sur la diversité et l'abondance des taxons d'arthropodes (principalement des insectes) que l'on trouve dans les bassins de stabilisation des eaux usées ou aux environs comparativement à ceux qui fréquentent d'autres habitats de milieu humide. Les résultats étaient surprenants en ce sens que, indépendamment de l'ordre taxinomique, la biomasse totale des arthropodes était en moyenne quatre fois plus grande dans les bassins de stabilisation des eaux usées que dans les étangs de castors pendant la période de reproduction de la majorité des oiseaux aquatiques et des oiseaux chanteurs qui nichent dans les marais.

Avec un aussi grand nombre d'espèces d'oiseaux qui se rassemblent et nichent dans les bassins de stabilisation des eaux usées au printemps, en été et à l'automne, il n'est pas surprenant que ces sites soient devenus des destinations populaires pour les ornithologues amateurs. Dans



Un bassin de stabilisation des eaux usées typique dans l'Ontario, avec de la végétation émergente clairsemée.
A typical sewage lagoon in Ontario with sparse emergent vegetation. Photo: Ron Ridout

de nombreuses régions du Canada, il est possible de visiter cinq bassins ou plus dans un rayon de 100 kilomètres, ce qui crée des possibilités d'observation comptant parmi les plus excitantes et les plus mémorables.

Alors, comment un observateur amateur peut-il trouver un bassin de stabilisation dans son secteur? Les guides d'ornithologie et les autres ressources en ornithologie offertes sur Internet sont probablement un bon départ. Une autre ressource tout aussi précieuse serait un observateur expérimenté de votre localité qui pourrait vous renseigner et vous conseiller sur l'accès aux bassins de stabilisation locaux et les moments propices. Il convient toutefois de noter qu'au Canada la plupart de ces bassins se trouvent sur des terres municipales et que, pour des raisons de responsabilité, ils sont souvent entourés de clôtures munies d'affiches interdisant d'y entrer. Avant de traverser une clôture, vérifiez avec le bureau de la municipalité si les ornithologues amateurs ont le droit d'accéder aux bassins de stabilisation des eaux usées. Parfois, on peut acheter une laissez-passer saisonnier. C'est le cas de l'un des bassins de stabilisation des eaux usées les plus connus de l'est du Canada, la lagune d'Alfred près d'Ottawa. Cette lagune est atypique en ce sens que la végétation émergente, principalement des massettes, couvre plus de la moitié de la superficie de l'un des deux étangs. En plus de faciliter



Aigrette tricolore/Tri-colored Heron
Photo: Ron Ridout

des sédiments riches en matière organique, ce couvert végétal fournit un excellent habitat de nidification pour de nombreuses espèces de râles, de hérons et de canards.

Alors, la prochaine fois que vous voudrez observer ou photographier des oiseaux aquatiques, rassemblez votre famille et vos amis et envisagez une randonnée autour du bassin de stabilisation de votre localité. Peut-être que les personnes qui ne font pas d'observation riront à l'idée de patauger autour d'un étang artificiel rempli d'eaux d'égout brutes, mais laissez votre nez vous guider vers un milieu humide où affluent les oiseaux rares et les observateurs d'oiseaux.

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