

Hyla Park: managing an amphibian conservation area in an eastern Canadian urban setting

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THE Gray treefrog, *Hyla versicolor* LeConte, has a wide distribution over the eastern United States and southeastern Canada. Since at least 1935 an isolated population, the most northeasterly for *H. versicolor*, has been known to occur at Fredericton in central New Brunswick, Canada. Bleakney (1958) suggested that this northern disjunct was the remnant of a much wider distribution during a post-glacial hypsithermal period, some 7,000–5,500 YBP. For many years a site at Barker's Point (45° 57' N 66° 37' W), Fredericton, provided habitat for the only population of *H. versicolor* known in Maritime Canada. With the site at Barker's Point under threat from encroaching development, the Gray treefrog was at one time proposed for protection under the New Brunswick Endangered Species Act (Majka, 1981). The Barker's Point population remains disjunct, although recent work has shown the species to have an expanding range in extreme southwestern New Brunswick (McAlpine *et al.*, 1991, McAlpine, 1997) and its status is now considered secure in the province.

It was in the context of protecting the most northeasterly North American population of the Gray treefrog that Hyla Park was established at Barker's Point by the Nature Trust of New Brunswick in 1995. Hyla Park consists of about 9 hectares of wetland and surrounding woodland within the municipality of Fredericton, a city with a population of about 50,000, and appears to be the first conservation area in Canada set aside specifically to protect an amphibian. Here we review and assess the first decade of efforts to manage the site, develop public programs, and protect the resident Gray treefrogs. Our experiences may be instructive for others who are

contemplating protecting wetland habitat with a focus on amphibians, especially where budgets are limited and volunteers integral.

Site Description

The Fredericton region sits on glacial deposits - alluvial surface sands overlie lacustrine clays and silts. Aerial photography shows that prior to 1941 Hyla Park was forested. Within a decade the site was cleared and alluvial deposits quarried for fill. Surface topography of the site is now generally flat with steep slopes at all four boundaries. On average, Hyla Park is now 4 m below the grade of surrounding properties. Where excavation has penetrated the water table, ponds and marshy areas have formed. Aerial photographs indicate most of these ponds developed after 1951. Recent bottom coring of ponds supports this, suggesting ponds range in age from 36–51 years (Cain, 2001). Re-vegetation of the site appears to date from the early 1970's (Jacques Whitford, 1995). Wetlands within Hyla Park are now dominated by *Typha latifolia* L., *Carex* spp., *Alnus incana* L., and *Salix* spp. Old field habitat bordering ponds has been increasingly overtaken by a mixedwood overstory of *Populus tremuloides* Michx, *Betula papyrifera* Marsh, and *Abies balsamea* (L.) and an understory of *Poacea* spp., *Compositae*, and various bryophytes (Cain 2001). Including the Gray treefrog, 75% of the amphibian species native to Maritime Canada occur at Hyla Park; *Ambystoma maculatum* (Shaw), *A. laterale* Hallowell, *Notophthalmus viridescens* (Rafinesque), *Plethodon cinereus* (Green), *Pseudacris crucifer* Wied, *Rana catesbeiana* Shaw, *R. clamitans* Latreille, *R. pipiens* Schreber, *R. sylvatica* LeConte, and *Bufo americanus* Holbrook are all common to abundant.

Several provincially rare plants, including *Agalinus tenuifolius* (Vahl.), *Gratiola neglecta* Torr., and *Polygala sanguinea* L., have also been documented to occur in the Park.

Although quarrying for gravel was the principal commercial activity taking place at the site before the establishment of Hyla Park, from about 1964–1968 the property supported a stock car racing track and associated structures, and there has been some dumping of soil and rock debris. The city of Fredericton also used the property as a disposal site for elms (*Ulmus americana*) removed during the municipal Dutch Elm Disease Control Program. Although residential development, including a trailer park, has increased on several adjacent properties since the early 1970's, Hyla Park remains connected to some large forested areas. An abandoned railway line, now the Gibson Walking Trail, skirts the northern border of the Park.

Hyla Park Development and Management

Using the publication *Critical Natural Areas in New Brunswick* (Dionne *et al.*, 1988) as the basis for a 1988 review, the Fredericton Planning Department identified Barker's Point as an environmentally significant site within the city's boundaries. Independently, Vail approached the City in 1991 about protecting the site, which was municipal property, with the result that city officials contacted the Nature Trust of New Brunswick. The Nature Trust, a non-profit charitable organization, operates with a paid Executive Director, paid staff on various projects as funds permit, and a volunteer Board of Trustees. As of 2005 the Trust oversees 23 properties totaling 868 hectares, all of special ecological significance to New Brunswick.

During discussions in 1994–95, City officials agreed that the Trust would not be liable for any toxic contamination on the site which might originate from a nearby metal recycling facility and also agreed to provide park status for Hyla Park under city by-laws once the Trust declared the site a nature reserve. Additionally, the city agreed to protect the site against further dumping of refuse and all-terrain and other vehicle traffic, to install large boulders at all entrances, to provide a truck and personal to help with clean-up, and to

ensure that residents were informed of the new status for the site. Initially, the Trust managed the site under a 5 year lease with the municipality of Fredericton, which in 2000 was renewed for a further 10 years.

Prior to signing the lease the Trust engaged environmental consultants Jacques Whitford Limited to carry out a Phase 1 Environmental Site Assessment (ESA 1) of the Hyla Park site. The intent of an ESA 1 is to disclose environmental information and render an opinion, following a review of records, a site visit, and interviews with regulatory officials and others associated with the property and properties adjoining. In addition to providing a full history of commercial site usage, the ESA 1 suggested that there was potential for contamination of pond water and sediment at Hyla Park, especially with lead and PCB's, from the battery and metal recycling operation and from a former electrical transformer storage site. Petroleum storage tanks and associated contaminated soil had also been removed from an adjacent property in 1990 (Jacques Whitford, 1995).

As with all Trust properties, a volunteer Steward is responsible for monitoring the site and reporting annually. A Hyla Park Committee of four, including the Steward, oversee programs and maintenance of the property. Under the terms of the lease this Committee includes a member of the Fredericton Parks and Trees Division of Community Services. The City maintains garbage cans and a picnic table at Hyla Park, as well an entry kiosk, as part of the city's regular maintenance schedule. The Fredericton Trails Patrol helps monitor the approximately 1 km of trails that have been established within Hyla Park and under the lease agreement, where possible, the City works with the Nature Trust to carry out any development of the site. Nonetheless, this agreement also states that the City has no funds for development of Hyla Park and that the costs of development and programs will be the responsibility of the Trust. Although the lease obliges the Trust to maintain liability and property damage insurance on property and programs equivalent to no less than 2 million dollars, and allows the City to restrict or forbid work or

activity at the site it might deem inappropriate, the lease also states that the City will pay the property taxes.

Thirty-six months elapsed from the signing of the lease between the City and the Trust and the official opening of Hyla Park on 3rd October 1998, a community event attended by about 200 people. During that period 33 volunteers donated 364 hours of time; refuse was removed from the site, 400 donated trees were planted, over 1 km of self-guided trails, incorporating 13 numbered reference posts, was installed, an accompanying brochure was produced, and six entry signs were erected. A public meeting invited input from local residents on how the site should be protected and developed, encouraged volunteer participation, and billed the project as 'a new kind of community park'. The City poured a concrete base for an entry kiosk and four inmates from the New Brunswick Central Reformatory, a local minimum security institution, built the kiosk. On Arbour Day, a year before the Park opened, students from a local school planted 100 trees along the boundary of the Park where all-terrain vehicle (ATV) use on the Gibson Trail had lead to soil erosion. A grant of \$4,288 from the Shell Environmental Fund covered material costs that were not donated. Presentations to local Scout and other youth groups also helped ensure that the local community was aware of the activity at the site.

Since the official opening other initiatives have been undertaken by the Hyla Park Committee. In 1999 federal funding allowed the Trust to place a student interpreter in the Park for the summer. Hyla Park has also become the site of choice for the delivery of the wetland educational program, 'It's Not Easy Being Green', delivered by the New Brunswick Ducks Unlimited office to 200–300 students annually in May-June. A series of summer walks led by naturalists, advertised through the municipal tourism authority and emphasizing wetland conservation and the identification of amphibians, have been delivered, and a video about the Gray treefrog produced jointly with the New Brunswick Museum has been distributed to local schools. These latter two projects have encouraged people to visit the Park and make use of the self-guiding brochure and trail system. Park visitation is also encouraged through

its listing on a geocaching website. Under the auspices of the Committee a wildlife inventory has been ongoing and a draft long-term management plan for the site has been prepared, the latter as a thesis project by an undergraduate Forestry student from the University of New Brunswick (Cain, 2001). In 2002 the Nature Trust of New Brunswick was awarded the Silver Salamander Award for the Trust's work in establishing Hyla Park. This annual award, presented by the Canadian Amphibian and Reptile Conservation Network, recognizes efforts in Canada to conserve amphibians and reptiles and their habitats.

Management Challenges: It's not easy being green

The establishment of Hyla Park has not been without problems. Most of the trees planted by students for Arbour Day in 1997 were promptly stolen. The Trust has banned dumping, campfires, and ATVs in Hyla Park, and has posted these restrictions at the Park entrances. Nonetheless, the site has a long history of usage by local people for all three activities and it has proven impossible to enforce restrictions. However, this previous activity has left a network of roads and trails that have proven useful to the Trust in providing public access to the Park and developing the trail system. And ATV use at the site seems to be dropping off since the Park was established, with the monitoring Steward characterizing ATV traffic in Hyla Park in the past few years as light. Although refuse and fire pits may be unsightly, and ATV traffic may damage trails, these activities seem to have had no impact on numbers of Gray treefrogs calling at the Park. Signs of drinking, drug-use, and arson have been recorded. A stove was recently dumped into one of the ponds and annual volunteer clean-ups of the site have proven necessary. The more serious, and costly, problem has been continued vandalism to the kiosk and accompanying interpretive panel at the entrance to the Park. The best solution would be an on-site presence within the Park, but unfortunately this is not financially feasible.

Vandalism has included defacing and spray-painting signs, removing or burning self-guiding trail posts, and stealing the brochure holder. Increased police patrols in 2001 seem to have

reduced, but not eliminated, problems. Nonetheless, a decision was made to delay expanding the Hyla Park trail system due to the threat of vandalism. Reluctantly, a decision was made in 2003 to remove the kiosk and a large interpretive panel and substitute smaller more economically replaced signage. Instead of making free copies of the self-guiding brochure available at the Park entry, new signage has been erected with a phone number where further information and free copies of the self-guiding brochure can be obtained.

While the Park has provided more educational opportunities than anticipated, the commitment demanded of volunteers to ensure the success and continuing maintenance of the site has proven greater than expected. Trust Executive also recognize the need to re-invigorate the Hyla Park Committee, which has not met in the past several years. The draft management plan for the Park has noted that the gradual infilling of some ponds at the site may require dredging if ponds are to continue to provide habitat that is suitable both for egg-laying and hibernation for amphibians (Cain, 2001). This will be especially important for species such as *Rana catesbeiana*, *R. clamitans*, and *R. pipiens*, which hibernate on pond bottoms and have larvae which take more than a single season to reach metamorphosis at eastern Canadian latitudes. The problem is less of an issue for *Hyla versicolor*, a terrestrial hibernating, freeze-tolerant, species that is well adapted to breeding in ephemeral ponds. However, it may prove necessary to actively manage the site so as to maintain a mix of old-field and early successional woodland habitats in the Park. The past use of the Hyla Park site for dumping tree trunks and limbs from the Fredericton Dutch Elm Disease Control Program has left much coarse woody debris on the site. This has provided amphibian cover-habitat that may need to be replaced in the future. Finally, residential development is likely to increase on the northern and western borders of the Park. The recently completed draft management plan for Hyla Park has recommended that a 20 m forested corridor be established linking Hyla Park to the nearby

Nashwaak River, and thereby the vast wetlands of the Saint John River system (Cain, 2001).

DISCUSSION

Isolated, peripheral populations, often genetically distinct, are an important component of biodiversity. Small refuges like Hyla Park can therefore play an important role in conservation. Semlitsch (2000) has discussed the value of small, isolated wetlands in maintaining biodiversity and notes the loss of small wetlands may impede rescue effects at the metapopulation level for amphibians. Small wetlands are an important source of juvenile amphibian recruits and Semlitsch (2000) reports some of the highest amphibian diversities have been recorded in small wetlands. Habitat loss and degradation are the principal causes of amphibian declines in Canada (Weller & Green, 1997), as elsewhere. Still, some amphibian species are clearly more sensitive to habitat disturbance than others. The increasing isolation of Hyla Park over time could well reduce the diversity of the amphibian community at the site, especially those species most sensitive to the loss of nearby forested habitat, such as *Rana sylvatica* and the ambystomid salamanders. Conversely, *Hyla versicolor*, the species for which the Park was established, would appear to be particularly resilient to habitat disturbance and fragmentation (Kolosvary and Swihart 1999). Unfortunately, there are no abundance estimates for amphibians at Hyla Park and it is therefore difficult to assess the actual impact of protected status for the site on resident amphibian populations, beyond the fact that wetland habitat has been maintained. In the future it may be necessary for the Trust to manage the site with the entire amphibian community in mind. Hyla Park, through ease of access within an urban environment, has proven a popular site for wetland education programs. Nonetheless, in the long-term the Trust, with limited resources, may need to explore opportunities for partnering with other agencies or conservation groups in order to maintain its commitment to the Park. Apparent expansion in the range of the Gray treefrog provincially, the complexity of establishing a

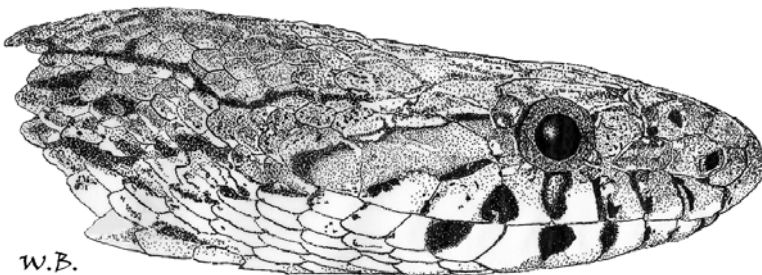
forested corridor to nearby natural wetlands, and the eventual need to dredge ponds and maintain wooded areas on the site in an early successional stage will all be considerations. It is also clear that stewarding groups like the Hyla Park Committee must remain active, but this often requires time and effort on the part of Trust employees. Together, these factors reinforce the need for Land Trusts to be cautious in taking on properties that will clearly require significant active management.

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Corn snake, *Elaphe guttata*. Illustration by Will Brown, produced from original photograph manipulated and enhanced using digital imaging software.

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