Wildlife habitat restoration in the Baie-du-Febvre region: Use by birds and anurans **prior to** management

2012 Activity Report

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Background


Red-winged Blackbird
Photo: Claudie Latendresse, 2006

The intensification of agricultural practices since the 1950s has led to a deterioration in the natural environments of southern Quebec. Streams have been straightened, wetlands have been drained, wooded areas have been cut down, and pastures and perennial crops have largely been converted to annual row crops, significantly reducing the amount of habitat available to many wildlife species (Latendresse et al. 2008; Rioux et al. 2009). A number of farmland bird species, such as the Bobolink, Eastern Meadowlark and Barn Swallow, have become rare in Quebec agricultural areas (NABCI 2012). These marked changes to the agricultural landscape have also been observed in the Lac Saint-Pierre floodplain (Richard et al. 2011), a highly productive, unique environment where perch populations are also in decline (Magnan et al. 2008) owing to habitat loss and wetland degradation.

To promote the recovery of populations of these declining species, wildlife habitat restoration projects have been taking place in the Lac Saint-Pierre floodplain since 2003 using the concept of cohabitation between agriculture and wildlife (Groupe de travail “intendance en milieu agricole : culture du littoral au lac Saint-Pierre” 2010). As such, habitat management work was carried out on three streams on the south shore of Lac Saint-Pierre in the fall of 2012 to restore fish habitat while allowing adjacent land to be farmed. In parallel with this work, an agroforestry plot was implemented at Ferme Bertco to demonstrate the wildlife and agronomic benefits of intercropping traditional crops (alfalfa, grains) with rows of trees of high-value species (oak, maple, walnut) spaced 40 m apart in the same field.

To obtain an overview of the wildlife communities present before the habitat management work was carried out, surveys of birds and anurans (frogs) were conducted in the weeks preceding the work. These data will form a basis for future monitoring activities in order to assess the long-term benefits of the habitat management work for these wildlife groups.

Restoration of a riparian buffer strip, Blondin sector.
Photo: © Comité ZIP du lac Saint-Pierre, 2012

Survey sectors

For the bird and anuran surveys, three sectors where habitat management has been carried out in 2012 were selected: 1) the Côté-Lefebvre/Brielle sector, which includes the Côté-Lefebvre streams north of Route 132 and the southwest branch of the Brielle River, which flows along Department of National Defence (DND) property; 2) the Blondin stream sector, located between Route 132 and the boundary of the DND property; and 3) a plot (8 ha) under agroforestry management, owned by Ferme Bertco, located east of Baie-du-Febvre between Route 132 and Chemin du Pays-Brûlé (Figure 1).

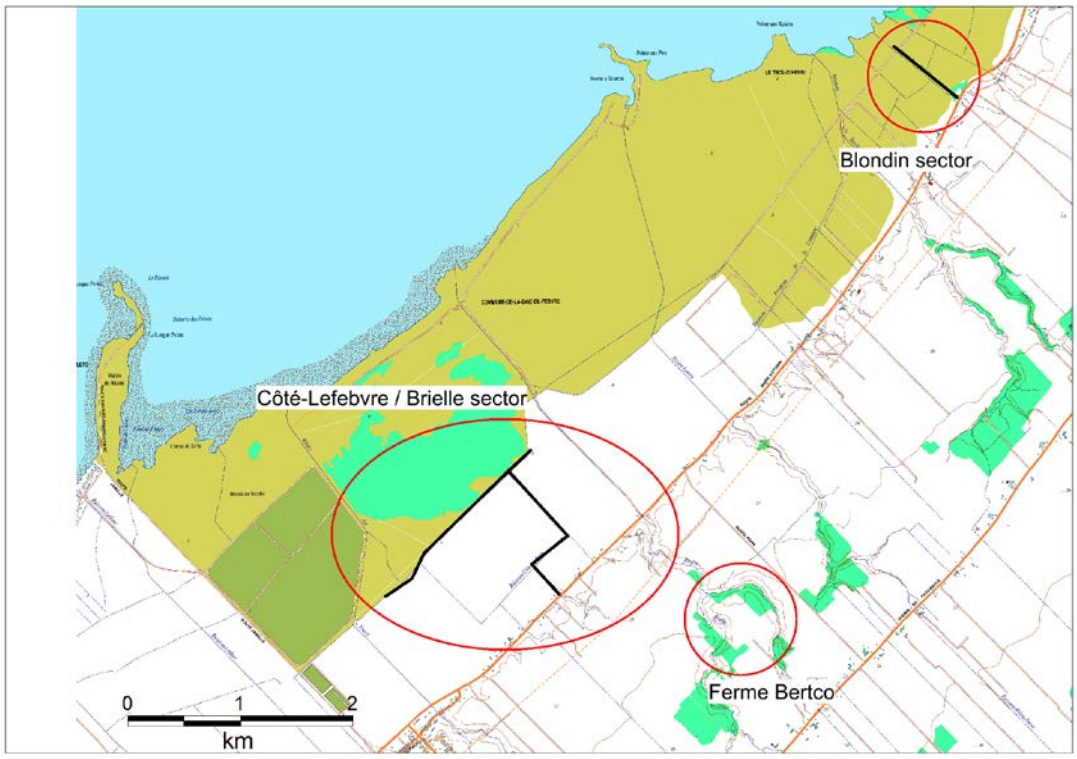

Figure 1. Location of sectors selected for the 2012 bird and anuran surveys.

Bird survey methodology

Birds were surveyed along the riparian buffers in the Côté-Lefebvre/Brielle and Blondin sectors. The survey consisted of performing a complete count of breeding birds by walking slowly (2–3 km/h) along the banks of streams and noting all birds seen and heard on the banks and in the riparian buffer, as well as up to 25 m on both sides of the stream in adjacent habitats (Deschênes et al. 1999; Jobin et al. 2001). The survey sectors were divided into sections approximately 200 m long, and the observer counted all individuals sighted in each section. Maps of the survey sites had been produced in advance, and the observer used the geographic coordinates on the maps to position himself in the field using GPS. For the Ferme Bertco site, the survey consisted of performing a complete count of breeding birds in the field by walking slowly along transects spaced approximately 100 m apart and marking, on a map of the site, the position of each individual observed (Jobin and Falardeau 2010).

For birds in all sectors, the species, sex, number of individuals, behaviour (e.g., alert, feeding, calling) and habitat use (stream and riparian buffer; cultivated field; old field, forest) were recorded. Low-flying foraging birds were included (e.g., swallows), but those flying high over the survey sites were not (e.g., gulls flying overhead). Three surveys were conducted at >7-day intervals (29 May, 5 June and 15 June). All three sectors were surveyed in the course of one morning. Surveys were conducted under favourable weather conditions (no heavy rains, light winds), began 30 minutes after sunrise, and were completed by 10:00 a.m.

Anuran survey methodology

The anuran survey protocol is based on the protocol used for the Quebec Amphibian Population Monitoring Program (Société d'histoire naturelle de la vallée du Saint-Laurent 2009). Point counts were positioned at 500-m intervals in the field so as to cover the entire survey area. The stations were visited repeatedly throughout the season, because anuran species do not all call during the same period. The survey consisted of identifying every anuran species heard at each listening station over a period of three minutes and assigning an abundance index to each species:

0. No calls

1. Individuals can be counted

2. Some individuals can be counted, while others overlap (no chorus)

3. Continuous, overlapping calls, and individuals are impossible to count (chorus)

Surveys began 30 minutes after sunset and were conducted under favourable weather conditions (light winds, light or no precipitation). The first survey took place on 11 April (Blondin sector, Ferme Bertco sector) and 19 April (Côté-Lefebvre/Brielle sector), while the second and third, covering all three sectors, took place on 15 May and 26 June, respectively.

Agroforestry plot at Ferme Bertco.
Photo: David Rivest, 2012

Results: Bird surveys

Côté-Lefebvre/Brielle sector

A total of 24 species were observed in the Côté-Lefebvre/Brielle sector, including 14 species in the riparian buffer and adjacent cultivated fields and 12 in the old fields on DND property (Table 1).

Table 1. Bird species observed in the Côté-Lefebvre/Brielle sector in the summer of 2012.

	Riparian buffer (including open water)				Adjacent fields				Old fields (National Defence)				
Species	29 May	5 June	15 June	Total	29 May	5 June	15 June	Total	29 May	5 June	15 June	Total	Total
American Goldfinch					3			3			1	1	4
American Robin					3	1		4			2	2	6
Barn Swallow	1			1									1
Black Tern			3	3									3
Brown-headed Cowbird		1		1	4			4					5
Common Grackle	1			1	5			5		1	2	3	9
Common Yellowthroat									4	1	2	7	7
Downy Woodpecker		1		1									1
Eastern Kingbird									1	1		2	2
Gadwall	1	1	4	6	3			3					9
Horned Lark						1	2	3					3
Killdeer					2	5	3	10					10
Mallard	2		1	3		40		40		2		2	45
Mourning Dove							3	3			1	1	4
Purple Martin	3			3									3
Red-winged Blackbird		5	3	8	12	3	6	21	17	19	44	80	109
Savannah Sparrow					1			1					1
Song Sparrow	6	6	6	18	6			6	5	7	22	34	58
Spotted Sandpiper	2		3	5	2	6		8					13
Swamp Sparrow		1	1	2					1	1		2	4
Tree Swallow	1		1	2		6	2	8					10
Willow Flycatcher											2	2	2
Wood Duck	2			2									2
Yellow Warbler									2	2	1	5	5
No. Individuals	19	15	22	56	41	62	16	119	30	34	77	141	316
No. Species	9	6	8	14	10	7	5	14	6	8	9	12	24

The most abundant species were the Red-winged Blackbird, Song Sparrow and Mallard. These three species accounted for more than 67% of all birds observed. Less than 18% (n=56) of the birds were observed along the riparian buffer, and the Red-winged Blackbird and Song Sparrow accounted for about half of those observations. Species observed only along the riparian buffer (Wood Duck, Black Tern, Purple Martin, Barn Swallow, Downy Woodpecker) were observed while foraging in the habitats and were not breeding.

The Song Sparrow was a confirmed breeder in the riparian buffer by the observation of adults carrying food for young. A number of species associated with shrub habitats (Willow Flycatcher, Yellow Warbler, Common Yellowthroat, Eastern Kingbird) were observed only in the old fields located on the DND property. Note that the second survey covered only one third of the west branch of the Brielle River, because deep water in the ditches prevented the observer from reaching the sections further west.

Blondin sector

In the Blondin sector, 16 species were observed, including 10 species in the riparian buffer and 11 in the adjacent fields (Table 2).

The most abundant species were the Common Grackle and Red-Winged Blackbird, which together accounted for 73% of all birds observed. A number of species observed in the riparian buffer and stream are associated with wetlands, such as the Wilson's Snipe, Swamp Sparrow, Mallard and Marsh Wren, while the adjacent fields in pasture offered habitat for farmland bird species (Savannah Sparrow, Bobolink).

Table 2. Bird species observed in the Blondin sector in the summer of 2012.

	Riparian buffer (including open water)				Adjacent fields				
Species	29 May	5 June	15 June	Total	29 May	5 June	15 June	Total	Total
American Robin	1			1	2			2	3
Baltimore Oriole						1		1	1
Barn Swallow							1	1	1
Bobolink						1	2	3	3
Common Grackle		1	4	5		1	75	76	81
Eastern Kingbird	1	1		2					2
European Starling						6		6	6
Mallard		2	2	4					4
Marsh Wren		1		1					1
Red-winged Blackbird	1	4	2	7	7	6	13	26	33
Savannah Sparrow					2		1	3	3
Song Sparrow		2	1	3					3
Swamp Sparrow	1	2	2	5	1			1	6
Tree Swallow		1		1					1
Warbling Vireo					1			1	1
Wilson's Snipe	1	1	3	5		2		2	7
No. Individuals	5	15	14	34	13	17	92	122	156
No. Species	5	9	6	10	5	6	5	11	16

A number of species were observed in the single isolated tree located on the banks of the stream, including the European Starling, Baltimore Oriole, Common Grackle (a group of 75 individuals during the third survey) and Warbling Vireo. Breeding was not confirmed for any species in this sector.

Ferme Bertco

A total of 15 species were observed in the agroforestry plot at Ferme Bertco, including 7 species in the managed field and 14 in adjacent habitats (cultivated fields, deciduous forest, hedgerows) (Table 3).

Table 3. Bird species observed at Ferme Bertco in the summer of 2012.

	Managed fields				Adjacent habitats				
Species	29 May	5 June	15 June	Total	29 May	5 June	15 June	Total	Total
Alder Flycatcher						1		1	1
American Goldfinch		2		2	2		1	3	5
American Robin	3			3	1		1	2	5
Blue Jay						1	1	2	2
Brown-headed Cowbird	2	1		3	1	1	3	5	8
Common Yellowthroat					1	2	2	5	5
Eastern Kingbird					1			1	1
European Starling	1			1		4	2	6	7
Great Crested Flycatcher							1	1	1
Killdeer	6	4		10			2	2	12
Red-eyed Vireo						1		1	1
Song Sparrow	1	6	1	8	1	1	4	6	14
Vesper Sparrow	4	3	3	10					10
Yellow Warbler						1		1	1
Yellow-bellied Sapsucker							1	1	1
No. Individuals	17	16	4	37	7	12	18	37	74
No. Species	6	5	2	7	6	8	10	14	15

The most abundant species in the managed field were the Vesper Sparrow, a species associated with well-drained fields, Killdeer, which was confirmed as breeding by the observation of numerous fledglings, and Song Sparrow. These three species accounted for more than 75% of birds observed in the managed field. Many species associated with shrub and forest habitat, such as the Blue Jay, Alder Flycatcher, Yellow Warbler, Common Yellowthroat, Yellow-bellied Sapsucker, Great Crested Flycatcher, Eastern Kingbird and Red-eyed Vireo, were observed only on the edges of the managed field. A few species, such as the Mourning Dove, Common Grackle and Red-winged Blackbird, were observed flying over the site without stopping.

Results:
Anuran surveys

Côté-Lefebvre/Brielle sector

Four species were detected along the west branch of the Brielle River (Figure 2). The American Toad and Northern Leopard Frog were highly abundant during the first survey, while only a few Wood Frogs were present. The Green Frog appeared later in the season (second and third surveys). Approximately 90% of the individuals heard along the southwest branch of the Brielle River were located on the DND property. The American Toad was the only species heard along the Côté-Lefebvre stream during the first visit.

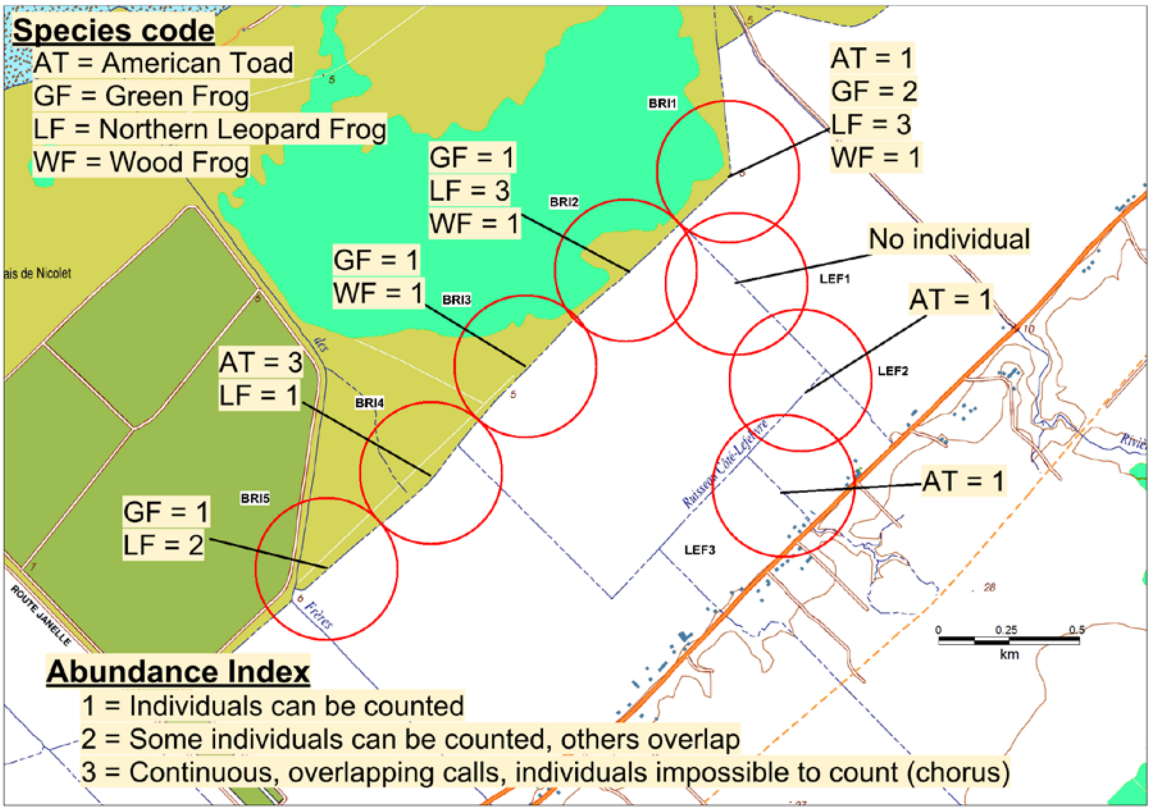

Figure 2. Maximum abundance index for anuran species detected in the Côté-Lefebvre/Brielle sector in 2012.

Blondin sector

Only a few individuals of three anuran species, namely the American Toad, Northern Leopard Frog and Green Frog, were detected during the second and third surveys in the Blondin stream sector (Figure 3).

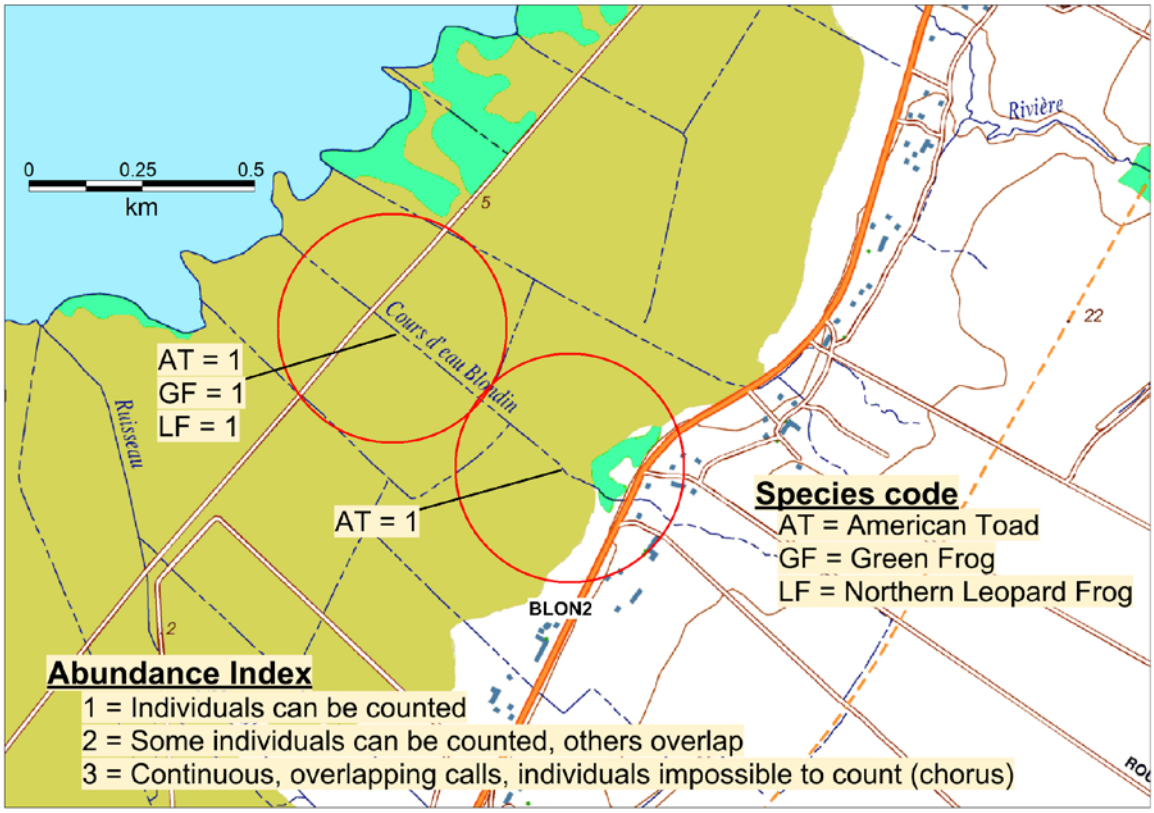

Figure 3. Maximum abundance index for anuran species detected in the Blondin sector in 2012.

Ferme Bertco

No individual was detected in any of the three surveys in the Ferme Bertco sector, either in the managed field or in adjacent habitats.

Discussion and project follow-up

Since the surveyed sites were primarily bordered by annual row crop fields, the low diversity of bird and anuran communities inhabiting these habitats is not surprising. However, the presence of the Bobolink in the pasture adjacent to the Blondin stream is noteworthy because populations of that species are in steep decline across North America. A number of species associated with shrub habitat were also observed in the areas surrounding the managed sites, such as the DND property in the Côté-Lefebvre/Brielle sector and the woodlands adjacent to the managed field at Ferme Bertco. These habitats are favourable for shrub- and tree-nesting species, and the growth of the shrubs and trees planted in the restored habitats is expected to offer high-quality habitat for multiple species in the years to come. The results of this study will form a basis for monitoring the birds and anurans that use the managed habitats; similar surveys should be conducted in future years to determine whether the birds and anurans have responded positively to these habitat management works.

The efforts made to restore wildlife habitats along the riparian buffers in the Lac Saint-Pierre floodplain are promising. These works will help maintain wildlife populations while improving water quality and landscape diversity. However, a large-scale return to pastureland and perennial crops, combined with farming practices favourable to the species that use such habitat, would help to reverse the decline observed in these populations.

Furthermore, the implementation of an agroforestry plot provides new wildlife habitat while diversifying local agricultural production. It is to be hoped that this initiative will be emulated in other parts of the agricultural plain of Lac Saint-Pierre and southern Quebec.

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