# STATE of the STRAIT

# ECOLOGICAL BENEFITS OF HABITAT MODIFICATION

## DETROIT RIVER AND WESTERN LAKE ERIE

2010

**Cover photos:** DTE's River Rouge Power Plant in Michigan by Chris Lehr/Nativescape LLC; Lower left: Legacy Park in Windsor, Ontario by Essex Region Conservation Authority; Lower middle: Elizabeth Park in Trenton, Michigan by Emily Wilke/Detroit River International Wildlife Refuge; Lower right: Fort Malden in Amherstburg, Ontario by Essex Region Conservation Authority.

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# 5.11 The Southern Flying Squirrel (*Glaucomys volans*) at Point Pelee National Park: Conservation Efforts, Habitat Modifications, and Biological Results

## Introduction

Southwestern Ontario is considered one of the most deforested areas in Canada (Kerr and Cihlar 2004). With less than 6% of forest cover, the remaining ecosystems struggle to survive in small, fragmented, isolated and stressful environmental conditions. The once dominant and extensive Carolinian Forest Zone in the southernmost natural region of Canada is now confined to a few protected areas. This region has a high density of endangered species and many have already disappeared (Kerr and Cihlar 2004). The southern flying squirrel (*Glaucomys volans*), a typical animal component of the Carolinian zone, was extirpated from the Essex region by 1940 as a result of the dramatic substitution of mature deciduous forest to extensive agriculture and cottage development.

In this extended abstract, we present a synthesis of the conservation efforts coordinated by the Parks Canada Agency/Point Pelee National Park to protect and recover the flying squirrel from regional extinction by: 1) protecting and restoring Point Pelee's deciduous forest; 2) reintroducing the flying squirrel into the park; and 3) sustaining scientific research and implementing an ecological integrity monitoring program.

*Figure 1. Hundreds of cottages were removed from Point Pelee National Park to promote the regeneration of the unique Carolinian forest and associated biodiversity. Photo credit: Parks Canada archives.*

## Methods

*Protecting and restoring Point Pelee's deciduous forest*

Point Pelee National Park was established in 1918 to protect significant natural resources and ecological processes. The park consists of 420 hectares (1,039 acres) of Carolinian forest and 1070 hectares (2,644 acres) of freshwater marsh. However, early protection did not insulate Point Pelee from the intensive development pressures of southern Ontario. By the 1950s, hundreds of cottages and extensive farming areas were developed within the park's boundaries. Recreational activities also increased with detrimental consequences for the local flora and fauna. As a response to the accelerated deterioration the park was suffering, by the mid-1960s, a conservation-directed management regime became more prevalent and an active program of cottage and roads removal and the cessation of extractive activities was initiated (SoPR 2006) (Figure 1). By using geographic information systems (ArcInfo, ver. 9), a series of images (aerial photography from 1931, 1977 and Landsat satellite images from 2004) were analyzed to understand the change in mature deciduous forest cover between 1931 and 2004.

Following demolition and removal, diverse sites in the park were left undisturbed and allowed to regenerate in what is called *passive restoration* (McLachlan and Bazely 2003).

*Active restoration* has been implemented as well since 1988 by the removal of nonnative species, the reconstruction of former topography and hydrology, and the planting of native tree species.

*Reintroducing the flying squirrel into the park*

Point Pelee National Park decided to assume the responsibility of reintroducing the flying squirrel as part of its mandate to restore the Carolinian forest and biodiversity components. With diverse allies like the Friends of Point Pelee, Pelee Island Winery and the University of Guelph, 99 individuals of the flying squirrel were collected from the Haldimand-Norfolk region (200 km east of Point Pelee) and released in the park between 1993 and 1994. A combination of nest boxes and feeders were used to facilitate the reintroduction of the species to the Pelee park (Figure 2). For technical details on the reintroduction of the flying squirrel, please see Adams and Nudds (1993).

*Figure 2. A nest box occupied by a flying squirrel in Point Pelee National Park. Photo credit: Parks Canada archives.*

*Sustaining scientific research and implementing an ecological integrity monitoring program*

Since the reintroduction of the flying squirrel to Point Pelee, diverse research programs and monitoring efforts (mostly biennial) have been implemented in collaboration with the University of Guelph to evaluate the population growth and genetic condition of the introduced squirrels (Adams 1997; Bednarczuk 2000, 2002, 2003; Bednarczuk and Stephens 2004; Parks Canada 2007, 2008). A mark-recapture program was established to monitor the squirrel's population after its reintroduction. By using trapping grids and lines (4–6) with Sherman small-mammal live traps (5–10 traps each) for five nights every two weeks for three months (June–August), an estimate of the flying squirrels' abundance is presented in Figure 3.

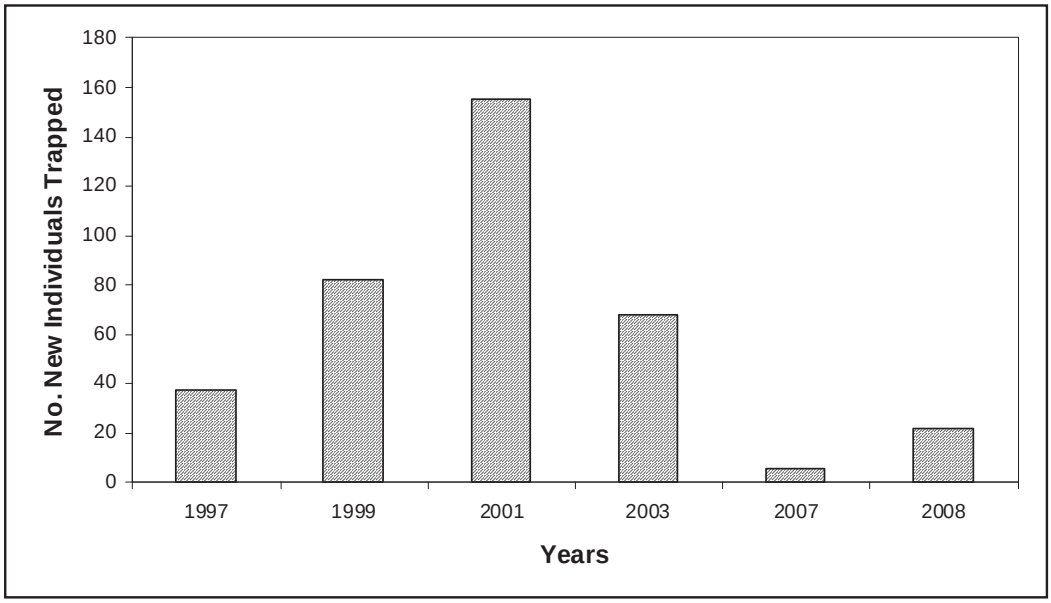


*Figure 3. Number of new individuals of flying squirrels trapped in Point Pelee National Park for the last ten years.*

## Results and Discussion

*Protecting and restoring Point Pelee's deciduous forest*

Results indicate that the restoration efforts in Point Pelee National Park have allowed the flying squirrel's habitat to increase in area extent and on appropriate vegetation conditions, such as higher densities of mature trees and tree cavities. Point Pelee's deciduous forest increased from 20 hectares (49 acres) in 1931 to 214 hectares (529 acres) in 2004.

*Reintroducing the flying squirrel into the park*

The squirrel showed positive population growth in the years following the reintroduction. By 2001, the population had increased to 591 individuals or near 70% of the carrying capacity estimated for the population (Bednarczuk 2003). However, a decline in the squirrel population was detected in 2003 and it was most likely due to environmental factors, including the 2002 drought and cold winter in 2003 (Bednarczuk 2004, p. 17). For the surveys of 2007–2008, the detected numbers of new individuals were low again. Further research is being undertaken (e.g., to establish population thresholds) to investigate if the squirrel population may be declining or just fluctuating (very likely due to demographic and environmental factors) and has yet to stabilize (SoPR 2006), or if the reduced sampling effort from the last two years has had an impact on the flying squirrel abundance estimation.

*Sustaining scientific research and implementing an ecological integrity monitoring program*

In collaborative research with York University, McLachlan and Bazely (2001, 2003) investigated the outcomes of forest restoration at Point Pelee by comparing the understory plant communities in 28 restored sites with controls in less disturbed forests. These authors demonstrated the effectiveness of restoration efforts by finding a significant increase in the similarity of the plant assemblages of the restored sites to the controls.

## Conclusions

The protection and restoration of Point Pelee's deciduous forest can be considered successful, as native plant communities have returned to the park and improved forest conditions facilitated the reintroduction and viability of the flying squirrel.

Monitoring of the established flying squirrel population continues and is in the process of being improved and integrated with other measures (for example, tree health) to better understand the species' habitat requirements and future forest management needs, if any; and also to evaluate and learn from this species' reintroduction experience. The flying squirrel is currently considered a monitoring measure for the park's forest indicator.

The flying squirrel represents an opportunity to communicate relevant ecological information to the public, but also an opportunity to engage people in community-based monitoring activities and in the end, reintroduce *people* into Nature.

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