

# JANUARY INITIATION OF SUBURBAN GREAT HORNED OWL NESTS IN MANITOBA

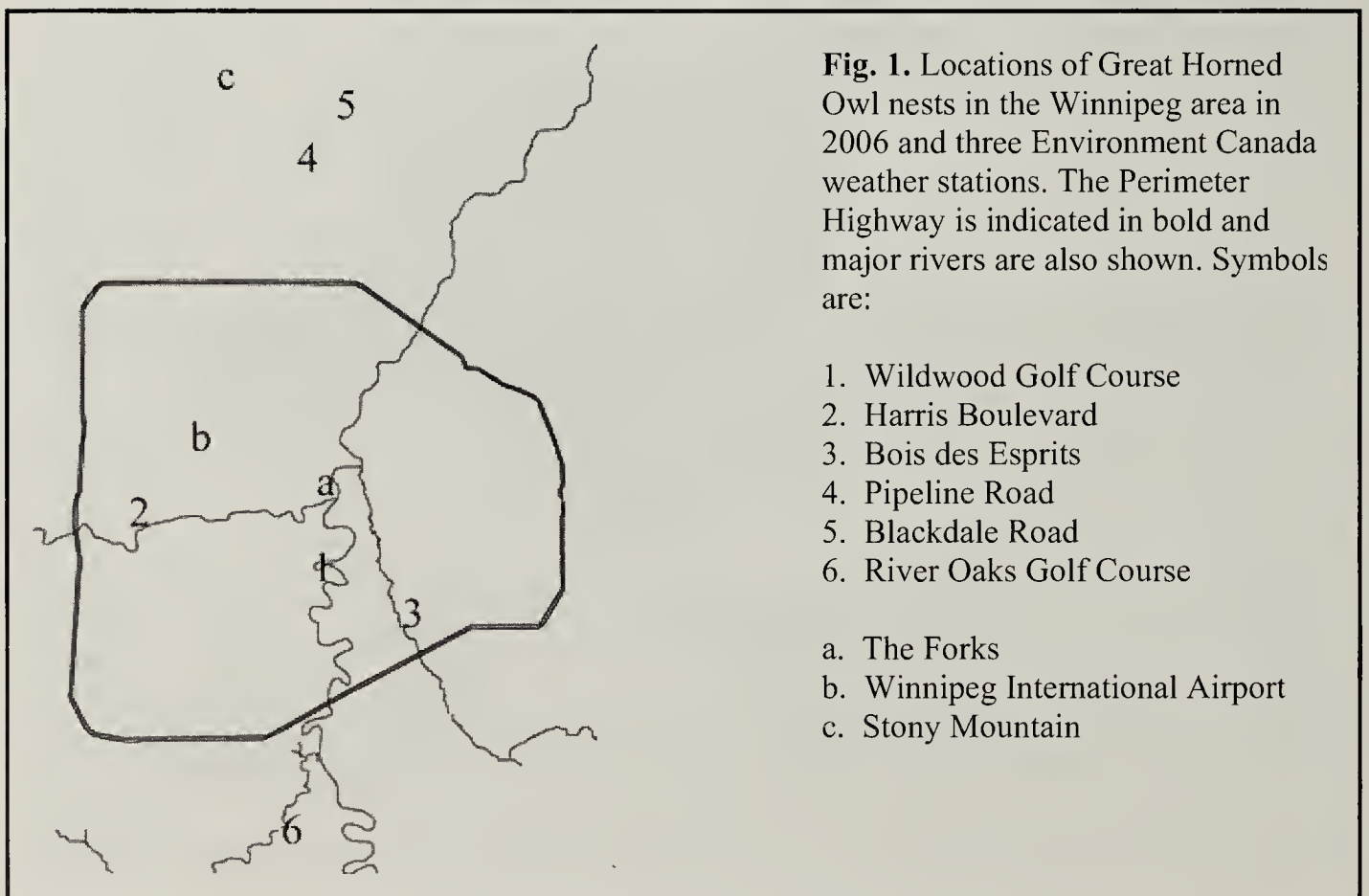
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In 2006, two Great Horned Owl pairs began nesting in suburban areas of Winnipeg, Manitoba in mid-January, approximately five to six weeks earlier than any previously recorded breeding date in that province.<sup>5</sup> Comparison with rural Great Horned Owl nests nearby suggests that the urban heat island phenomenon, in combination with above average January temperatures, may have triggered these extremely early nesting efforts.

The first of these two nests was on the edge of Wildwood Golf Course, a suburban golf course near the Red River (Figures 1 and 2). Two chicks fledged. The older left the nest on the

evening of March 30 and flew from the nest tree on March 31 (Figures 3, and 4 & 5 on the inside front cover). The younger chick left the nest on April 2 but remained in the nest tree until April 8. Based on the average incubation period of 33 days and the average period in nest of 42 days,<sup>7</sup> I estimate the date of clutch initiation to be January 15. The adult male apparently died shortly before the young fledged (D. Swayze, pers. comm.).

The second nest was located on Harris Boulevard, a suburban street along the edge of a golf course near the Assiniboine River. This is the only pair discussed in this article that nested



**Fig. 1.** Locations of Great Horned Owl nests in the Winnipeg area in 2006 and three Environment Canada weather stations. The Perimeter Highway is indicated in bold and major rivers are also shown. Symbols are:

1. Wildwood Golf Course
  2. Harris Boulevard
  3. Bois des Esprits
  4. Pipeline Road
  5. Blackdale Road
  6. River Oaks Golf Course
- a. The Forks  
b. Winnipeg International Airport  
c. Stony Mountain





*Figure 2. Adult bringing eastern cottontail to young in the nest at Wildwood Golf Course on March 24, 2006.*

in a conifer. Two chicks fledged in the second week of April. I estimate clutch initiation for this pair to be January 23, which is consistent with the observations of local residents.

A third seemingly early nest was located in the Bois des Esprits, a patch of riparian forest on the Seine River near a new suburban housing development. The female was observed sitting on the nest from February 21 to March 21, with the male in attendance nearby; however, the owls were not seen near the nest in early April and no further

information could be gleaned. Other Great Horned Owl nests in rural areas outside Winnipeg exhibited more typical phenology, producing fledged young in late May or early June, indicating laying in early or mid-March. None of 24 nests located in prairie and aspen parkland habitat in southwestern Manitoba during late April and early May of 2006 appeared early (K. De Smet, pers comm.). The locations and dates of nests in and near Winnipeg are summarized in Table 1. Locations are illustrated in Figure 1. All these nests produced two young,



except the Bois des Esprits nest for which the reproductive output is not known.

January 2006 was the warmest January ever recorded in Winnipeg (recording began in 1873) and in 14 other locations in Manitoba (D. Marciski, pers. comm.). The average temperature in Winnipeg in January 2006 was  $-7.4^{\circ}\text{C}$ , which is more than  $10^{\circ}\text{C}$  warmer than the long-term average of  $-17.8^{\circ}\text{C}$ , and more than  $3^{\circ}\text{C}$  warmer than the highest previously recorded January average of  $-10.6^{\circ}\text{C}$  set in 1944.<sup>3</sup> In 2006, temperatures were consistently well above normal throughout January, with only one day between December 21 and January 31 below normal. Minimum temperatures were especially high throughout the month, falling below  $-20^{\circ}\text{C}$  on only three days of the month, and falling below the long-term average minimum temperature of  $-22.8^{\circ}\text{C}$  on only one day of the month (January 22, minimum of  $-32.9^{\circ}\text{C}$ ).<sup>3</sup> The maximum temperature was above  $-5^{\circ}\text{C}$  on 24 days of the month.<sup>3</sup>

Exceptionally warm January temperatures were likely influential in the case of these early nests. Although the small sample size and the absence of highly localized weather data preclude statistical analysis, comparisons of fledging dates and average temperatures in suburban and rural areas point to the urban heat island (in combination with the unusually warm January) as an important factor in producing the differences noted in clutch initiation. To further investigate this possibility, I used the data from the 273 nest cards from Manitoba for Great Horned Owl in the Prairie Nest Record File to calculate clutch initiation dates. Egg dates were taken to indicate clutch initiation, (even though the eggs may have been laid previously), unless

fledging dates provided a more accurate estimate. Records of “well-incubated” eggs, sitting owls without other data, and larger downy young were not included in any calculations, as estimating the onset of laying would have been too difficult. The dates I calculated therefore represent the latest possible clutch initiation, a conservative estimate rather than a precise measurement. Details of the nests with the 10 earliest clutch initiation dates are provided in Table 2.

There are 95 nest cards from Manitoba for which an estimate of clutch initiation is possible. Based on these, the average latest clutch initiation date is April  $1 \pm 2.2$  days (standard error of the mean). The average of the nine records from Winnipeg is March  $19 \pm 9.4$  days. The actual average clutch initiation dates are likely to be earlier for the reasons discussed above. There are six records of clutch initiation in February in the nest record file (not including the 2006 nests described above), the earliest being February 18. The fact that four of these six (67%) records are from Winnipeg, when only nine of the 95 (9%) nest records are from that city, further suggests the importance of the urban heat island effect. Of the six February clutch initiation records, four were in years with above average February temperatures and data for one year are lacking. The two earliest records were in years that were approximately  $7^{\circ}\text{C}$  above average. This also suggests temperature acts as a trigger for egg-laying.

I also compared data on winter snowfall and snow thickness from Environment Canada weather stations for the three early nests in 2006 and the 10 earliest records from the Prairie Nest Record File, summarized in Table 3.



Nine of the 10 nests for which there were data on total winter snowfall were at locations, and in years, with 3.6 – 40.8 cm less than average snowfall. The only early nest with above average snowfall was in Assiniboine Park, Winnipeg in 1987 (3 cm above average). The amount of snow that remains on the ground probably has more biological significance to the owls and their prey than snowfall per se and, for five of the six nests where data were available, the snow on the ground on the last day of February was 11 – 25 cm less than average. The 1987 Winnipeg nest again provides the only exception. Unfortunately, more useful data, such as average snow thickness prior to clutch initiation, were not obtainable. These data suggest that snow thickness, which may be correlated

with temperature, may also be a factor in determining nesting phenology. Prey availability, another potentially influential factor, could not be evaluated.

The phenomenon of early nesting by Great Horned Owls in response to warm winter temperatures has been reported from elsewhere in North America, e.g. New York and Wyoming.<sup>2,9</sup> Great Horned Owls initiated a clutch on approximately December 22, 2001 at an international airport in Montana.<sup>6</sup> Above average November and December temperatures and artificial lighting at the airport may have been factors in this early nesting.<sup>6</sup> None of the early nests in Winnipeg, 2006 were in well-lit areas, though there were a few street lamps nearby in each case.



Figure 3. “Branching” young at Wildwood Golf Course on March 31, 2006.



**Table 1.** Location and dates of Great Horned Owls nests in 2006 from Winnipeg and surrounding area.

Location	Distance to City Centre - Habitat	Mean T Jan 2006	Long-term Jan Mean T	Laying	Branching	Fledging
Wildwood GC	3.8km - sub GC	F: -6.3	N/A	Jan 15	03/30, 04/02	03/31, 04/08
Harris Blvd	10.3km - sub GC	A: -7.4	-17.8	Jan 23	04/08, 04/10	04/08, 04/14
Bois des Esprits	9.9km - sub rip	A: -7.4	-17.8	< Feb 21	Unknown	Unknown
Pipeline Rd	16.5km - rural ag	S: -7.8	-18.0	Mar 8	05/20, 05/21	05/22, 05/24
Blackdale Rd	24.5km - rural ag	S: -7.8	-18.0	Mar 17	05/28, 05/29	05/31, 05/31
River Oaks GC	19.1km - rural GC	S: -7.8	-18.0	Mar 22	05/31, 06/01	06/05, 06/09

T = temperature in degrees Celsius from the nearest Environment Canada weather station.<sup>3</sup> Where no nearby weather station was available, a station of a similar distance from the city center was selected. Weather stations are indicated under the Mean T Jan 2006 column as follows: F: The Forks; A: Winnipeg International Airport; and S: Stony Mountain. Laying dates are estimated from fledging dates as described in the text. Branching refers to the first day an owlet left the nest but remained perched in the nest tree, although some occasionally returned to the nest for brief periods. Fledging here refers to the date when the owlets left the nest tree for the first time. Other abbreviations: ag = agricultural, Blvd = boulevard, GC = golf course, rip = patch of riparian forest, sub = suburban.

**Table 2.** The 10 earliest records of egg laying by Great Horned Owl in Manitoba from the Prairie Nest Record File with mean February temperatures (°C) from the respective years.

Date	Observation	Mean T Feb	Long- term Feb Mean T	Diff	Location	Latest Clutch Initiation
1987 May 1	3 chicks; fledged May 4– 7	A: -6.5	-13.6	7.1	Wpg, Assiniboine P	Feb 18
1984 Mar 20	incubating; 1 fledged May 12	A: -6.8	-13.6	6.8	Wpg, King's P	Feb 26
1925 Feb 28	2 eggs	V: N/A	-12.2	N/A	near Hartney	Feb 28
1981 Feb 28	incubating	S: -10.0	-13.8	3.8	Birds Hill PP	Feb 28
1982 Feb 28	incubating	A: -14.5	-13.6	-0.9	Wpg, Fort Whyte	Feb 28
1983 Feb 28	incubating	A: -10.5	-13.6	3.1	Wpg, Fort Garry	Feb 28
1960 Apr 2	2 chicks	A: -13.9	-13.6	-0.3	Wpg, Assiniboine P	Mar 1
1978 Apr 6	chicks	O: -14.5	-13.4	-1.1	Woodworth	Mar 4
1927 Apr 9	2 chicks, 1 just hatched	Fr: -18.1	-15	-3.1	Teulon	Mar 7
1981 Mar 7	incubating; 2 chicks in April	V: -11.0	-12.2	1.2	Reston	Mar 7

Diff = the difference between the mean February temperature and the long-term average. Weather stations: A: Winnipeg International Airport; Fr: Fraserwood, O: Oakner, S: Stony Mountain, and V: Viriden. Other abbreviations: P = Park, PP = Provincial Park, and Wpg = Winnipeg. The mean February temperature for Fraserwood in 1927 is an estimate.<sup>3</sup>

**Table 3.** Location and dates of the 13 earliest Great Horned Owls nests reported from Manitoba with data on winter snowfall (cm) and snow on ground (cm) on last day of February from the respective years.

<b>Location and Year</b>	<b>Latest clutch initiation</b>	<b>Total winter snow</b>	<b>Mean winter snow</b>	<b>Diff snow-fall</b>	<b>Snow on ground</b>	<b>Mean snow on ground</b>	<b>Diff snow on ground</b>
Wpg: Wildwood GC, 2006	Jan 15	F: 34.6	N/A	N/A	N/A	N/A	N/A
Wpg: Harris Blvd, 2006	Jan 23	A: 53.5	57.1	-3.6	N/A	19	N/A
Wpg: Bois des Esprits, 2006	< Feb 21	A: 53.5	57.1	-3.6	N/A	19	N/A
Wpg: Assiniboine P, 1987	Feb 18	A: 60.1	57.1	3	32	19	13
Wpg: King's P, 1984	Feb 26	A: 29.8	57.1	-27.3	2	19	-17
near Hartney, 1925	Feb 28	V: N/A	61.3	N/A	N/A	N/A	N/A
Birds Hill PP, 1981	Feb 28	S: 15.6	56.4	-40.8	N/A	N/A	N/A
Wpg: Fort Whyte, 1982	Feb 28	A: 52.5	57.1	-4.6	5	19	-14
Wpg: Fort Garry, 1983	Feb 28	A: 42.0	57.1	-15.1	6	19	-13
Wpg: Assiniboine P, 1960	Mar 1	A: 32.5	57.1	-24.6	8	19	-11
Woodworth, 1978	Mar 4	O: 36.3	68.8	-32.5	N/A	N/A	N/A
Teulon, 1927	Mar 7	Fr: N/A	65.2	N/A	N/A	N/A	N/A
Reston, 1981	Mar 7	V: 44.7	61.3	-16.6	0	25	-25

Total winter snow is the sum of the recorded snowfall for December, January, and February at the nearest Environment Canada weather station for the relevant winter. Mean winter snow is the long-term average snowfall for the same period since recording began. Diff snowfall is the difference between total winter snowfall for the given year and the long-term mean. Snow on ground is measured on the last day of February for the given year. Mean snow on ground is the long-term mean of snow on the ground on the last day of February. Diff snow on ground is the difference between the snow on ground for the given year and the long-term mean.<sup>3</sup>



The exceptionally early nests documented here provide anecdotal evidence for two hypotheses: 1) that temperature is one of the cues used by Great Horned Owls in timing their breeding effort, possibly overriding photoperiod under certain conditions, and 2) that Great Horned Owls and other owls in suburban environments may benefit from the urban heat island in terms of early nesting. There is some evidence for the former from the Barn Owl,<sup>1,8</sup> and for the latter from the Eastern Screech-Owl.<sup>4</sup>

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"When the ground is completely bare of snow and a few warm days have dried its surface— It is pleasant to compare the faint tender signs of the infant year just peeping forth with the stately beauty of the withered vegetation which has withstood the winter— the various thistles which have not yet sown their seeds— The graceful reeds and rushes, whose winter is more gay and stately than their summer—as if not till then was their beauty ripe."  
Henry D. Thoreau, *Journal, Volume 1: 1837-1844*.p. 471.