

Southern Ontario Bald Eagle Monitoring Program

2009 Summary Report



Photo: M. Bacro/BSC 2009

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BACKGROUND

Prior to European settlement, the Great Lakes supported a healthy population of Bald Eagles (*Haliaeetus leucocephalus*). An estimated 200 pairs nested from the Ottawa River to the lower Great Lakes, and the density of Bald Eagle nests (active and inactive) may have reached as high as one per mile of shoreline along Lake Erie (Weekes 1974). However, loss of nesting and foraging habitat through the clearing of land for agriculture, along with direct human persecution, led to a rapid decline in the Great Lakes population in the early 1900s (reviewed in Austen *et al.* 1994). The introduction of protective legislation, including the Ontario Ministry of Natural Resources' Game and Fish Act in 1890, and the American Bald Eagle Act in 1940 helped the southern Ontario population rebound to approximately 100 pairs by 1950 (Weekes 1974). Unfortunately, this recovery was short-lived, due to the introduction of synthetic chlorinated compounds such as DDT and PCBs into the Great Lakes aquatic food chain. Bioaccumulation of DDT (and its breakdown product DDE) in the bodies of adults led to reproductive failure through eggshell thinning and embryo death (Donaldson *et al.* 1999).

The Bald Eagle population in the Great Lakes basin declined almost to the point of extirpation in the 1960s (reviewed in Donaldson *et al.* 1999). Although Canada and the US severely restricted the use of DDT in the 1970s, the effects lingered on for many more years. Bald Eagles in the Great Lakes were slow to recover, possibly due to continued exposure to PCBs (Donaldson *et al.* 1999). In 1980, the Great Lakes population experienced almost complete reproductive failure. There were only three active nests along the north shore of Lake Erie in that year, and all failed to produce young (OMNR historical data).

In 1973, the Bald Eagle was declared a provincially Endangered Species. In 2006, the Ontario Ministry of Natural Resources reviewed the status of Bald Eagles, which resulted in a split designation. In northern Ontario (north of the French River), the species was classified as Special Concern, but the Endangered designation was retained for southern Ontario. As of August 2009 the status of the Bald Eagle in southern Ontario was again reviewed and reclassified as Special Concern.

In 1983, the Southern Ontario Bald Eagle Monitoring Project, a cooperative project led by the OMNR and the Canadian Wildlife Service (CWS) was initiated. Population monitoring was led by OMNR and the hacking of young eaglets was led by CWS. Bird Studies Canada (BSC) became a partner in the Bald Eagle monitoring project in 1996, when it assumed responsibility for the coordination of field studies and monitoring efforts. This project relies heavily on the cooperation of landowners and volunteer nest monitors to obtain information on Bald Eagle nesting activity and productivity. The study area includes the Canadian sides of the Lake Erie and Lake Ontario drainage basin, and also incorporates the Upper St. Lawrence River and the Canadian shore of Lake Huron excluding Georgian Bay and Manitoulin Island.

From 1973-1982, OMNR (with assistance from the public) monitored territories, productivity (number of young fledged per active nest), and mortality. Beginning in 1983, productivity was monitored annually from the nest, and eaglets within the study area were weighed, measured, and banded. Nest site characteristics, such as tree species and height of nest were also recorded. To further aid recovery efforts, from 1983-1987, 32 eaglets were transplanted from northwestern Ontario and released at two hacking sites on the north shore of Lake Erie. From 1988-1999, blood and feather samples were taken annually from eaglets to monitor levels of pesticides and heavy metal contaminants. Analysis of data collected from these field studies showed that, by the early 1990s, the health of the Bald Eagle population had improved and levels of contaminants had declined dramatically. At the same time, the number of nests and the mean number of chicks produced at each nest had also increased.

Starting in 2000, a low-intensity monitoring protocol based on annual ground and aerial observations of nesting eagles was implemented. Annual blood samples were no longer deemed necessary, since there was fairly strong evidence for a decline in contaminants in Great Lakes eagles (Donaldson *et al.* 1999), and all examined eaglets hatched over the last decade have appeared to be healthy (P. Hunter pers. Comm.).

In 2004, a satellite-tracking program (Destination Eagle) was initiated with the goal of tracking the movements of juvenile eagles in their first three years of life. From 2004-2009, a total of 24 eaglets have been tracked.

The objectives of the 2009 project were to:

1. Continue to locate and monitor all territories (new and historic) in southern Ontario through a network of volunteer nest monitors and landowners, in order to continue to provide accurate information on eagle population size and productivity;
2. Use satellite telemetry to track movements of five young eaglets for approximately 3 to 5 years, in order to determine wintering areas, stopover sites, timing, and dispersal patterns;
3. Sample feathers of eagles fitted with transmitters, and their siblings, for heavy metal contaminant analyses;
4. Colour band eaglets from 4 nests to help provide information on dispersal and longevity.

2009 NESTING SEASON SUMMARY

Nine new territories were established in 2009 (BT1, BR8, EX11, FR3, HA1, LP9, LP10, LG4 and YK1). A territory was defined by the presence of two potentially breeding birds within suitable nesting habitat during the breeding season where some sign of pair bonding or nesting is evident (e.g. nest building, copulation, etc.). Nests were constructed at BT1, BR8, EX11, FR3, HA1, LP9, LP10, LG4, YK1; and a territorial pair was present at PR3 but there was no confirmation of nesting.

In total, 78 Bald Eagle territories within the study area have been occupied at least once since monitoring began in 1980 (Appendix A). There were also non-occupied platforms (e.g. P11 and PP1), which despite reports of eagle activity in the area, remained inactive. At other territories containing platforms (e.g. EN2, EX1, EX5 and EX10), nesting activity has been observed but the platforms are currently inactive. The nest platform constructed at Point Pelee National Park (EX10) in December 2007 attracted a territorial pair within a month of construction, however the birds did not return to nest in subsequent years. Two pairs (BR8 and LG1) nested successfully in Osprey platforms in 2009.

Three territories which had inactive or unknown nests in 2008 had successful nests in 2009: KT1, LB1 and MX5 (formerly OX1). One active nest site in 2008 was known to have been abandoned in 2009 (BR6).

Productivity

In 2009 there was an increase in the number of occupied territories across southern Ontario (61 in 2009, 52 in 2008; Allair 2008b). In 2009, there were 48 known active Bald Eagle nests within the study area, of which 38 produced at least one young (Table 1, Table 2, and Figure 1). We were able to establish monitors for most nests in 2009, thereby decreasing the number of nests with unknown outcome down to 5 (compared to 10 in 2008). At least 66 young were produced overall, with a mean productivity of 1.53 fledglings per active nest of known outcome (Table 2, Figure 2). The mean productivity decreased slightly from 2008 with 1.74 young fledged per active nest (Allair 2008b).

In 2009, 47% (18) of successful nests produced two young, which was significantly lower than in 2008 when 79% of nests produced two young. Five pairs (13%) produced triplets in 2009, and at least one pair (HN5) had three young in the nest early in the season, but only two fledged successfully. Fifteen pairs (39.5%) fledged a single young in 2009, up from 9 pairs (26%) in 2008.

Nest failures

There were five failed nests reported in 2009 (BR1, EX1, PI3, HN3, LP4). The majority of the fatalities were contributed to chicks falling from nests and nest falling out of trees. There were 5 other locations (WE1, EN2, EN4, KT3 and NA1) with active nests for which productivity was unknown.

2009 BANDING AND SATELLITE TELEMETRY

In 2009, four Bald Eagle nests were accessed and 8 nestlings were banded; no blood samples were collected. Feather samples were collected from all nestlings for mercury testing, and adult feathers were also collected at nest sites for heavy metal analyses. Locations of banded nestlings were: Elgin County (EN5 – 3 nestlings), Norfolk County (HN5 – 2 nestlings) and Leeds and Grenville County (LG1 – 2 nestlings, LG3 – 1 nestling). Two additional eaglets were banded and subsequently released from rehabilitation centers in southwestern Ontario during the summer.

The five eaglets fitted with satellite transmitters were distributed across all accessed nest sites (1 at EN5, 2 at HN5, 1 at LG1, and 1 at LG3). There are currently nine Bald Eagles that are actively transmitting; Spirit and Phyllis from LG1 banded 15 June 2006, Canuck and Fleming from EN5 banded 12 June 2008, Thor and Delhi from HN5 banded 2 June 2009, Neetu from EN5 banded 12 June 2009, Moose from LG1 banded 16 June 2009 and Hal from LG3 banded 16 June 2009. No injuries were sustained to any eagles during any part of the handling in 2009. For more information on the satellite tracking program (*Destination Eagle*) and to follow the movements of these and other eaglets, please visit our website: <http://www.bsc-eoc.org/research/speciesatrisk/baea>.

TABLE 1- Summary of Bald Eagle nesting activity and productivity at each occupied territory in Southern Ontario in 2009. Territories were classified as occupied (O), abandoned (AB), empty (E), or unknown (U). Nests were classified as active (A, eggs laid), occupied (O, territory occupied but no eggs laid), or inactive (I, territory inactive). Productivity was defined as the number of young raised to fledging, — indicates not applicable because territory and/or nest were inactive, U - indicates Unknown Status. Nesting territories which were defined as abandoned for more than 5 years have been removed from the list.

Territory ID	Location	Territory Status	Nest Status	Productivity	Comments
BRANT					
BT1	Grand River	O	O	—	New nest and territory in 2009.
BRUCE					
BR1	Lake Huron	O	A	0	Nest failed.
BR2	Lake Huron	E	I	—	
BR3	Georgian Bay	E	I	—	
BR4	Lake Huron	E	I	—	
BR6	Lake Huron	O	I	—	Nest fell in 2009.
BR7	Bruce	O	A	3	
BR8	Bruce	O	A	1	Nest on Osprey platform. New nest and territory in 2009.
WELLINGTON					
WE1	Luther Marsh	O	A	U	
ELGIN					
EN2	Lake Erie	O	A	U	
EN3	Lake Erie	O	A	2	
EN4	Lake Erie	O	A	U	
EN5	Lake Erie	O	A	3	Nest accessed, chicks banded.
EN6	Thames River	O	A	1+	New nest location in 2009.
EN7	Catfish Creek	O	A	3	
EN8	Kettle Creek	O	A	1	
EN9	Big Otter Creek	O	U	U	
EN10	Thames River	O	U	U	
ESSEX					
EX1	Lake Erie	O	A	0	Nest failed, 2 chicks died.
EX2	Lake Erie	O	A	2	New nest in 2009.
EX3	Lake Erie	O	A	1+	
EX4	Detroit River	E	I	—	
EX5	Detroit River	O	A	2	
EX6	Detroit River	O	A	2	
EX7	Detroit River	O	A	2	1 chick died after fledging.
EX10	Lake Erie	O	U	U	
EX11	Lake St. Clair	O	O	—	New nest and territory in 2009.

Territory ID	Location	Territory Status	Nest Status	Productivity	Comments
PI2	Lake Erie	O	A	2	
PI3	Lake Erie	O	A	0	No active young seen in 2009.
FRONTENAC					
FR1	Bob's Lake	O	A	2	
FR2	Wolfe Lake	O	A	2	
FR3	Kashwakamak Lake	O	A	2	New nest and territory in 2009.
GREY					
GY1	Lake Huron	O	A	1	
HAMILTON					
HA1	Lake Ontario	O	O	—	New nest and territory in 2009.
HURON					
HU1	Auburn	O	A	1+	
HALDIMAND-NORFOLK					
HN2	Lake Erie	O	A	2	
HN3	Lake Erie	O	A	0	Nest failed.
HN4	Grand River	O	A	1	Mate change at nest (possible 3 rd year bird)
HN5	Lake Erie	O	A	2	Originally triplets, 1 dead chick found at base of nest. Nest accessed, chicks banded.
HN6	Lake Erie	O	U	U	
HN7	Grand River	O	A	1	
HN8	Grand River	O	A	2	
LP4	Lake Erie	O	A	0	Nest failed
LP7	Lake Erie	E	I	—	
LP8	Lake Erie	O	A	3	
LP9	Lake Erie	O	A	1	New nest and territory in 2009.
LP10	Lake Erie	O	A	1	New nest and territory in 2009.
KENT					
KT1	Lake St. Clair	O	A	1+	
KT2	Lake Erie	O	U	U	Possible new nest location in 2009.
KT3	Thames River	O	A	U	
KT4	Lake Erie	U	U	U	
KT5	Lake Erie	U	U	U	
RP2	Lake Erie	O	A	2	

Territory ID	Location	Territory Status	Nest Status	Productivity	Comments
LAMBTON					
LB1	Lake Huron	O	A	2	New nest location in 2009.
LEEDS-GRENVILLE					
LG1	Lake Ontario	O	A	3	New nest location at Osprey nesting platform. Nest accessed and chicks banded.
LG3	Lake Ontario	O	A	1	Nest accessed and chick banded.
LG4	Upper Beverly Lake	O	A	2	New nest and territory in 2009.
MIDDLESEX					
MX1	Thames River	O	A	2	
MX2	Thames River	O	A	2	
MX3	Thames River	O	A	1+	
MX4	Thames River	U	U	U	
MX 5	Thames River	O	A	1	Formerly OX1 pair.
NIAGARA					
NA1	Niagara River	O	A	U	
NORTHUMBERLAND					
NH1	Trent River	O	A	2	
PETERBOROUGH					
PR1	Kawartha Lakes	O	A	1	
PR2	Kawartha Lakes	O	U	U	
PR3	Rice Lake	O	U	U	Appears to be a pair breeding in the region, no confirmed nest found.
SIMCOE					
SI1	Minesing Wetland	O	U	U	
YORK					
YK1	Lake Simcoe	O	O	—	New nest and territory in 2009.

Table 2 - Summary of Bald Eagle nesting activity in Southern Ontario in 2009 and 2008.

Reproductive parameter	2009	2008
Number of occupied territories	61	52
Number of active nests	48	45
Number of successful nests	38	35
Number of failed nests	5	0
Nests that fledged 1 young	15	9
Nests that fledged 2 young	18	26
Nests that fledged 3 young	5	0
Total number of young produced	66	61
Nests with unknown productivity	5	10
Young/occupied territory	1.1	1.17
Young/successful nest	1.74	1.74
Productivity (young/active nest of known outcome)	1.53	1.74

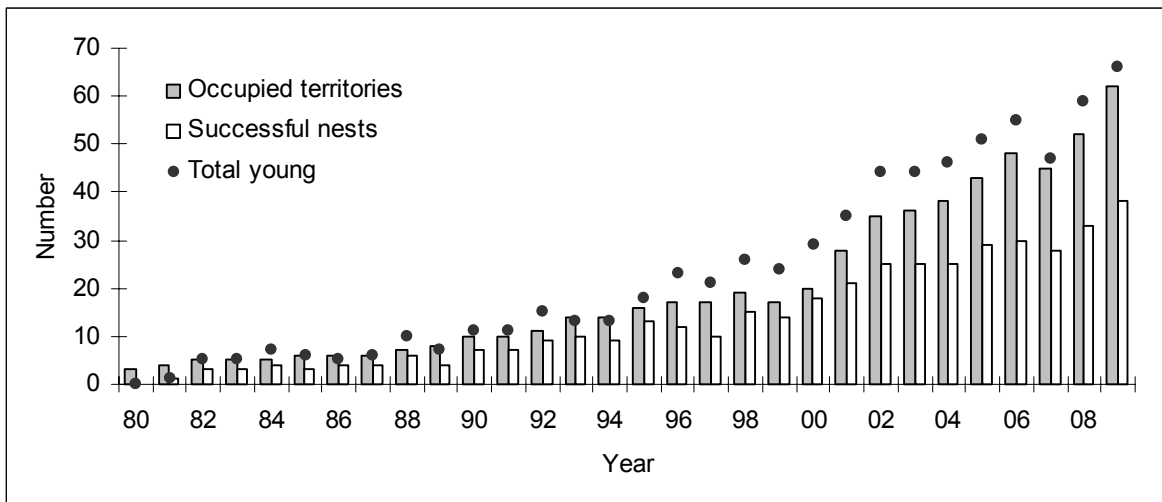


Figure 1 - The number of successful Bald Eagle nests and occupied territories in southern Ontario (bars), and the total number of eaglets produced (dots) from 1980-2009. A nest was classified as successful if one or more young survived to fledging.

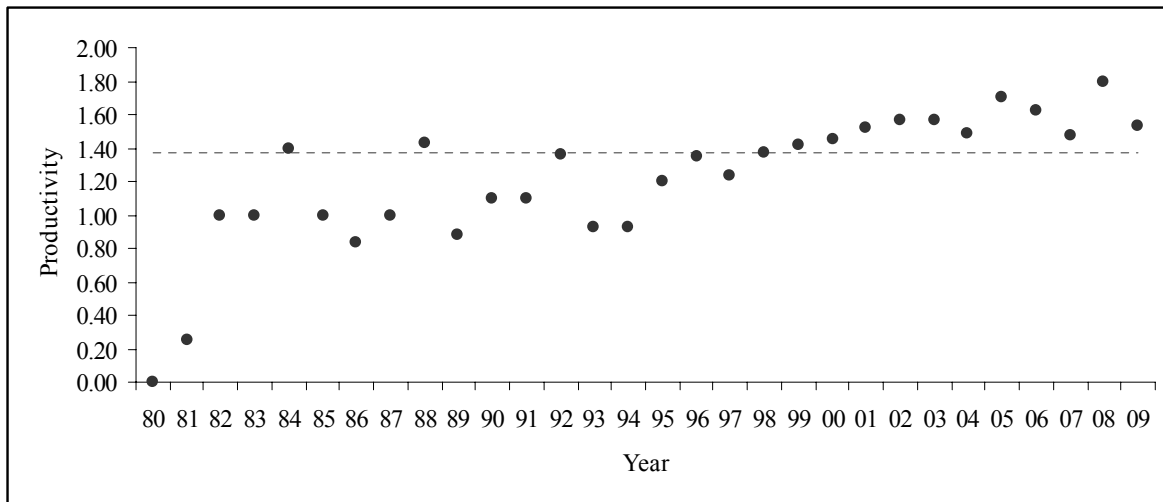


Figure 2 - Productivity (mean number of chicks fledged per active nest) of Bald Eagles in Southern Ontario between 1980 and 2009. The dotted line represents the average productivity over the last 28 years (1.37).

SUMMARY

There has been a steady increase in Bald Eagle population size and productivity over the last 30 years. Since the program began in the 1980s, the population has increased from only a few nesting pairs, to 38 successfully nesting pairs (highest since 1980) and a productivity level of 1.53 in 2009 (1980-2009 average = 1.37). Some of the highlights of the 2009 field season included:

- Nine new territorial pairs confirmed.
- A better understanding of the number and the distribution of territories and active nests within Elgin County and Norfolk County.
- A reduction in the number of active nests with unknown productivity (down to five in 2009 compared to 11 in 2008).
- A total of 10 eaglets were banded and feather sampled in 2009, the most since 2005.
- Nine eaglets were tracked via satellite into November 2009, including Spirit and Phyllis who were tagged in 2006.
- Funding through the Ontario Trillium Foundation, Ministry of Natural Resources Species at Risk Stewardship Fund and Ontario Power Generation allowed BSC to deliver a very successful Bald Eagle educational program *Eagles in the Classroom* (60 classes and over 1,400 students) in London, Peterborough and Haldimand and Norfolk Counties. Educational work also included a lecture at Sir Sandford Fleming College in Lindsay.

Plans for 2010 include scaling back *Destination Eagle* – the satellite telemetry component of the monitoring program. The existing data are currently being analyzed, and the focus of Bird Studies Canada is to now find resources to help cover the costs of the satellite time. In addition, we will not access any nests or band any nestlings in 2010. Annual blood sampling is no longer necessary as contaminant levels are now at very low levels. The exception will be any birds that are recovering from trauma in rehabilitation centres in southern Ontario. These birds will be banded and blood sampled (depending on the health of the bird). Bird Studies Canada will also continue to facilitate the transfer of dead eagles to the CCWHC for necropsy and eventually to Environment Canada for contaminant analyses.

Nest monitoring efforts will continue as in previous years. Special emphasis will be placed on increasing stewardship and clarifying the number and locations of nesting Bald Eagles in regions where we have no dedicated nest monitors.

ACKNOWLEDGEMENTS

The Southern Ontario Bald Eagle Monitoring Program could not be conducted without the help of many dedicated individuals. A big thank you goes out to the landowners and nest monitors who have grown too numerous to mention individually. Each has shown strong commitment and dedication to Bald Eagles in Ontario, and they collectively continue to make the monitoring program a success.

Sincere thank you to: Leone Passmore (EN5 landowner and monitor), Anne Lasanowski (HN5 landowner and monitor) and Bud Address (LG1 and LG3 monitor) for making significant contributions to this year's project. Special thanks also to James and Shauna Cowan of the Canadian Raptor Conservancy, Ellen Kempmann (BSC), Phil Roberts (Essex County Field Naturalists), Stu Mackenzie, Yousif Attia, Ross Wood, Hazel Wheeler, Elisabeth Van Stam, Jon McCracken (BSC), Danny Bernard (CWS) Pud Hunter, Ron Gould, Allen Woodliffe, Art Timmerman (OMNR), Brian Salt, Ulrich Waterman, Neil McCarney, Chris McCarney and the St. Lawrence Bald Eagle Working Group. Mark Bacro (BSC) once again braved the elements and enthusiastically climbed the nest trees. Thanks also to Andrew Couturier (BSC) for designing Eagle Tracker and for his ongoing support of the web program, to Denis Lepage (BSC) for designing the parsing program for telemetry data, and to Debbie Badzinski for project advice, invaluable field assistance and for reviewing an earlier version of this report.

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Southern Ontario Bald Eagle Monitoring Program - Management Team (November 2009)

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Appendix A — Productivity of Southern Ontario Bald Eagle nests; 1980-2009 (mean = total/#years nest occupied). AB = abandoned, U = unknown

ID	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	Total	Mean	
BR1																							2	1	2	2	2	0	2	0	11	1.38	
BR2																									0						0	0.00	
BR3																							U										
BR4																							1	1							2	1.00	
BR6																										2	2	2	2		8	2.00	
BR7																													U	3	3	3.00	
BR8																														1	1	1.00	
WE1																												1	U	U	1	1.00	
EN1 ^{AB}		0	0	1																											1	0.33	
EN2	0				0	0	0	1	1	0	0	1	0	0	0	1	1	1	0	2	2	2	2	1	1	0	2	U	U	U	U	16	0.70
EN3						0	0	1	1	2	2	3	1	0	3	1	3	3	3	3	2	2	2	0	3	1	2	2	2	2	2	44	1.76
EN4																	0	0	1	0	1	1	3	2	2	2	U	U	1	U	13	1.18	
EN5																		1	2	2	1	3	0	2	0	1	2	U	2	3	19	1.58	
EN6																					0	0	1	0	2	2	2	1	2	1	11	1.10	
EN7																						2	3	3	2	2	3	U	2	3	20	2.50	
EN8																												U	2	1	3	1.50	
EN9																												U		U			
EN10																													U	U			
EX1	0	0	0	0	2	2	1	0	0	0	1	2	3	1	1	0	2	2	1	2	0	2	2	2	1	1	1	2	1	0	32	1.07	
EX2		1	2	2	1	2	2	3	2	1	2	1	2	1	1	2	3	0	2	0	2	2	2	-	2	2	2	2	2	2	48	1.71	
EX3										0	2	1	2	1	1	1	3	3	2	2	2	2	2	2	U	1	0	1	1	1	30	1.50	
EX4													0	0	1	1	2	3	1	1	2	2	2	2	1		2	1		21	1.40		
EX5																							U	2	1			1	2	2	8	1.60	
EX6																									2	2	2	1	U	2	9	1.80	
EX7																										2	2	1	2	2	9	1.80	
EX10																												0	U	U	0	0.00	
PI2																			1	1	3	2	2	1	2	1	2	2	1	2	20	1.67	
PI3																														1	0	1	0.50
FR1																					2	2	3	3	2		2	2	1	2	19	2.11	
FR2																						1	1	1	2		2	2	1	2	12	1.50	
FR3																														2	2	2.00	
GY1													1	2	1	2	2	0	0		0	1	U	1				1	2	1	14	1.08	
HU1																													2	1	3	1.50	
HN1 ^{AB}											0	0	0																		0	0.00	
HN2											0	0	2	2	2	2	1	0	3					2	2	3	3	2	2	2	30	1.76	

Appendix A — Productivity of Southern Ontario Bald Eagle nests; 1980-2009 (mean = total/#years nest occupied). AB = abandoned, U = unknown

ID	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	Total	Mean	
HN3														1	2	2	2	2	3	2	2	2	0	0	2	2	2	0	2	0	26	1.53	
HN4															0	1	1	2	2	2	2	2	2	2	2	3	2	3	2	1	29	1.81	
HN5																					2	1	0						2	2	7	1.40	
HN6																													U	U			
HN7																													U	1	1	1.00	
HN8																													2	2	4	2.00	
LB1																							2	3	3	2	1	2		2	15	2.14	
LP1			2	0	1	0	1	0	2	2	1	0	1	1	0	1	0	0	1		2	1	1	1	1	2				21	0.91		
LP2									2	0	2	1	2	2	1	0	0	0	2	2	1	1	1	3							20	1.25	
LP3														1		2	0	1	0	1	1		1	1	3						11	1.10	
LP4																							0	1	U			2	2	0	5	1.00	
LP5																							1					U			1	1.00	
LP6																									1	3		U			4	2.00	
LP7																											2	0			2	1.00	
LP8																											1	U	2	3	6	2.00	
LP9																														1	1	1.00	
LP10																														1	1	1.00	
KT1															0	1	1	3	1	1	1	1	1	2	1	1	1	1	1	17	1.13		
KT2																							2	2	3			U	U	U	7	2.33	
KT3																									0			U	1	U	1	0.50	
KT4																											1	U	1	U	2	1.00	
KT5																											U	U	U	U			
RP1 ^{AB}	0	0	1	2	3	2	1	1	2	2	1	0		0	0	1	0													16	1.00		
RP2											2	1	1	0					1		1	2	2	2		1	2	2	2	2	21	1.50	
LG1																				1	0	1	2	1	2	3	2	3	2	3	20	1.82	
LG2																								0								0	0.00
LG3																												2	2	1	5	1.67	
LG4																														2	2	2.00	
MX1																											1	1	U	2	2	6	1.50
MX2																											1	2	2	2	2	9	1.80
MX3																												U	2	1	3	1.50	
MX4																													U	U			
MX5/OX1																												1		1	2	1.00	

Appendix A — Productivity of Southern Ontario Bald Eagle nests; 1980-2009 (mean = total/#years nest occupied). AB = abandoned, U = unknown

ID	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	Total	Mean
NA1																									2	3		1	U	6	2.00	
NH1																2	0	0	0	1				1	1	2	1	1	U	2	11	1.00
PR1																										1	2	2	2	1	8	1.60
PR2																									U	1	2	2		U	5	1.67
PR3																												U		U		
SI1																													U	U		
Total	0	1	5	5	7	6	5	6	10	7	11	11	15	13	13	18	23	21	26	24	29	35	44	44	46	52	55	47	61	66	706	1.37