

Southern Ontario Bald Eagle Monitoring Program

2011 Summary Report



Photo: Mark Bacro

March 2012

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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 project (Destination Eagle) was initiated with the goal of tracking the movements of juvenile eagles in their first three years of life. From 2004 until the completion of the project in 2009, a total of 24 eaglets were tracked.

The objectives of the 2011 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. Continue to track movements of young eaglets with active satellite transmitters to determine wintering areas, stopover sites, timing, and dispersal patterns;
3. Collect discarded feather samples of nesting eagles for heavy metal contaminant analyses;
4. Work with the Ontario Ministry of Natural Resources and the Canadian Cooperative Wildlife Health Centre (CCWHC) to provide advice on development and disturbance issues and to help facilitate transfer of injured eagles to rehabilitation centres and deceased birds to the CCWHC facility at the University of Guelph for necropsy.

2011 NESTING SEASON SUMMARY

Eight new territories were established in 2011 (EN11, HU2, HU3, HN10, HN11, KT7, NA2 and PR4). 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 EN5, EN8, EN11, HU2, HN3, HN10, HN11, HU3 and MX4, and territorial birds were present at BR1, EN10, EX1, EX7, FR2, HN5, LP9, LP10, PR2, PR3 and WA1, but there was no confirmation of nesting.

In total, 89 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, EX10, HA1, LG3, LG4), 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 2011. The Bald Eagle pair at EN3 continued their use of an eagle nesting platform in 2011.

One territory, EX11 whose status was unknown in 2010 had an active nest in 2011. Three sites that were active in 2010 were not occupied or unknown in 2011 (EX2, EX13, LA1).

Productivity

In 2011 there was another increase in the number of occupied territories across southern Ontario (72 in 2011, 65 in 2010; Allair 2011). In 2011, there were 57 known active Bald Eagle nests within the study area, of which 41 produced at least one young (Table 1, Table 2, and Figure. 1). We weren't able to establish monitors for some nests in 2011, thereby increasing the number of nests with unknown outcome up to 19 (compared to 18 in 2010). At least 69 young were produced overall, with a mean productivity of 1.44 fledglings per active nest of

known outcome (Table 2, Figure 2). For the first time since 2008 the mean productivity increased with 1.44 young fledged per active nest compared to 1.36 in 2010 (Allair 2011).

In 2011, 54% (22) of successful nests produced two young, which was an increase from 47% (17) of nests in 2010. Three pairs (7%) produced triplets in 2011. Fifteen pairs (37%) fledged a single young in 2011, down from 17 pairs (47%) in 2010.

Nest failures

There were seven failed nests reported in 2011 (BT1, EN4, EN6, EX12, HA1, HN9 and LP4). The majority of the fatalities were contributed to chicks falling from nests and nests falling out of trees. Heavy winds associated with thunderstorms were the presumed culprit for the Elgin and Essex County nest failures in 2011. There were 8 other locations (EX3, EX5, EX11, HN4, HN6, HN10, KT6, and SI1) with active nests for which productivity was unknown.

Lake Ontario Watershed

An effort was made during the 2011 field season to try and confirm nesting birds at scattered locations throughout eastern Ontario, including Peterborough County, Northumberland County, Frontenac County, Lanark County and Leeds-Grenville County. In total, one new territory was reported in the Peterborough region (PR4). An unconfirmed report of a new Bald Eagle pair on the St. Lawrence River in Dundas, Stormont and Glengary County will need to be investigated in 2012.

In addition to working with our network of volunteer monitors in eastern Ontario, BSC continues to play an active role with the The Raptor Working Group of Eastern Lake Ontario and the Upper St. Lawrence River (formerly known as the St. Lawrence Bald Eagle Working Group).

2011 BANDING AND SATELLITE TELEMTRY

In 2011 no Bald Eagle nests were accessed and no eagles were banded.

As of December 2011 there were six Bald Eagles actively transmitting; Marsh from EX7 banded June 11, 2007, Canuck from EN5 banded 12 June 2008, Thor and Delhi from HN5 banded 2 June 2009, Neetu from EN5 banded 12 June 2009 and Hal from LG3 banded 16 June 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 2011. 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) 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	A	0	Nest failed
BRUCE					
BR1	Lake Huron	O	O	—	
BR6	Lake Huron	O	A	1	
BR7	Bruce	O	A	2	
BR8	Bruce	O	A	2	
WELLINGTON					
WE1	Luther Marsh	O	A	2	
ELGIN					
EN2	Lake Erie	O	A	1	
EN3	Lake Erie	O	A	1+	
EN4	Lake Erie	O	A	0	Nest failed
EN5	Lake Erie	O	A	1	New nest location in 2011
EN6	Thames River	O	A	0	Nest failed
EN7	Catfish Creek	O	A	2	
EN8	Kettle Creek	O	A	2	New nest location in 2011
EN9	Big Otter Creek	O	A	2	
EN10	Thames River	O	U	U	
EN11	Lake Erie	O	A	1	New nest and territory in 2011
ESSEX					
EX1	Lake Erie	O	U	U	
EX2	Lake Erie	U	U	U	
EX3	Lake Erie	O	A	U	
EX4	Detroit River	E	I	—	
EX5	Detroit River	O	A	U	
EX6	Detroit River	O	A	3	
EX7	Detroit River	O	U	U	
EX10	Lake Erie	E	I	—	
EX11	Lake St. Clair	O	A	U	
EX12	Lake Erie	O	A	O	Nest failed
EX13	Lake Erie	E	I	—	

Territory ID	Location	Territory Status	Nest Status	Productivity	Comments
PI2	Lake Erie	O	A	1	
PI3	Lake Erie	O	A	1	
FRONTENAC					
FR1	Bob's Lake	O	A	2	
FR2	Wolfe Lake	O	O	—	
FR3	Kashwakamak Lake	E	I	—	
GREY					
GY1	Lake Huron	O	A	3	
HAMILTON					
HA1	Lake Ontario	O	A	0	Nest failed
HURON					
HU1	Maitland River	O	A	2	Nest damaged in August
HU2	Maitland River	O	A	2	New territory and nest site in 2011
HU3	Bayfield River	O	A	2	New territory and nest site in 2011
HALDIMAND-NORFOLK					
HN2	Lake Erie	O	A	1+	
HN3	Lake Erie	O	A	2	New nest location in 2011
HN4	Grand River	O	A	U	
HN5	Lake Erie	O	U	U	Pair observed throughout season. New nest location unknown.
HN6	Lake Erie	O	A	U	
HN7	Grand River	O	A	2	
HN8	Grand River	E	I	—	
HN9	Big Creek	O	A	0	Nest failed
HN10	Grand River	O	A	U	New territory and nest site in 2011
HN11	Lake Erie	O	A	1	New territory and nest site in 2011
LP4	Lake Erie	O	A	0	Nest failed
LP7	Lake Erie	E	I	—	
LP8	Lake Erie	O	A	1+	
LP9	Lake Erie	O	U	U	
LP10	Lake Erie	O	U	U	
KENT					
KT1	Lake St. Clair	O	A	1+	
KT2	Lake Erie	O	A	2	
KT3	Thames River	O	A	1	
KT4	Lake Erie	O	A	1+	
KT5	Lake Erie	O	A	2	
KT6	Lake St. Clair	O	A	U	
KT7	Thames River	O	—	—	New territory in 2011
RP2	Lake Erie	O	A	2	

Territory ID	Location	Territory Status	Nest Status	Productivity	Comments
LAMBTON					
LB1	Lake Huron	O	A	3	
LANARK					
LA1	Christie Lake	U	U	U	
LEEDS-GRENVILLE					
LG1	Lake Ontario	O	A	2	
LG3	Lake Ontario	O	A	2	
LG4	Upper Beverly Lake	O	A	2	
MIDDLESEX					
MX1	Thames River	O	A	1	
MX2	Thames River	O	A	2	
MX3	Thames River	O	A	2	New nest site in 2011
MX4	Thames River	E	I	—	
MX 5	Thames River	E	I	—	
NIAGARA					
NA1	Niagara River	O	A	U	
NA2	Lake Erie	O	—	—	New territory in 2011
NORTHUMBERLAND					
NH1	Trent River	O	A	1	
NH2	Trent River	O	A	2	Nest fell during nesting, chicks survived
PETERBOROUGH					
PR1	Kawartha Lakes	O	A	1	
PR2	Kawartha Lakes	O	U	U	
PR3	Rice Lake	O	U	U	
PR4	Stoney Lake	O	—	—	New territory in 2011
SIMCOE					
SI1	Minesing Wetland	O	A	U	
WATERLOO					
WA1	Grand River	O	O	—	
YORK					
YK1	Lake Simcoe	O	A	2	

Table 2 - Summary of Bald Eagle nesting activity in Southern Ontario in 2011 and 2010.

Reproductive parameter	2011	2010
Number of occupied territories	71	65
Number of active nests	57	51
Number of successful nests	41	36
Number of failed nests	7	6
Nests that fledged 1 young	15	17
Nests that fledged 2 young	22	17
Nests that fledged 3 young	3	2
Total number of young produced	69	57
Nests with unknown productivity	19	18
Young/occupied territory	.97	.88
Young/successful nest	1.68	1.58
Productivity (young/active nest of known outcome)	1.44	1.36

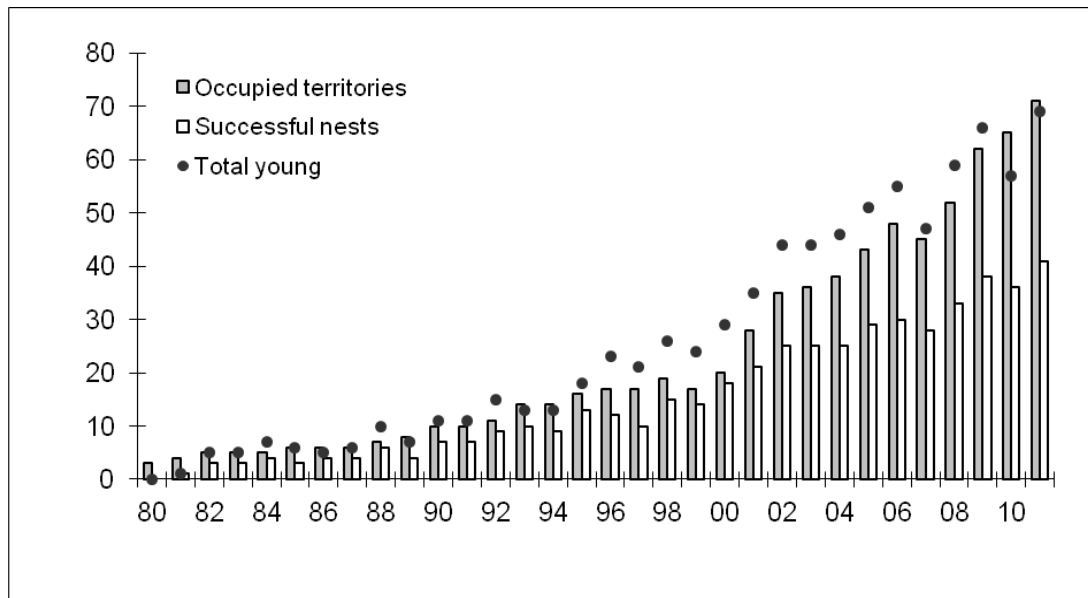


Figure 1 - The number of successful Bald Eagle nests and occupied territories in southern Ontario (bars), and the total number of eaglets produced (dots) from 1980-2011. A nest was classified as successful if one or more young survived to fledging.

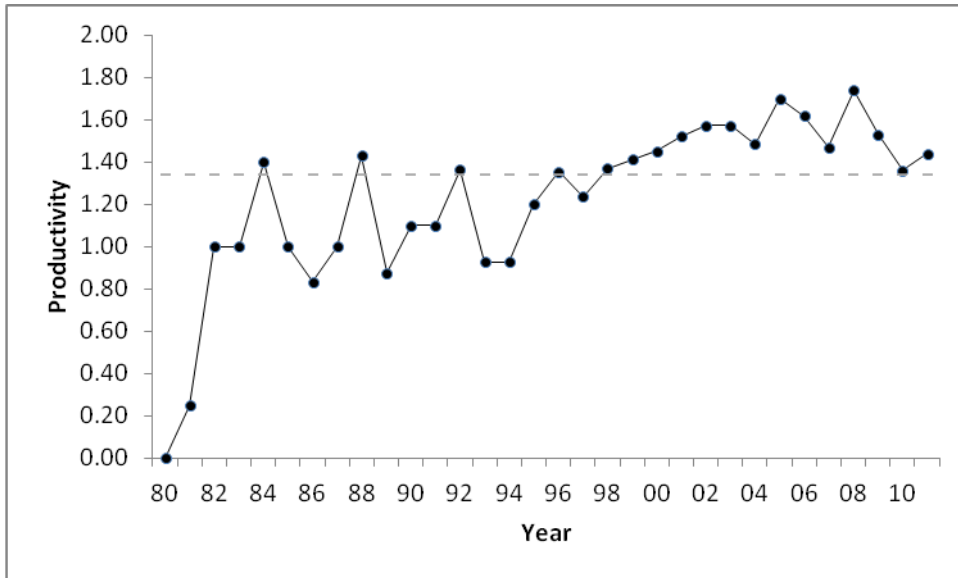


Figure 2 - Productivity (mean number of chicks fledged per active nest) of Bald Eagles in Southern Ontario between 1980 and 2011. The dotted line represents the average productivity over the last 32 years (1.34).

SUMMARY

There has been a steady increase in Bald Eagle population size and productivity over the last 32 years. Since the program began in the 1980s, the population has increased from only a few nesting pairs to 41 successfully nesting pairs, the highest number recorded in southern Ontario since the project began. The overall nest productivity increased in 2011 to 1.44, up from 1.36 in 2010 (1980-2011 average = 1.34). Some of the highlights of the 2011 field season included:

- 8 new territorial pairs confirmed;
- 71 occupied territories, the highest number since the program began in 1980;
- 41 successfully nesting pairs – record high;
- 69 successfully fledged young – record high;
- A better understanding of the number and the distribution of territories and active nests within Kent and Elgin Counties and in Eastern Ontario, particularly within the Lake Ontario watershed;
- Six eaglets were tracked via satellite into December 2011, including Marsh who was banded in 2007.

Plans for 2012 include analyzing our existing satellite telemetry data and focus on finding resources to help cover the costs of the satellite time. Similar to 2011, we will not access any nests or band any nestlings in 2012. 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: Bud Andress (LG1 and LG3 monitor), Brian Salt (Salthaven Wildlife Rehabilitation and Education Centre) and Mark Wiercinski (GY1) for making significant contributions to this year's project. Special thanks also to James and Shauna Cowan of the Canadian Raptor Conservancy, Bev Wannick (Essex Region Conservation Authority), Stu Mackenzie, Ross Wood, Elisabeth Van Stam, Jon McCracken (BSC), Mike Malhiot, Ben Hindmarsh, Pud Hunter, Ron Gould, Allen Woodliffe, Art Timmerman, Michael Nelson, Don Sutherland (OMNR) and Patrick Mooney. 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.

Thanks to the Government of Ontario for supporting this program.

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Appendix A — Productivity of Southern Ontario Bald Eagle nests; 1980-2011 (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	10	11	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			U	1	9	1.80			
BR7																													U	3	2	2	7	2.33				
BR8																														1	1	2	4	1.33				
BT1																															2	0	2	2.00				
WE1																												1	U	U	1	2	4	1.33				
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	1	1	0	2	U	U	U	U	U	U	1	17	0.71			
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	0	1	45	1.67				
EN4																	0	0	1	0	1	1	3	2	2	2	U	U	1	U	1	0	14	1.08				
EN5																		1	2	2	1	3	0	2	0	1	2	U	2	3	0	1	20	1.43				
EN6																					0	0	1	0	2	2	2	1	2	1	1	0	12	1.00				
EN7																							2	3	3	2	2	3	U	2	3	3	2	25	2.50			
EN8																												U	2	1	2	2	7	1.75				
EN9																												U		U	1	2	1	1.50				
EN10																													U	U	U	U						
EN11																																	1	1	1.00			
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	0	U	32	1.03				
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	U	U	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	0	U	30	1.43				
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	1	U	9	1.50				
EX6																										2	2	2	1	U	2	2	3	14	2.00			
EX7																											2	2	1	2	2		U	9	1.80			
EX10																													0	U	U			0	0.00			
EX11																																		U				
EX12																																	0	0	0.00			
EX13																																0		0	0.00			
PI2																			1	1	3	2	2	1	2	1	2	2	1	2	1	1	22	1.57				
PI3																														1	0	1	1	3	0.75			
FR1																										2	2	3	3	2		2	2	1	2	2	23	2.09
FR2																										1	1	1	2		2	2	1	2	2	14	1.56	

Appendix A — Productivity of Southern Ontario Bald Eagle nests; 1980-2011 (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	10	11	Total	Mean									
FR3																																2	2	2.00									
GY1													1	2	1	2	2	0	0		0	1	U	1				1	2	1	2	3	19	1.27									
HA1																																	0	0	0.00								
HU1																													2	1	1	2	6	1.50									
HU2																																	2	2	2.00								
HU3																																	2	2	2.00								
HN1											0	0	0																				0	0.00									
HN2										0	0	2	2	2	2	2	1	0	3					2	2	3	3	2	2	2	2	1	1	32	1.68								
HN3													1	2	2	2	2	3	2	2	2	0	0	2	2	2	2	0	2	0	2	2	30	1.58									
HN4														0	1	1	2	2	2	2	2	2	2	2	2	3	2	3	2	1	1	U	30	1.76									
HN5																					2	1	0										9	1.50									
HN6																													U	U	1	U	1	1.00									
HN7																													U	1	2	2	5	1.67									
HN8																													2	2			4	2.00									
HN9																																	0	0	0.00								
HN10																																	U										
HN11																																	1	1	1.00								
LA1																																2	U	2	2.00								
LB1																								2	3	3	2	1	2		2	2	3	22	2.22								
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	2	0	7	1.00								
LP5																								1										1	1.00								
LP6																										1	3		U					4	2.00								
LP7																												2	0					2	1.00								
LP8																												1	U	2	3	1	1	8	1.60								
LP9																																	1	U	U	1	1.00						
LP10																																	1	U	U	1	1.00						
KT1															0	1	1	3	1	1	1	1	1	2	1	1	1	1						19	1.12								
KT2																									2	2	3			U	U	U	U	2	9	2.25							
KT3																										0			U	1	U	1	1	3	0.75								
KT4																																		1	U	U	1	3	1.00				
KT5																																			U	U	U	U	U	U	2	2	2.00

Appendix A — Productivity of Southern Ontario Bald Eagle nests; 1980-2011 (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	10	11	Total	Mean		
KT6																																	U			
RP1AB	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	U	2		23	1.53		
LG1																				1	0	1	2	1	2	3	2	3	2	3	3	2		25	1.92	
LG2																								0										0	0.00	
LG3																												2	2	1	1	2		8	1.60	
LG4																														2	0	2		4	1.33	
MX1																										1	1	U	2	2	2	1		9	1.50	
MX2																										1	2	2	2	2	2	2	2		13	1.86
MX3																												U	2	1	1	2		6	1.50	
MX4																													U	U	U					
MX5/ OX1																											1			1				2	1.00	
NA1																										2	3		1	U		U		6	2.00	
NH1																	2	0	0	0	1			1	1	2	1	1	U	2	1	1	13	1.00		
NH2																															2	2		4	2.00	
PR1																										1	2	2	2	1		1		9	1.50	
PR2																									U	1	2	2		U	U	U		5	1.67	
PR3																												U		U	U	U				
SI1																													U	U	U	U				
YK1																															2	2		2	2.00	
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	57	69	832	1.34		