

Conservation Biology Research Grants Program
Division of Ecological Services
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STATUS OF THE EASTERN MERLIN (*Falco c. columbarius*) IN VOYAGEURS
NATIONAL PARK - 1990

For: Dr. Richard Baker
Minnesota Department of Natural Resources

Submitted by: Thomas C. J. Doolittle
Rt. 1, Box 271 A
Washburn , Wisconsin 54891

June 20, 1991

Abstract

In 1990, ten merlin adults were captured and 18 young were banded. Total known productivity (n=26 young) from 10 active nests was 2.6 young/active nest and 1.5/young occupied territory. Successful nest densities were 50% lower than in 1989, but the same as in 1988 (n=8). Productivity in 1990 was 3.3 young/successful nest, which was the exact mean in 1989. Two breeding adults were recaptured (1 male, 1 female) and three sites were known to turnover to new adults. All recaptured males have been caught at their previously occupied territory, the female captured was 2 km from her previous territory. Females have shown no site fidelity, and only a hint of regional fidelity. One band recovery was noted from a young from Mica Island located on Namakan Lake. The young of the year female was found dead in Baudette, Minnesota on 18 September 1990. The turnover rates of the Voyageurs study group are high, though re-occupancy of sites remain consistent. The reasons for the high turnover remain unknown. Nest sites with multiple nest structures and stable nest structures are usually reoccupied.

Introduction

In 1988 a research project was initiated to determine the status of the eastern taiga merlin (Falco c. columbarius) in the Upper Midwest. The objectives of the study are: 1) determine the population status and distribution of merlins in the Upper Midwest; 2) determine natural and/or artificial limiting factors affecting merlin productivity; and 3) define research and management needs, if any, to benefit the reproductive success of the species. In 1990, I censused breeding pairs, visited historic sites, noted food use, and monitored breeding success. Molted feathers, unhatched eggs and dead young were not collected, since no funding was available for analyses.

Methods

At Voyageurs National Park the initial survey for occupied nests and signs of breeding activity was conducted on Kabetogema and Namakan Lakes On May 5 and 6, 1990. Rainy Lake was surveyed on May 18 and 19, 1990. A second survey to determine active nests and to attempt the capture of adult males was conducted from 16 June through 23 June 1990. A final visit to determine site success, capture and band adults, and band young was done on 4 July through 7 July 1990 and 14 July through 17 July 1990.

The same capture procedures and raptor reproductive criteria and terminology used in 1988 and 1989 were used in 1990.

The only significant change in the vocalization technique was the use of a barred owl (Strix varia) call and raven (Corvus corax) calls during the second and third visit.

Results

Taped Vocalizations (playback recordings):

Most responses occurred within 100 meters of the nest. The early morning hours (not past 01000 hrs) and during calm weather conditions remain the best times to use playback recordings. Incubating females seldom respond to the play back recording. The female distress call seems to be the most effective at eliciting a response. Therefore, if females are incubating, the male must be present for a response to occur. It is preferable to use the play back recordings prior to incubation (15 April - 15 May) and after hatching (post July 1).

The use of raven and barred owl calls that the researcher vocalized proved invaluable to determine occupancy of a territory and to draw in an adult to visual range of the trapping owl. The calls were used during the second and final visits.

I strongly recommend either call during the early nestling period (June 19 - July 4) to illicit responses.

Productivity:

Twenty areas were considered occupied territories, 10 were active nests, of which eight were successful. The successful nests produced 26 young with a reproductive mean of 3.3 young/successful nest. The 1990 successful nest mean was identical to the 1989 mean, though there were 50% less successful nests.

Banding:

Ten breeding adults (6 males, 4 females) were captured and 18 young were banded at 10 active nests within the park (Table 1., 2. and 3.). There were two recaptures (1 male and 1 female). The male was at the same site as in 1989, while the female was with a new male approximately two kilometers from her 1989 nest. Three nests were known to turnover to new adults and three locations were new sites. The movement of males to another territory in successive years has not been observed. The turnover rate at active nests is at least 60%. The capture success rate was 60% for males and 40% for females. There was a decrease in trapping effort in 1990 due to time constraints.

One breeding female was in her second year. A young of the year female from Mica Island was found dead in Baudette, Minnesota on 18 September 1990. The cause of death was collision with an object.

Habitat:

Six of eight successful nests occupied in 1990 have been previously occupied. These sites have more than two suitable nests within the nest woods. Most merlins in 1990 used old crow nests (n=6), while two used old raven nests. All nests in the Upper Midwest have been in conifers. It becomes obvious that re-occupancy is directly related to areas that consistently provide available nests. Additionally, these nests must be located in sheltered areas and the structures must be stable to augment productivity. One interesting factor is the perimetric position of merlin nests on lake edges. The minimum edge requirement for merlin in the Upper Midwest is >150 kilometers.

Discussion

The reasons for the high turnover rates are unknown. Hypothetically, the race occupying the area may be more nomadic, not showing the degree of fidelity as other populations, or the turn over rates are reflective of the bioenergetics and

physiological characteristics of a small raptor (i.e. short life span). Other factors may be an inadequate sample size, anthropogenic toxins and multiple natural factors (i.e. Nest availability and prey abundance). Importantly, the survivorship of young to breeding age is unknown. The latter parameter makes a definitive judgement to the health of the Voyageurs study group impossible.

The study duration to determine survivorship of merlin young and aspects of turnover at Voyageurs National Park would exceed 10 years. This in itself is a bare minimum considering the species is a pleistocene relic and this study is only three years out of the species cumulative existence in the region since the last glacial period.

Therefore long term monitoring of productivity and determination of the species occupancy within the region is imperative for it's long term management.

The merlin should be listed as a sensitive species in the state of Minnesota and it should be noted in the parks resource management plan. Subsequent monitoring of species, similar to the methods used at the Apostle Islands National Lakeshore, should be enacted at Voyageurs National Park. This action would be an alternative to intensive long term research, which is

unrealistic. To accommodate appropriate monitoring, habitat analyses should be completed.

Future Research

In 1991, I propose to perform phytosociological parameters (Curtis, 1959, Horn, 1975 and Greig-Smith, 1964) at merlin nests to analyze plant communities merlin use. The resulting recommendations would synergistically augment other community components. This action is justified since Voyageurs has the largest known breeding density of merlin in the Upper Midwest and in Minnesota. Additionally, merlin do not build their own nests and their site fidelity is questionable; specific site management seem illogical. Considering, eight historical records existed for merlin in Minnesota prior to the inception of this research project, it is interesting that at least that many nests are active within Voyageurs National Park annually. Therefore a community approach to their management within boreal environments is the most sensible long term approach to habitat preservation for the species within the park and in Minnesota.

Table 1. Measurements Taken on After Second Year Male Merlins from 1987-1990

Location	Date	USFWS Band #	weight (gms)	Wingchord (mm)	Wingchord Flat (mm)	Tail (mm)	Toe (mm)	Breast	Crop	Parasites
WI Julian Bay	7-4-87	1143-99296	149	189	190	111	28	4	0	none
MI Bell Harbor	7-19-88	1253-74501	142.4	195	198	117	28	4	0	none
MI Suzies Cave	7-18-88	1443-38322	156.4	186	190	129	29	4	0	none
VNP Stonewall	7-11-88	1443-38317	142.4	185	187	116	29	4	0	none
VNP Yodie Mainland	7-8-88	1443-38304	140.9	189	191	118	28	4	0	none
VNP 3 Sisters	7-10-88	1443-38313	156.9	192	195	112	28	5	0	none
VNP Mica Island	7-9-88	1443-38308	147.4	185	189	124	27	4	0	none
WI Michigan Island	7-7-88	1443-38303	150.8	193	196	118	27	4	0	none
VNP Cutover	7-18-89	1253-74581	152.8	191	193	118	28	5	0	none
VNP Brule East*	7-6-89	1253-74596	137.9	193	196	114	29	5	0	none
VNP North Gunsight*	7-7-89	1253-74595	150.3	193	195	115	29	5	0	none
VNP Dryweed	6-24-89	1253-74512	138.2	191	193	115	27	3	0	none
VNP Cajun Island*	6-23-89	1253-74511	140.4	191	193	115	28	5	0	none
VNP Juniper West	6-23-89	1253-74510	137.6	194	196	116	27	4	0	none
VNP Williams South	6-21-89	1253-74506	149.8	194	197	115	27	5	0	none
VNP Woodenfrog NE	7-3-89	1253-74524	155.9	187	190	113	29	4	0	none
VNP Tiny Woodenfrog	6-22-89	1253-74509	159.8	190	192	116	28	4	5	none
VNP Yodie Mainland**	6-21-89	1443-38304	140.9	187	190	115	28	4	2	none
VNP Cuculus	6-22-89	1253-74507	151	193	196	112	27	5	0	none
VNP Ash River	6-20-89	1253-74505	148.4	181	185	112	28	5	4	none
VNP Fox Island	7-6-89	1253-74600	145.8	192	193	119	28	4	-	none
VNP School Teacher	6-22-89	1253-74508	144.6	195	197	114	29	2	0	none
VNP 3 Sisters	7-16-89	1253-74582	144.0	186	188	114	27	5	0	none
VNP Kettle Falls*	7-7-89	1253-74594	151.8	192	194	113	28	5	0	none
WI Prentice Park	6-16-89	1253-74502	152.8	194	196	111	27	4	0	none
WI 2nd Landing	6-16-89	1253-75404	152.8	193	196	113	27	4	0	none
WI Ashland South	6-16-89	1253-74503	168	191	193	113	27	4	10	none
MI Suzies Cave	7-12-89	1253-74592	148.9	196	198	119	28	4	0	none
MI McGinties Cove	7-15-89	1253-74590	154.8	191	193	115	28	4	0	none
WI Superior Burbs	7-21-90	1253-97007	150.8	196	197	116	26	4	2	none
WI Trek and Trail	6-29-90	1253-74578	149.8	191	192	112	28	5	0	none
WI 2nd Landing**	6-28-90	1253-74504	153.1	193	195	113	28	5	0	none
VNP Fox Island	7-7-90	1253-74554	145.5	196	197	116	28	5	0	none
VNP Deerhorn	7-5-90	1253-74577	134.8	175	176	105	28	3	3	none
VNP Mica Island	6-23-90	1253-74564	148.5	189	190	112	28	4	0	none
VNP Echo Island	6-23-90	1253-74579	151.9	194	195	119	28	4	0	none
VNP School Teacher**	6-23-90	1253-74508	155.3	195	196	112	28	4	3	none
VNP 3 Sisters	6-16-90	1253-74582	145.3	165	187	110	28	4	0	none

* = Canadian Sites

* * = recapture, age (ATY)

Table 2. Measurements Taken on After Second Year and Second Year Female Merlins from 1987-90

Location	Date	USFWS Band #	Weight (gms)	Wingchord (mm)	Wingchord Flat (mm)	Tail (mm)	Toe (mm)	Breast	Crop	Parasites
WI Julian Bay	7-4-87	614-64101	226.6	219	220	129	36	5	0	Hippoboscidae
MI Suzies Cave	7-18-88	614-64142	211.1	209	211	127	32	3	0	none
MI Edwards Island	7-18-88	614-64143	209.1	209	211	126	31	3	0	none
VNP Stonewall	7-11-88	614-64116	219.9	219	221	123	30	4	0	none
VNP Mica Island	7-9-88	614-64109	219.9	203	205	124	32	4	0	none
VNP School Teacher	7-10-88	614-64112	200.3	211	214	130	32	3	0	none
VNP Wolf Pack	7-9-88	614-64106	202.6	207	209	126	31	3	0	none
VNP Cutover	7-18-89	614-64169	205.8	210	213	126	33	3	0	none
VNP Dryweed	6-24-89	614-64122	226	211	213	125	33	4	0	none
VNP Cajun Island **	6-23-89	614-64120	248.6	208	211	125	31	4	8	none
VNP Juniper West	7-4-89	614-64145	194.3	208	210	126	33	3	0	none
VNP Woodenfrog NE	6-22-89	614-64119	222.4	208	210	124	32	5	0	none
VNP Yodle Mainland	7-3-89	614-64129	213.8	212	215	120	33	3	0	none
VNP Cuculus	7-3-89	614-64133	229	212	217	128	34	3	0	none
VNP Ash River	7-3-89	614-64140	229.3	208	212	126	32	4	0	none
VNP School Teacher	6-22-89	614-64118	249.3	208	210	119	31	3	0	none
VNP 3 Sisters(SY)	7-16-89	614-64168	227.3	209	211	128	33	3	0	none
VNP Kettle Falls**	6-24-89	614-64121	230.8	219	221	131	33	3	0	none
VNP Namakan River**	7-5-89	614-64158	196.3	213	216	127	33	3	0	none
WI 2nd Landing(SY)	6-28-89	614-64128	210.2	213	217	131	33	3	0	none
WI Michigan Island	6-27-89	614-64123	221.3	204	206	124	33	5	0	none
WI Ashland So.(SY)	6-27-89	614-22306	224.5	216	218	126	35	4	0	none
MI Suzies Cave(SY)	7-12-89	614-64159	210.6	202	204	128	33	4	0	none
VNP Fox Island(SY)	7-7-90	614-64178	207	210	212	130	33	4	0	none
VNP School Teacher*	6-23-90	614-64168	220	210	211	119	33	4	0	none
VNP 3 Sisters	6-16-90	614-64172	245.8	210	212	129	33	5	5	Hippoboscidae
VNP Sexton Island	7-15-90	614-64179	211	209	210	120	33	5	0	none
WI 2nd Landing	6-28-90	614-64173	229.8	209	211	125	33	4	0	none
WI Turtle Flambeau	7-13-90	614-64185	238	212	215	125	33	5	0	none
WI Prentice Park(SY)	7-20-90	1204-08002	211	203	207	119	33	5	0	none

* = Recapture, Age After Third Year (ATY)

** = Canadian Sites

Table 3. Measurements Taken on Young of the Year Merlins - 1990

Location	Date	USFS Band#	Sex	Age(days)	Toe (mm)	Parasites
WI Julian Bay	6-12-90	egg collected-	-	-	-	none
WI Second Landing	6-28-90	614-64183	F	10-12	32	none
same		1253-74565	M		28	none
WI Trek and Trail	6-29-90	1253-74566	M	16-18	28	none
same		1253-74567	M		28	none
same		1253-74562	M		28	none
same		1253-74563	M		28	none
WI Turtle Flambeau	7-13-90	614-64181	F	18-20	33	none
same		614-64184	F		33	none
WI Superior Burbs	7-21-90	1253-97008	M	18-20	28	none
same		1253-97009	M		28	none
same		1204-08003	F		33	none
same		1204-08004	F		33	none
WI Prentice Park	7-20-90	Brancher	U	28+	-	none
same		Brancher	U		-	none
same		Brancher	U		-	none
same		Brancher	U		-	none
WI Red Cliff	7-19-90	Brancher	U	28+	-	none
same		Brancher	U		-	none
same		Brancher	U		-	none
same		Brancher	U		-	none
same		Brancher	U		-	none
same		Brancher	U		-	none
WI Sioux River	7-22-90	Brancher	U	28+	-	none
same		Brancher	U		-	none
same		Brancher	U		-	none
same		Brancher	U		-	none
same		Brancher	U		-	none
same		Brancher	U		-	none
VNP Echo Island	7-14-90	614-64174	F	16-18	33	none
same		614-64175	F		33	none
same		614-64176	F		32	none
same		1253-74575	M		28	none
same		1253-74576	M		28	none
VNP 3 Sisters	7-6-90	deserted	-	-	-	none
VNP Blind Pig	7-6-90	1253-97004	M	25+	28	none
same		Brancher	?		-	none
VNP Fox Island	7-7-90	1253-74568	M	11-12	28	none
same		1253-74569	M		28	none
same		1253-74570	M		28	none
VNP Sexton Island	7-15-90	Brancher	-	28+	-	none
same		Brancher	-	28+	-	none
same		Brancher	-	28+	-	none
same		Brancher	-	28+	-	none
VNP Mica Island	7-8-90	1204-08001	F	10-12	32	none
same		614-64182	F		32	none
same		1253-97002	M		28	none
VNP School Teacher	7-16-90	Brancher	-	28+	-	none
same (bad tree)		Brancher	-	28+	-	none

same		Brancher	-	28+	-	none
VNP Deerhorn	7-5-90	1253-74572	M	10-12	28	none
same		1253-74574	M		28	none
same		614-641200	F		31	none
VNP Dryweed	7-17-90	1253-97003	M	20-23	28	none
same		1253-97005	M		28	none
same		1253-97006	M		28	none



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