

1978

STUDENTS YEARLY REPORT

Moosehorn Nat'l Wildlife Refuge

Student Crew:

Timothy Lukas

Jay Barber

Gay Muhlberg

## Introduction

This paper summarizes the 1978 field work and discusses the results of the research performed at the Moosehorn N.W.R. Greg Sepik, with an M.S. in Wildlife Biology, headed the 1978 woodcock crew. Crew members included field work assistants Jay Barber, Tim Lukas and Gay Muhlberg. Dan McAuley and Eric Derleth were employed as federal wildlife technicians under the supervision of Tom Duyer, U.S. Fish and Wildlife Service biologist. Kathy Claerr and Jim Fougere\*, both employed at the visitor's center on the refuge, helped out occasionally with the banding procedures. Sara Brown, an intern from Unity College, helped the woodcock crew from early April until mid-June.

Field work began on April 3rd, with the mistnetting of singing males, and was completed on August 25th. The first six weeks of work consisted of putting new mistnets together and censusing and mistnetting singing males. Other duties involved spring burning of areas 77-31, 101, 100, 10, 39, 78-3, and part of 40, 7 and 78-4. In mid-May, with the aid of Andy Amman and his dog(S), broods of woodcock were located and banded throughout the refuge.

On May 22nd, with the arrival of Tim and Jay, the daily work routine changed. Traplines were hoed and woodcock wings were studied during this initial week. Beginning June 2nd, traplines were checked twice daily. Vegetative analysis of singing ground cuts were completed and mist nets were set up in the major fields 1, 10, 7, 39, 40, and 36. June 1st was the first evening of summer field mistnetting. Due to the scarceness of rain this summer, nightlighting data was very low.

Throughout the summer, woodcock plots were marked out and vegetative analysis, employing the prism method, was performed in designated areas. In early summer, Greg occasionally went out in the evening to call owls using a tape recorder, in future hopes of linking owls as major predators

of woodcock in the summer fields.

A typical day started at 8:00 AM with two crew members checking traps. The rest of the crew would either layout woodcock plots, conduct vegetation analysis or analyze data in the office. After lunch, two or three crew members would rearrange mistnets in the major fields, while the others would do miscellaneous chores. Field work would end at 4:00 PM, with traps being checked again at 6:30. Due to the unusually dry weather, traps were checked only in the morning of the last eight weeks of work. Mistnetting would take place in the summer fields between 8:00 and 9:30 PM or with proper

of woodcock in the summer fields.

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## Mistnetting of Singing Males

Mistnetting of courting males began on 3 April and continued through ~~2 June~~ encompassing a period of slightly more than seven weeks. Capture technique consisted of locating "peenting" males and determining their general flight direction when beginning and ending their courtship flights. Mist nets were placed across the probable flight paths and capture attempted the same day as placement. This technique proved very successful with few birds requiring more than a single evenings netting effort. In some instances more than one male could be captured at the same spot. Such captures may indicate the presence of subdominant males on a singing ground. In such cases it was often possible to determine the respective status of each bird. In addition to male birds, female birds were also occasionally captured. Such females were probably responding to the courtship displays of the singing male. Although cloud cover often affected light intensity and therefore the exact timing of the courtship flights, the spring weather was for the most part favorable and did not seem to affect the overall capture success.

### Results of Mistnetting of Singing Males

	<u>New</u>	<u>Return</u>	<u>Total</u>
SY M(dominant)	19	5	24
SY M(subdominant)	2	2	4
ASY M(dominant)	7	17	24
ASY M(subdominant)	0	1	1
Subtotals	28	25	53
Females	7	1	8
Totals	35	26	61

## Brood Search

Once again this year, Mr. G. A. Amman, retired biologist, used trained English Setters to locate woodcock broods for capture. Two weeks, 14 May thru 26 May, were spent searching likely looking brood cover. When one of the dogs, Katie or Patsy, froze on point, the area was approached and closely searched for hen and/or chicks. If possible, all were captured with hand nets. If the hen flushed before capture, the chicks were left in a cloth sack in the hope of luring the hen back for capture. All captured birds were banded, weighed, and the culmen length recorded. If possible, birds were also sexed and aged. Capture locations were flagged and later mapped. In addition to Mr. Amman, Dr. Ray Owen and Timothy Lukas utilized their Brittany Spaniels to contribute an occasional capture. The first brood was located by Amman on 14 May and the last, probably a renesting female, was found by Lukas on 16 June.

### Results of Brood Search

	<u>New</u>	<u>Return</u>
SY F	10	3
ASY F	5	4
Local(Hy)	96*	-

\* includes 4 known mortalities

1978 Trapline Analysis

Trapline	1	4	5	6	11	15	16	76	77
# cells	29	26	49	26	26	17	45	19	14
starting date	6/01/78-----								
ending date	8/23/78-----								
# birds	<del>65</del> 69	27 <sup>25</sup>	<del>45</del> 54 <sup>51</sup>	20 18	<del>25</del> 27	3	<del>22</del> 47	<del>25</del> 35	7 <sup>14</sup>
# days	83	83	83	83	83	83	83	83	83
# cell days	<u>2407</u> % <u>2158</u>		4067	2158	<u>2158</u>	<u>1411</u> /	<u>3569</u>	1577	<u>1162</u>
cell days/bird	<del>37.03</del> 34.88	<del>79.93</del> 74.41	<del>90.38</del> 75.31	<del>107.9</del> 119.89	<del>83.0</del> 79.93	470.33	<del>93.92</del> 75.94	<del>58.41</del> 45.06	<del>193.67</del> 83.0
birds/cell day	.029								

157

Summary of the Age and Sex of birds caught in traps

Trapline #	HY-M	HY-F	SY-M	SY-F	ASY-M	ASY-F	
1	<del>21</del> 22	<del>34</del> 36	34	1	<del>4</del> 5	0	68
76	85	913	2	87	1	4	32
4	89 1*	10	-	5	-	4	29
15	-	2	-	-	-	1	3
77	47	44	-	2	-	1	14
6	87 1*	5	1	-	2 2*	3	21
11	<del>12</del> 13	12	-	2	-	-	27
5	<del>18</del> 18	<del>21</del> 21	24	46	2	2	53
16	<del>20</del> 20	<del>20</del> 20	1	2	-	1	44
$\Sigma$	<del>916</del> 101	<del>1005</del> 123	<del>44</del> 121	<del>283</del> 25	<del>9</del> 10	<del>13</del> 16	

\*sex unknown

284  
297

291

Line 1: Analysis of Birds Caught

Trap #	I *	II	III	IV	V	VI
1-1 C	-	-	-	1 ✓	1 ✓	1
1-2 M	-	-	1 ✓	1 ✓	2 ✓	2
1-3 AL	-	-	1 ✓	2 ✓	3 ✓	1
1-4 C	-	-	-	1 ✓	4 ✓	-
1-5 M	-	-	-	5 ✓	2 ✓	-
1-6 AL	-	3 ✓	-	-	-	2
1-9 AL	-	-	-	2 ✓	-	2
1-10 AL	-	5 ✓	1 ✓	1 ✓	-	-
1-11 C	-	-	-	-	1 ✓	-
1-12 AL	-	-	1 ✓	1 ✓	-	-
1-13 C	-	-	1 ✓	-	2 ✓	1
1-14 M	-	-	1 ✓	1 ✓	7 ✓	2
1-15 C	-	-	1	1 ✓	3 ✓	2
Total	0	8	7	16	25	13

\* I June 2- June 15

II June 16 - June 29

III June 30 - July 13

IV July 14 - July 27

V July 28 - August 10

VI August 11 - August 23



Line 5: Analysis of birds caught

Trap #	I	II	III	IV	V	VI
5-1 AL	0	2	0	1	2	0
5-2 AL	0	1	1	1	0	0
5-3 AL	0	0	0	0	0	0
5-4.5 AL	0	0	0	1	0	0
5-5 AL	0	2	0	0	0	0
5-5.5 AL	0	0	1	0	0	0
5-6 AL	0	1	1	0	0	0
5-7 AL	1	0	0	0	0	0
5-8 AL	1	1	0	0	0	0
5-9 AL	0	0	0	0	0	0
5-10 AL	0	4	1	2	2	0
5-11 M	0	0	2	1	1	1
5-12 AL	0	2	1	0	0	0
5-12.5 AL	0	0	1	1	0	0
5-13 AL	1	2	3	4	4	0
5-14 M	0	3	1	0	0	0
Total	3	18	12	11	9	1

Line 6: # of birds caught

Trap #	I	II	III	IV	V	VI
1 AL	1	0	1	0	0	1
2 AL	0	1	1	0	1	0
3 AL	1	3	0	0	0	0
4 AL	0	1	0	0	0	0
5 AL	0	0	0	0	0	0
6 AL	0	0	0	0	0	0
7 AL	0	0	0	0	0	1
8 AL	0	1	1	0	0	1
9 AL	1	0	0	0	0	0
10 AL	0	0	1	0	0	0
11 AL	0	1	0	0	0	0
12 AL	0	0	0	0	0	0
13 C	0	0	0	0	0	0
14 AL	0	0	0	0	0	0
15 AL	0	0	0	0	0	0
Total	4 3	7	8 4	0	1	5 3

Line 11: Analysis of birds caught

Trap #	I	II	III	IV	V	VI
11-1 AL	1	1	2	3	1	0
11-2 AS	0	0	0	0	0	0
11-3 AS	5	0	0	0	0	0
11-4 AS	0	0	0	0	0	0
11-5 AL	2	1	2	0	0	0
11-6 AL	0	1	1	1	0	0
11-7 AL	0	0	0	0	0	0
11-13 AL	1	0	1	0	0	0
11-14 AL	0	0	0	0	0	0
11-15 AL	3	0	0	0	0	0
11-16 AL	0	0	0	0	0	0
11-17 AL	0	0	0	0	0	0
11-18 AL	0	1	0	0	0	0
Total	12	4	6	4	1	0

Line 16: Analysis of birds caught

Trap #	I	II	III	IV	V	VI
16-1 AL	0	0	0	0	0	0
2 AL	0	0	1	1	0	1
3 AL	0	0	0	0	0	0
4 AL	0	0	0	2	2	1
5 AL	0	0	1	2	1	0
6 M	0	0	0	1	0	0
7 M	0	1	0	1	1	0
8 AL	0	1	1	1	1	1
9 AL	0	1	0	0	0	0
10 AL	0	2	0	1	0	0
11 M	0	0	0	0	1	0
12 AL	0	0	1	1	1	0
13 AL	0	0	0	0	0	0
14 AL	0	2	1	0	1	0
15 AL	0	2	0	0	0	0
16 M	0	1	0	0	0	0
17 M	0	0	0	0	0	0
18 AL	0	0	0	0	0	0
19 AL	0	0	0	0	0	0
20 AL	0	0	1	0	0	0
21 AL	0	0	0	0	2	0
22 AL	0	0	0	0	3	1
23 AL	0	1	0	1	2	0
Total	0	10	6	11	15	4

Line 4: # of birds caught

Trap #	I	II	III	IV	V	VI
11 AL	0	0	0	0	0	0
12 AL	1	0	0	0	0	0
13 M	0	0	0	0	0	0
14 C.	0	0	0	0	0	1
15 C	0	0	0	0	0	0
22 M	0	0	1	0	0	0
23 M	1	1	0	0	0	0
25 AL	1	10	2	2	2	0
26 M	0	0	0	0	1	0
27 C	0	0	0	5	2	0
Total	3	11	3	7	5	1

Line 76: # of birds caught

1 AL	1	0	1	0	1	0
2 M	0	0	0	0	0	0
3 AL	1	2	2	0	5	0
4 AL	0	1	0	0	1	0
5 C	0	0	0	0	1	1
6 AL	0	0	0	1	1	1
7 AL	0	0	0	0	0	0
8 M	0	2	0	1	2	13
9 AL	0	0	0	0	1	0
Total	3	8	4	2	12	16
		5	5	3	13	6

Line 77: # of birds caught

Trap #	I	II	III	IV	V	VI
1 AL	0	1	0	0	1	0
2 AL	0	1	0	0	1	0
3 AL	0	3	0	0	0	0
4 AL	0	0	0	0	0	1
5 AL	0	0	1	0	1	2
6 AL	0	0	0	0	1	1
Total	0	5	1	0	4	4

Line 15: # of birds caught

Trap #	I	II	III	IV	V	VI
1 AL	0	0	0	0	0	0
2 AL	0	0	0	0	0	0
3 AL	0	0	0	0	0	0
4 AL	0	0	0	0	0	0
5 AL	0	0	0	0	0	0
6 AL	0	0	0	0	0	0
7 AL	0	0	0	0	0	0
8 AL	0	0	0	0	0	0
9 M	0	0	0	0	1	1
10 AL	0	0	0	0	0	0
Total	0	0	0	0	1	1

## MIST NETTING 1978

Field	Date	# Nets	# Birds	# HY	# SY	# ASY	# Birds/ Net	# Males	# Females
1	5/31	16	1	0	1	0	0.06	1	0
	6/12	24	3	3	0	0	0.13	2	1
	6/20	22	7	7	0	0	0.32	5	2
	6/26	22	8	8	0	0	0.36	5	3
	7/04	22	1	0	1	0	0.05	0	1
	7/10	22	13	13	0	0	0.59	7	6
	7/17	22	1	1	0	0	0.05	0	1
	7/24	22	0	0	0	0	0.00	0	0
	7/31	22	0	0	0	0	0.00	0	0
	8/14	22	0	0	0	0	0.00	0	0
	8/21	22	0	0	0	0	0.00	0	0
			<u>34</u>						
2	6/29	9	5	3	1	1	0.56	1	4
	7/06	9	2	1	1	0	0.22	0	2
	7/13	9	3	2	1	0	0.33	1	2
	7/20	9	2	2	0	0	0.22	0	2
	7/27	9	3	3	0	0	0.33	1	2
	8/10	9	0	0	0	0	0.00	0	0
	8/22	9	1	1	0	0	0.11	1	0
			<u>16</u>						
7	6/1	13	1	0	1	0	0.08	1	0
	6/10	13	2	2	0	0	0.15	0	2
	6/15	17	9	6	2	1	0.53	7	2
	6/21	17	8	8	0	0	0.47	5	3
	6/27	17	9	9	0	0	0.53	4	5
	7/05	16	4	4	0	0	0.25	1	3
	7/11	16	6	6	0	0	0.38	3	3
	7/18	15	4	4	0	0	0.27	2	2
	7/25	15	3	3	0	0	0.20	2	1
	8/22	15	0	0	0	0	0.00	0	0
			<u>46</u>						
10	6/12	16	1	1	0	0	0.06	1	0
	6/20	16	8	7	1	0	0.50	3	5
	6/26	16	7	7	0	0	0.44	5	2
	7/04	16	6	6	0	0	0.38	3	3
	7/10	16	14	14	0	0	0.88	10	4
	7/17	17	3	3	0	0	0.18	2	1
	7/24	15	0	0	0	0	0.00	0	0
	7/31	15	0	0	0	0	0.00	0	0
	8/14	15	0	0	0	0	0.00	0	0
	8/21	15	0	0	0	0	0.00	0	0
			<u>36</u>						
11	6/07	17	0	0	0	0	0.00	0	0
	6/14	17	0	0	0	0	0.00	0	0
	6/22	17	4	4	0	0	0.24	3	1
	6/28	17	6	6	0	0	0.35	4	2
	7/19	17	6	6	0	0	0.35	3	3
	7/26	17	4	4	0	0	0.24	3	1
	8/16	17	0	0	0	0	0.00	0	0
			<u>20</u>						

## MIST NETTING 1978

Field	Date	# Nets	# Birds	# HY	# SY	# ASY	# Birds/ Net	# Males	# Females
20	6/14	7	1	1	0	0	0.14	1	0
	6/22	7	1	1	0	0	0.14	1	0
	6/28	7	5	5	0	0	0.71	3	2
	7/05	7	2	2	0	0	0.29	2	0
	7/11	7	5	4	1	0	0.71	5	0
	7/18	7	1	1	0	0	0.14	1	0
	7/26	7	2	1	0	1	0.29	2	0
29			<del>17</del>						
	7/19	10	4	4	0	0	0.40	2	2
	7/25	10	1	1	0	0	0.10	1	0
	8/10	10	0	0	0	0	0.00	0	0
	8/22	10	0	0	0	0	0.00	0	0
36			<del>3</del>						
	6/07	10	1	0	1	0	0.10	0	1
	6/14	14	4	4	0	0	0.29	2	2
	6/22	14	4	3	1	0	0.29	2	2
	6/28	14	3	3	0	0	0.21	2	1
	7/06	14	0	0	0	0	0.00	0	0
	7/13	14	2	1	1	0	0.14	1	1
	7/19	14	3	3	0	0	0.21	3	0
	7/26	14	1	1	0	0	0.07	0	1
	8/02	14	0	0	0	0	0.00	0	0
	8/10	14	1	0	0	1	0.07	0	1
	8/21	14	0	0	0	0	0.00	0	0
39			<del>19</del>						
	6/06	7	0	0	0	0	0.00	0	0
	6/13	9	0	0	0	0	0.00	0	0
	6/21	9	0	0	0	0	0.00	0	0
	6/27	9	2	2	0	0	0.22	2	0
	7/11	9	0	0	0	0	0.00	0	0
40			<del>2</del>						
	6/06	8	1	0	1	0	0.13	0	1
	6/13	8	3	3	0	0	0.38	1	2
	6/21	8	0	0	0	0	0.00	0	0
	6/27	8	1	1	0	0	0.13	0	1
	7/11	8	1	1	0	0	0.13	0	1
78-45			<del>6</del>						
	6/15	10	0	0	0	0	0.00	0	0

Σ 201



## NIGHTLIGHTING

Nightlighting techniques for 1978 were similar to those of 1977. For instance, the age and sex of the birds were recorded, along with number of flushes, i.e. birds flushed out of the field, but not captured. Because of the unusually dry weather, the nightlighting data was very low this year. When the woodcock crew did go nightlighting, they were usually faced with conditions that were generally poor. Usually a heavy mist was prevalent, which would limit the penetrability of the lights, and subsequently many birds weren't "held" long enough to be brought to a landing to be netted. Thus, the catch success of the woodcock was lower than normal. On a few occasions, the banding crew went nightlighting on clear nights and did fairly well.

Past theories have stated that burning a blueberry summer field will cut back any thick vegetative growth, which will subsequently increase the usage of woodcock in that particular field. The nightlighting data in the past two years, however, does not support this theory to any great extent. For example, fields 1 and 10 were burned in 1977 and 1978, respectively. Data from either year shows no significant difference between the two fields as far as number of woodcock caught is concerned. The low amounts of nightlighting data prevents us from making any definite conclusions concerning the effects of burning on these and other summer fields.

This year, strips were mowed through the grass fields in hopes that the woodcock would roost in these respective strips. This practice seemed to work because approximately 70% of the birds flushed or captured were located in the mowed strips.

SUMMARY OF NIGHTLIGHTING SUCCESS OF MAJOR FIELDS IN 1978

[illegible]

TABLE SUMMARY OF NIGHTLIGHTING SUCCESS OF MAJOR FIELDS IN 1978

Field 20-										
Date	#Birds Caught	# Observers	# Hours in Field	# Man-hrs.	# Flushes	Total # Birds in Field	Total #Birds/Man-hrs.			
7-6-78	0	2	0.42	0.84	1	1	1.2			
7-29-78	0	3	0.25	0.75	1	1	1.3			
8-1-78	3	3	0.65	1.95	ND	ND	ND			
8-23-78	0	3	0.08	0.24	-	-	-			
Field 21-										
Date	#Birds Caught	# Observers	# Hours in Field	# Man-hrs.	# Flushes	Total # Birds in Field	Total #Birds/Man-hrs.			
7-6-78	1.80	9	3	8	1	-	-			
7-12-78	2.20	4	3	4	-	-	-			
7-29-78	3.40	3	4	3	-	-	-			
8-1-78	1.90	4	6	4	-	-	-			
8-8-78	0.37	1	1	1	-	-	-			
8-23-78	-	-	-	-	-	-	-			
Field 22-										
Date	#Birds Caught	# Observers	# Hours in Field	# Man-hrs.	# Flushes	Total # Birds in Field	Total #Birds/Man-hr.			
7-6-78	1.5	-	-	-	-	-	-			
7-12-78	-	-	-	-	-	-	-			
7-29-78	-	-	-	-	-	-	-			
8-1-78	-	-	-	-	-	-	-			

TABLE SUMMARY OF NIGHTLIGHTING SUCCESS OF MAJOR FIELDS IN 1978

-Field 7-									
Date	#Birds Caught	# Observers	# Hours in Field	# Man-hrs. in Field	# Flushes	Total # Birds in Field	Total # Birds/Man-hrs.		
7-7-78	1	2	0.42	0.84	0	1	1.2	Upper Barn Meadow (was just hayed)	**Barn Meadow strips
8-1-78	10***	3	1.25	3.75	ND	ND	ND		
8-8-78	4	4	0.92	3.68	4	8	2.17		
#Birds Caught/Man-hr.	#	#	# Hours in Field	# Man-hrs. in Field	# Flushes	Total # Birds in Field	Total # Birds/Man-hrs.		
1.20	-	-	-	-	-	-	-		
2.67	5	5	2	2	2	1	1		
1.10	2	1	1	1	-	-	-		
-Field 41-									
Date	#Birds Caught	# Observers	# Hours in Field	# Man-hrs. in Field	# Flushes	Total # Birds in Field	Total # Birds/Man-hr.		
7-6-78	4	3	1.42	4.3	11	15	3.5	Upper Barn Meadow (was just hayed)	**Barn Meadow strips
8-1-78	3	3	1.20	3.6	0	3	0.83		
8-3-78*	7	4	0.83	3.3	6	13	15.7		
8-3-78**	0	4	0.42	1.7	-	-	-		
8-8-78	8	3	1.20	3.6	15	23	6.4		
8-23-78	2	3	1.08	3.24	-	2	0.62		
#Birds Caught/Man-hr.	#	#	# Hours in Field	# Man-hrs. in Field	# Flushes	Total # Birds in Field	Total # Birds/Man-hr.		
0.93	3	3	1	3	-	-	-		
0.83	2	1	1	1	1	1	1		
8:40	2	5	2	3	-	-	-		
2.20	4	4	4	3	-	-	1		
0.62	2	2	2	2	-	-	-		

# 1978 Banding Results

	New Birds	Returns	New Bird Mortalities	Return Mortalities
HY M	158	-	3	-
HY F	145	-	6	-
HY ? (Local)	61	-	3	-
SY M	32	8	1	1
SY F	34	6	-	2
ASY M	11	23	-	-
ASY F	21	13	-	-

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YEARLY CAPTURE SUMMARY(BARING) 1964-1978

<u>Year</u>	<u>New</u>	<u>Returns</u>	<u>Repeats</u>	<u>Totals</u>
1964	221	17	110	348
1965	151	25	129	305
1966	249	20	135	404
1967	270	22	99	391
1968	191	24	116	324
1969	297	13	123	433
1970	175	31	86	292
1971	221	23	142	386
1972	335	23	173	531
1973	319	16	97	432
1974	381	30	184	595
1975	280	17	92	390
1976	294	20	122	436
1977	423	44	265	732
1978	474 <sup>*</sup> 13	53 <sup>**</sup>	257 <sup>***</sup> 28 229	784

New- a bird not previously banded

Return- a previously banded bird captured for the first time in that year


Repeat- capture of a bird which has already been caught in that year

- \* includes 13 birds known to be dead
- \*\* includes 3 birds known to be dead
- \*\*\* includes 28 captures of birds known to now be dead

## DISCUSSION

Although no statistical analysis have as yet been performed, certain relationships within the data seem to bear themselves out. Comparisons between years, however, must be done carefully due to the variability of the weather. The unusually dry summer this year has apparently affected the activity of the birds. Comparison of average temperature for the entire period May through August shows a difference of only two degrees between this year and last year. Rainfall averages for the same period show a much greater contrast. Average rainfall for this period in 1977 was 3.80 inches, as compared to 1.28 inches in 1978. This indicates that soil moisture in 1977 was at a relatively high level at the end of June. Thos year however, with no such period of rainfall, the birds have been subject to a moisture stress situation for the entire summer. With low moisture, earthworm availability decreases, meaning that the birds must spend more time to acquire a sufficient ammount of food. This results in the birds feeding over a larger area, increasing the opportunity for capture in ground traps. This is strongly reflected in our data by a marked increase this year in number of birds caught per cell. (1.024 in 1978 versus only 0.631 in 1977). This increased energy expenditure spent aquiring food. In order to assure that this lessened net gain will still be sufficient for survival, the birds must limit other energy expenditures. Since flight is a high energy requiring activity, the apparant decrease from last year in usage of summer fields may only be a means of conserving energy by eliminating the flight into the field.

Similarly, effects of management practices can be evaluated by examining the trapline and mistnetting data. Conclusions based on night-lighting data would be tentative at best due to the limited amount of data. By collecting data on managed areas and comparing it to those areas prior to



management, or to control areas where no management is practiced, it is possible to determine the effect of various management techniques on bird usage as reflected in trapping and netting success.

Management practices include herbicide strips, clearcut strips, burning to control vegetation, and elimination of regeneration in the summer fields. Herbicide and clearcut strips are designed to regenerate or create the early successional stages the birds favor. In addition, the clearcut strips may, for the first few years following cutting, be utilized as singing grounds by courting males. Since these courting males appear to attract females which later nest in the area, it is expected that these strips will receive usage from their broods. Looking at trapline 11, where herbicide strips were put in, there has been an increase in capture success as reflected in cell days/bird. Likewise, success on line 76 where clearcut stripes were created has also increased. On line 5, where clearcut strips were put in during 1973, capture success is now beginning to decrease. Apparently this reflects that the strips have passed their period of peak use. As regeneration progresses, the strips are becoming less favorable habitat than the earlier years.

The use of controlled burning is done in order to maintain the summer fields in a condition attractive to the birds. As succession progresses and the low relative open ground cover of a blueberry type field gives way to sweet fern, spirea, and young forest regeneration usage of the field as a night roost drastically declines. Yearly burning of the fields encourages growth of low, open cover. The less desirable growth is limited to that attainable in a single growing season. The immediate effects on bird usage of yearly burning is evident in both 1977 and 1978. In 1977 when field one was burned



and field ten was not, the mistnetting data shows a definately greater capture rate per net in field one. Then, in 1978 when field ten was burned and field one was not, the trend is reversed with a greater capture rate in field ten. A few more yearly rotations of this type should make it possible to more conclusively tie these changes to the burning. The exact habitat requirements of the woodcock are gradually being defined. Future research must aim toward a more accurate understanding of the effects of different management techniques.

## CRITIQUE OF SUMMER'S WORK

The 1978 summer field work at the Moosehorn refuge was a very productive and educational experience. Although sometimes tedious there was usually sufficient variety in the work to keep it interesting. The use of the trained bird dogs was highly effective in gathering brood data as well as simply maximizing the number of birds banded. The number of persons involved in this project could possibly be reduced with 3 or 4 people per working dog probably being sufficient. The availability of the YCC, YACC, and the vocational school, to carry out the desired habitat manipulation such as clear cutting and strip cuts was invaluable. Having their assistance made it possible for the woodcock crew to devote more time to those activities directly related to the collection of research data.

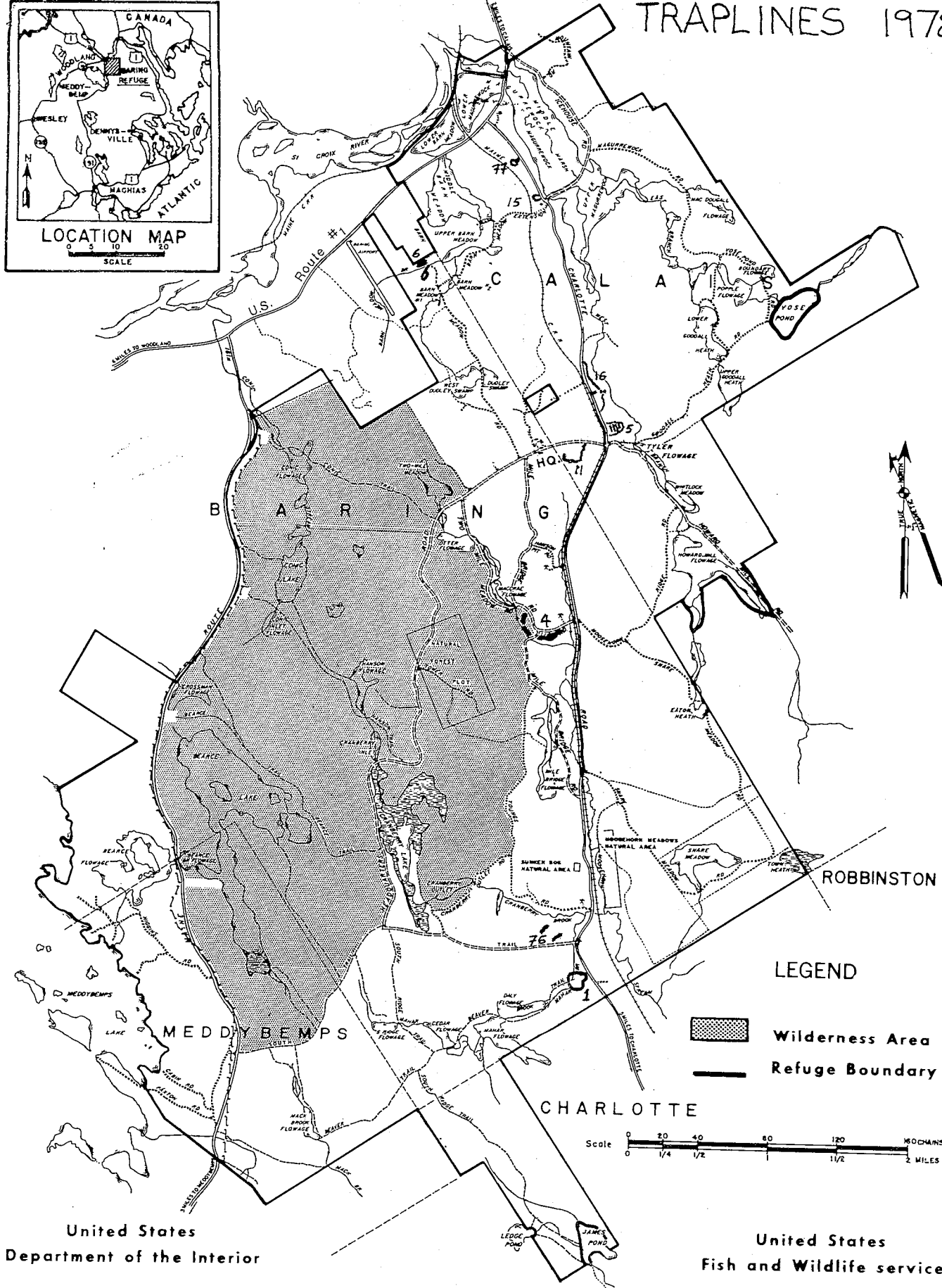
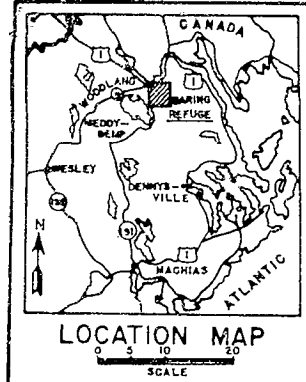
When checking the traplines only once a day it is suggested that they be checked between 10:00 and 12:00 noon. Checking the traps at 8:00 a.m. as was done this year results in a number of flushed birds. It is possible that these birds are still actively feeding and would enter the trap if not disturbed. Checking the traps at this time of day when bird activity is low will reduce the number of woodcock that remain in the traps for an entire day. Most captures will be made in the evening or early morning with few if any during the hot afternoon period.

Closer attention must be given to furling all mist-nets after use as well as maintaining them in the furled position following periods of inclement weather.

Updating equipment and maintaining all equipment in good operable condition will insure smoother operations. Checklists of equipment required for the various operations such as earthworm analysis, vegetation analysis, etc., will increase actual time spent in the field.

Overall it was a highly successful year with more birds banded and more birds captured than in any previous year. With some cooperative weather and a little luck next year should prove equally as good.

# TRAPLINES 1978



United States  
Department of the Interior

United States  
Fish and Wildlife service

## Moosehorn National Wildlife Refuge

Washington County Maine

