

9-2012

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Grenon, Betty and Schmid, Rick, "Summary and Comparisons of the Fontenelle Forest and Boyer Chute MAPS Stations in Nebraska" (2012). *Nebraska Bird Review*. 1300.

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SUMMARY AND COMPARISONS OF THE FONTENELLE
FOREST AND BOYER CHUTE MAPS STATIONS IN NEBRASKA

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This report provides results and comparisons of two Monitoring Avian Productivity & Survivorship (MAPS) stations operated in central eastern Nebraska. MAPS is a multi-national research project managed by the Institute for Bird Populations (IBP) in Point Reyes, CA (<http://www.birdpop.org/maps.htm>). The project is designed to monitor the population trends and breeding success of breeding birds in North America. Each year, more than 500 participants throughout North America collect data (via the process of bird banding) according to strict protocols and then submit their data to IBP for analysis and interpretation. MAPS began in 1989, and similar studies have subsequently begun on wintering grounds in Latin America.

The Fontenelle Forest site (FONT) was operated from 1990-1998, and the Boyer Chute National Wildlife Refuge site (BOCH) ran from 2001-2010. Both sites are located on floodplain land approximately one half-mile from the Missouri River. The stations are approximately 25 miles apart with the BOCH site north in Washington county and the FONT site south in Sarpy county.

FONT is forested mainly with sycamore, white elm and cottonwood trees with a red osier dogwood and red mulberry understory. Ground cover was composed primarily of stinging nettle, bedstraw and forbs. A small stream runs on the western edge of the site and pastureland on the eastern edge. All ten mist nets were located within forested areas.

BOCH is wooded more openly with cottonwood, red mulberry and red osier dogwood with the open areas dominated by brome grass and abundant poison ivy. Adjacent to the banding area to the east is a restored prairie dominated by switchgrass, big bluestem and side-oats gramma. A chute of the Missouri River runs

along the western border. One mist net was located within the prairie area; the other nine were in the wooded edges.

Both sites were subjected to serious flooding that virtually eliminated a banding season; FONT in 1993 and BOCH in 2010. Continuing swampy conditions and a major tree-felling storm eventually closed the MAPS project at the FONT location, while two sequential years of floods closed the BOCH site. A new site was initiated in 2011 on Neale Woods, a property owned by Fontenelle Forest. It has been in operation for two years. The FONT site operated in the early years of the MAPS program, during which major and minor adjustments in the MAPS protocol were implemented, which may have affected the results.

Both sites were basically operated with ten nets (BOCH had only nine nets the first year) for the standard protocol of six hours (beginning at dawn) once each ten-day

Table 1 Summary of effort and results.

Fontenelle Forest				Days	Net Hours	Species Banded	Birds per 10 net hrs
Banded	Recaptured	Total					
1990	76		76	9	555	18	1.4
1991	75	20	95	10	554	19	1.4
1992	146	32	178	9	540	26	2.7
1993	9	5	14	2	70	2	1.3
1994	90	29	119	9	474	23	1.9
1995	139	22	161	9	540	29	2.6
1996	105	43	148	9	540	19	1.9
1997	49	23	72	7	420	18	1.2
1998	120	24	144	6	363	25	3.3
Total	809	198	1007	70	4056	44	2.5

Boyer Chute				Days	Net Hours	Species Banded	Birds per 10 net hrs
Banded	Recaptured	Total					
2001	206	23	229	7	324	26	6.4
2002	211	52	263	7	420	32	5.0
2003	157	58	215	8	402	29	3.9
2004	157	50	207	9	346	28	4.5
2005	182	38	220	7	401	29	4.5
2006	174	52	226	7	394	27	4.4
2007	162	35	197	7	410	30	4.0
2008	136	34	170	7	405	30	3.4
2009	131	31	162	7	340	22	3.9
2010	37	7	44	2	120	14	3.1
Total	1,553	380	1933	68	3563	47	5.4

Table 2 Top ten species banded, showing recaptures as a percent of individuals banded.

Fontenelle 1990-1998	Species	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total	Recaps	Recap %	
House Wren		16	17	42	8	25	25	24	19	22	198	58	29%	
America Robin		7	13	20	1	15	24	11	1	11	103	7	7%	
Black-capped Chickadee		13	6	9		9	16	4	7	13	77	8	10%	
European Starling		2	6	4		7	15	9	2	14	59	7	12%	
Downy Woodpecker		3	5	3		10	6	14	2	7	50	7	14%	
Baltimore Oriole		5	3	9		1	4	6		9	37	1	3%	
Blue Jay		6	4	8		4		2	1	6	31	1	3%	
Indigo Bunting		3		5			7	3	3	5	26	4	15%	
Northern Cardinal		3	3	1		4	1	3	2	4	21	5	24%	
Red-headed Woodpecker		2	3	4		1	3	1	1	1	16	1	6%	
Boyer Chute 2001-2010	Species	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total	Recaps	Recap %
House Wren		32	32	25	15	19	31	30	15	23	10	232	75	32%
Orchard Oriole		40	22	18	21	25	29	23	22	15	3	218	78	36%
American Robin		12	7	24	26	41	18	19	1	8		156	4	3%
Baltimore Oriole		26	19	9	6	13	14	5	22	27	4	145	31	21%
Rose-breasted Grosbeak		14	14	11	11	8	8	8	9	12	5	101	42	42%
Gray Catbird		15	18	7	7	6	12	3	6	4	1	79	38	48%
Common Yellowthroat		4	9	3	14	13	9	10	5	3	1	71	35	49%
Black-capped Chickadee		7	11	5	6	3	6	4	4	8	2	56	12	21%
American Goldfinch		7	11	3		2	4	3	4	2		36	5	14%
Eastern Bluebird				5	7	5	1	2	3	5		36	0	0%

Table 3 Ages of 10 most frequently captured species.

Fontenelle Forest						
Number	Species	HY	SY	ASY	AHY	UNK
198	House Wren	46			151	1
103	American Robin	49			53	1
77	Black-capped Chickadee	16			50	11
59	European Starling	13	12	12	22	
50	Downy Woodpecker	19	2		29	
37	Baltimore Oriole	2	9	7	17	2
31	Blue Jay	3			27	1
26	Indigo Bunting		1	3	21	1
21	Northern Cardinal	3	2		16	
16	Red-headed Woodpecker	1		1	14	

Boyer Chute						
Number	Species	HY	SY	ASY	AHY	UNK
232	House Wren	46	27	113	44	2
218	Orchard Oriole	48	82	79	9	
156	American Robin	108	28	15	5	
145	Baltimore Oriole	69	27	45	3	1
101	Rose-breasted Grosbeak	13	35	49	4	
79	Gray Catbird	3	21	41	14	
71	Common Yellowthroat	8	13	43	7	
56	Black-capped Chickadee	18	14	17	7	
36	American Goldfinch		5	31		
36	Eastern Bluebird	27	3	6		

HY=Hatch year
SY=Second year

ASY=After Second year
AHY=After Hatch year

UNK=Unknown

period from May 31 to August 8. The FONT site ran with two additional periods (nine total) in 1990 starting May 11, but had dropped to seven periods by May 31, 1997 due to the recognition of the migration timing. Since the study focuses on breeding birds, it is not useful to catch migrants. An annual average of 5.4 birds was banded per ten net hours at BOCH versus 2.5 birds banded per ten net hours at FONT. (Table 1) This resulted in 1,553 total birds banded at BOCH compared to 809 at FONT even though FONT operated 13.8% more hours than BOCH during the study.

The total number of species banded did not vary significantly at the two sites: FONT 45, BOCH 46. FONT's 198 recaptures consisted of 128 individuals of 23 species representing 24.6% of the total birds banded. BOCH's 380 recaptures consisted of 226 individuals of 24 species representing 24.1% of the total birds banded. (The reason the "number of individuals" is less than the "number of recaptures" is that several birds were recaptured multiple times.) Of the birds banded, approximately 31 species at FONT and 28 species at BOCH were migratory birds using the area primarily for nesting. In addition to banding, MAPS participants record data on all birds seen, heard or captured (whether banded or not) during the study. In total, 78 species were encountered or observed at FONT and 85 at BOCH.

The unbanded birds are not included in this analysis as the protocol for counting them was misinterpreted in the first year at both sites. However, several species were captured in the nets that were not banded. Species that were not banded included House Sparrows and Ruby-throated Hummingbirds at FONT and Mourning Doves, Northern Bobwhites, a single Sedge Wren and one Sharp-shinned Hawk at BOCH.

For all years, the top ten most commonly banded birds (Table 2) included 76% of the total banded at FONT and 72% at BOCH. The most numerous species at both sites was the House Wren, but both sites share only four species on the top ten listings. These were House Wren, American Robin, Black-capped Chickadee and Baltimore Oriole. BOCH had thirteen species that were not banded at FONT and FONT had 11 species that were not banded at BOCH. (Table 5)

The FONT warblers reflect the more forested habitat while the BOCH sparrows and swallows demonstrate the bordering prairie and river chute. The Swainson's Thrush, Lincoln's Sparrow, Black-and-white Warbler and Mourning Warbler at FONT were likely migrants banded before the periods were reduced to seven. The remaining birds on the FONT list are nesters. Likewise the annual presence or absence of Grasshopper Sparrow, Dickcissel and the swallows at BOCH were subject to prairie burns and water levels in the chute.

Table 4 Aged migratory species.

Fontenelle Forest Species	Original Date	Original Age/Sex	Other Years	Latest Age	Estimated Age in Yrs
American Robin	6/9/90	AHY-M	91,95	AHY	at least 7 yrs
Brown-headed Cowbird	6/3/95	HY-U	96,97	AHY-F	3 yrs
Eastern Towhee	6/26/86	by RG	96	AHY	at least 10 yrs
Eastern Wood-Pewee	6/3/95	AHY-M	96,98	AHY	at least 4 yrs
Great-crested Flycatcher	6/9/90	AHY-M	91	AHY	at least 2 yrs
House Wren	6/7/92	AHY-F	98	AHY	at least 7 yrs
Indigo Bunting	8/20/95	AHY-M	97	ASY	at least 4 yrs
Red-eyed Vireo	5/30/92	AHY-F	94	AHY	at least 3 yrs
Red-headed Woodpecker	7/1/95	AHY-U	96	AHY	at least 2 yrs

Boyer Chute Species	Original Date	Original Age/Sex	Other Years	Latest Age	Estimated Age in Yrs
American Goldfinch	6/22/01	ASY-F	01,02	ASY	over 5 yrs
American Robin	7/8/01	AHY-M	02,03,06	ASY	at least 5 yrs
Baltimore Oriole	6/22/01	ASY-M	01,02,03,05,	ASY	over 7 yrs
Brown-headed Cowbird	6/7/03	HY-U	03,04,06,	ASY-F	4 yrs
Brown Thrasher	6/5/02	ASY-M	02,06	ASY	over 4 yrs
Common Yellowthroat	7/12/02	ASY-M	02,04,05,06	ASY	over 7 yrs
Common Yellowthroat	8/3/02	HY-U	08	ASY-M	7 yrs
Field Sparrow	7/2/05	SY-M	06	ASY	3 yrs
Great-crested Flycatcher	6/29/02	AHY-U	05	ASY-U	at least 5 yrs
Gray Catbird	6/2/01	AHY-M	03,04,05	ASY	at least 6 yrs
Orchard Oriole	6/12/04	ASY-M	04,06,07,10	ASY	over 10 yrs
Rose-breasted Grosbeak	7/27/02	SY-M	03,05,07	ASY	7 yrs
Red-headed Woodpecker	6/21/03	ATY-F	04,08	ATY	over 7 yrs
Warbling Vireo	6/2/01	AHY-M	02	ASY	at least 3 yrs

HY=Hatch year
SY=Second year

AHY=After Hatch year
ASY=After Second year

ATY=After third Year

Table 5 All species banded.		
Species	Fontenelle Total	Boyer Chute Total
Yellow-billed Cuckoo	1	2
Red-headed Woodpecker	16	10
Red-bellied Woodpecker	10	19
Downy Woodpecker	50	26
Hairy Woodpecker	9	7
Northern Flicker	15	18
Eastern Wood-Pewee	13	18
Yellow-bellied Flycatcher		1
Acadian Flycatcher	1	1
Alder Flycatcher		10
"Traill's" Flycatcher		5
Willow Flycatcher	2	10
Least Flycatcher	3	
Great Crested Flycatcher	11	16
Eastern Kingbird	1	21
Warbling Vireo		31
Red-eyed Vireo	13	1
Blue Jay	31	35
Tree Swallow		7
Northern Rough-winged Swallow		10
Barn Swallow		3
Black-capped Chickadee	77	56
Tufted Titmouse	5	
White-breasted Nuthatch	15	26
Brown Creeper	6	
House Wren	198	232
Carolina Wren	4	1
Eastern Bluebird	5	36
Swainson's Thrush	2	
Wood Thrush	4	9
America Robin	103	156
Gray Catbird	11	79
Brown Thrasher	1	24
European Starling	59	4
Cedar Waxwing		8
Ovenbird	2	1
Prothonotary Warbler	1	
Black & White Warbler	1	
Mourning Warbler	1	
Common Yellowthroat	7	71
American Redstart	3	1
Northern Parula	2	
Yellow Warbler	2	3
Yellow-throated Warbler	1	
Eastern Towhee	3	

Species	Fontenelle Total	Boyer Chute Total
Field Sparrow		28
Grasshopper Sparrow		5
Song Sparrow		3
Lincoln's Sparrow	1	
Northern Cardinal	21	22
Rose-breasted Grosbeak	5	101
Indigo Bunting	26	10
Dickcissel		13
Common Grackle	12	8
Brown-headed Cowbird	14	5
Orchard Oriole		219
Baltimore Oriole	37	145
American Goldfinch	4	36
Total All Years	809	1553

Age ratio percentages for the top ten banded birds are shown in Table 3. Owing to the more advanced ageing protocol instituted by IBP over the time span, the FONT birds were aged with more general criteria resulting in higher numbers of After Hatch Years (AHYs) and Unknowns (UNKs) than were recorded at BOCH. Sex ratios for all birds banded are pretty evenly split at FONT: male 32%, female 37%, and unknown 31%. At BOCH females were slightly more common; males 36%, females 42% and unknown 22%. This could be a product of the more in-depth coding analysis. Table 4 presents some of the older birds by station; only migratory species were considered. The two oldest birds, over 10 years, were an Eastern Towhee banded in FONT by Ruth Green in 1986 before the MAPS station was established and an Orchard Oriole quite faithful to its BOCH site beginning in 2004 as an After Second Year (ASY) bird.

The information provided by the MAPS program is proving very useful in developing land management ethics nationwide and very interesting on a local basis for our knowledge of Nebraska breeding birds. Some observations raise questions for further study, such as the apparent larger number in some species of females recaptured within a year compared to males and the also seemingly larger number of males recaptured in subsequent years compared to females. This might indicate the roles of the female's site fidelity and the male's site selection.

These two stations were operated by banders Betty Grenon, Craig Hensley and Rick Schmid. Volunteer assistance over 20 years included the following: Patty Albright, Elliott Bedows, Jim Beebe, Ruth Bentzinger, Sharon Draper, Bob Fuchs, Lois Inskeep, Anna Keenan, Marge Knudsen, Jason Krug, Tad Leeper, Lorinda Langner, Jessica Larson, Don Maas, Sue Mattix, Jay Parsons, Jay Schneider, Michelle Widhalm, and Penny Zahurones. Thanks also go to Fontenelle Forest and the Boyer Chute National Wildlife Refuge for support and access to their properties.