

RED-BREASTED NUTHATCHES AND THE WINTER OF 1993-1994

by William E. Davis, Jr., and Wayne R. Petersen

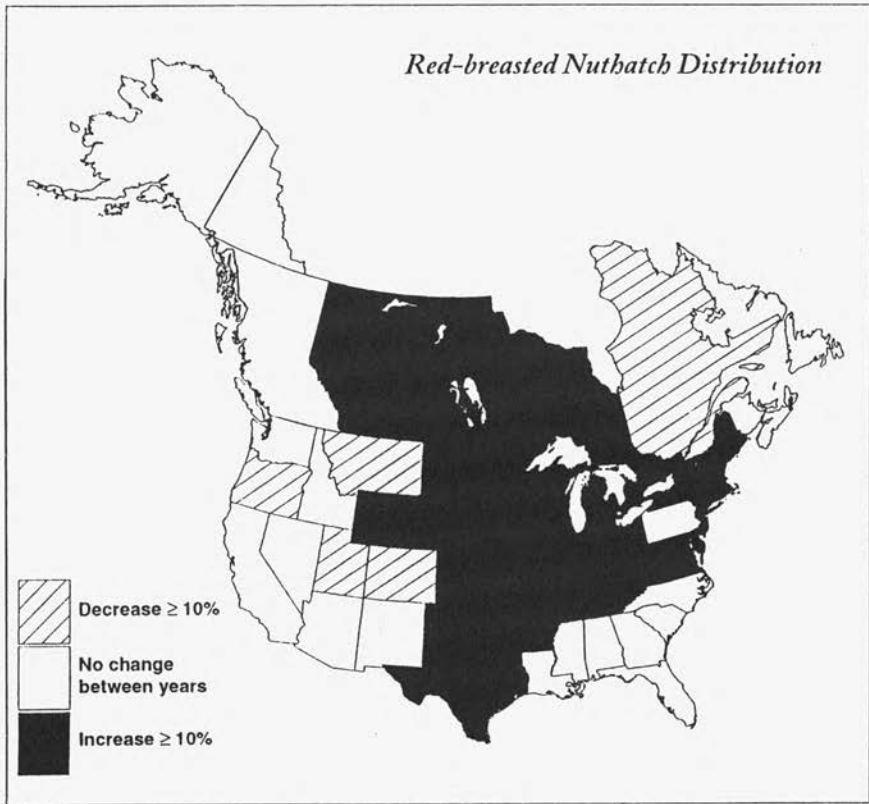
Large-scale movements of birds in fall and winter away and usually south from their normal wintering grounds are called "irruptions," or "invasions." Species characteristically involved in such movements are termed "irruptive species." More specifically, these species are said to be "eruptive" *from* their point of origin (i.e., breeding grounds) and "irruptive" *into* other areas (i.e., wintering areas). Years when irruptions occur are called "flight years" (Kricher 1988). For a more complete discussion of irruptions and irruptive species, see Forster (1990) and DeVore (1993).

There is evidence that these irruptions (i.e., invasions) are caused by major food shortages, particularly berries and seeds, over large geographical areas (Bock and Lepthien 1976). Typically, an invasion winter for a given species is preceded by one or more bumper food crop years, which often makes possible especially high breeding success during the breeding season(s) prior to the invasion. More important, however, is the fact that occasionally bumper food crop years are followed by seasons of significant failure in the seed or berry crop that only months before was superabundant. It is the relationship between these fluctuating events that sets the stage for a winter invasion.

Among passerine species exhibiting the most dramatic fluctuations in numbers from year to year are Red and White-winged crossbills, Common Redpolls, Pine Siskins, and Pine and Evening grosbeaks. While often not as conspicuously variable in their winter numbers as the species listed above, Red-breasted Nuthatches are, nonetheless, an irruptive species. Bock and Lepthien (1972), using Christmas Bird Count (CBC) data from 1950-1970, identified major southward irruptions of Red-breasted Nuthatches in the winters of 1951, 1954, 1955, 1957, 1959, 1961, 1963, 1965, 1968, and 1969. Veit and Petersen (1993) further illustrated this point for the years 1977 and 1988, and CBC data suggest that irruptions also occurred during the winters of 1989, 1990, and 1993. The winter irruption of 1993-1994 is the focus of the discussion that follows.

One of the largest invasions of Red-breasted Nuthatches to ever reach the northeastern United States occurred during the winter of 1993-1994. This event was noted by Tessaglia and Rosenberg (1994), Nikula (1994), and Petersen (1994). Apparently, the invading nuthatches reached most of the northeastern and central United States and most of southern Canada except for Quebec. The Cornell Laboratory of Ornithology's Project FeederWatch reported that Red-breasted Nuthatches began visiting feeders singly or in pairs as early as August and September 1993 (Tessaglia and Rosenberg 1994), and Kaufman (1994) highlighted the extent and magnitude of the event throughout the 1993 fall migration. Figure 1 illustrates the very large area of North America over which

Figure 1. Distribution of Red-breasted Nuthatches during the Winter of 1993-1994 compared with the Previous Winter of 1992-1993
 Shading indicates changes in the percentage of feeders visited in each state or province. Reprinted with permission from the editor of *Birdscope*, Cornell Laboratory of Ornithology, Ithaca, New York.



FeederWatchers recorded at least ten percent more feeders visited by Red-breasted Nuthatches during the winter of 1993-1994 as compared with the previous winter. Nuthatch distribution remained virtually unchanged after the fall migration and throughout the winter.

Table 1 shows Red-breasted Nuthatch totals for twenty-nine Massachusetts CBCs from 1986-1994. The magnitude of the 1993-1994 invasion is clear from the numbers in the table. For example, the 1993-1994 cumulative total of Red-breasted Nuthatches reported on twenty-eight counts greatly exceeded any previous cumulative total during the time period; the 1993-1994 nuthatch totals for thirteen of the twenty-eight counts greatly exceeded previous high counts during the nine-year period; and several counts in 1993-1994 exceeded by at least a factor of four the previous count maximum for Red-breasted Nuthatch.

**Table 1. Red-Breasted Nuthatch
Christmas Bird Count Data from 1986-87 to 1994-95**

	86-87	87-88	88-89	89-90	90-91	91-92	92-93	93-94	94-95
AN	-	-	-	-	76	10	5	46	15
AT	16	34	11	52	106	23	34	743	31
BB	19	20	9	19	4	1	4	33	10
CA	25	4	18	22	4	8	15	47	5
CC	7	2	2	16	4	2	14	10	2
CB	7	12	8	29	26	26	15	24	48
CO	16	51	3	6	301	19	25	195	17
GB	9	1	0	25	59	9	8	40	1
GR	5	19	11	13	36	13	9	62	11
MA	1	3	0	77	2	1	4	7	0
MV	55	7	5	31	18	6	24	22	2
MC	38	1	2	27	10	1	4	18	1
MI	14	69	1	5	82	4	-	182	13
NA	25	44	26	116	32	21	10	49	2
NB	2	1	1	9	2	0	1	2	0
NP	68	21	9	25	94	22	29	54	30
NO	28	36	25	63	65	13	34	295	20
NE	3	2	2	15	5	3	6	16	1
PL	0	3	4	55	13	5	8	42	7
QU	-	-	48	227	218	82	86	1886	63
QN	4	9	0	1	6	2	10	55	0
SP	9	117	4	20	44	6	37	311	11
ST	-	0	3	3	0	9	2	1	1
TA	0	2	4	59	6	0	5	24	0
TU	1	0	0	0	1	0	0	-	0
UX	2	25	1	9	81	12	1	355	4
WM	3	10	5	18	34	2	7	60	14
WP	24	7	0	3	0	0	1	6	0
WO	5	20	5	19	115	6	19	165	3
Total	386	520	207	964	1444	306	417	4750	312
Aver.	14.8	19.3	7.4	34.4	49.8	10.6	14.9	169.6	10.8

AN = Andover; AT = Athol; BB = Buzzard's Bay; CA = Cape Ann; CC = Cape Cod; CB = C. Berkshire; CO = Concord; GB = Greater Boston; GR = Greenfield; MA = Marshfield; MV = Martha's Vineyard; MC = Mid Cape; MI = Millis; NA = Nantucket; NB = New Bedford; NP = Newburyport; NO = Northampton; NE = N. Berkshire; PL = Plymouth; QU = Quabbin; QN = Quincy; SP = Springfield; ST = Stellwagen; TA = Taunton-Middleboro; TU = Tuckernuck; UX = Uxbridge; WM = Westminister; WP = Westport; WO = Worcester; Total = Total number of birds during the CBC period; Aver. = Average number of individuals per count area per year; - = No data available.

Data from annual compilations by Robert H. Stymeist, and recently by Marjorie W. Rines and Robert H. Stymeist, published annually in *Bird Observer*. Supplemental data from published CBC data in *American Birds*. The raw data were not corrected by party hours because party hours have remained fairly consistent during the last decade in most of these counts.

Curiously, the 1993-1994 irruption of Red-breasted Nuthatches coincided with obvious irruptions of at least three other species—Bohemian Waxwing, Pine Grosbeak, and Common Redpoll. Bohemian Waxwings staged their greatest and possibly most widespread New England invasion on record (Forster 1994). Unlike Bohemian Waxwings, the more modest numbers of Pine Grosbeaks were seemingly most concentrated in north-central Massachusetts. Common Redpolls, on the other hand, were both numerous and widespread throughout much of the Northeast. The explanation for this simultaneous irruption of four species with somewhat differing food preferences remains obscure. Most likely, a coincidental failure of a variety of seed and berry crops in boreal Canada, possibly coupled with an exceptionally successful breeding season the previous summer, may be the answer. It is not, however, the intent of this note to explain these concurrent irruptions; rather, it is to highlight their occurrence.

On a finer scale, the Red-breasted Nuthatch irruption was also impressive. Davis has conducted a Winter Bird Population Study count for the past eighteen years on a 29.2 acre maple-pine-oak second-growth forest study plot in Foxboro, Norfolk County, Massachusetts (Davis 1979). The results of these counts have been published annually in *American Birds* and the *Journal of Field Ornithology: Supplement*. During the 288 census hours prior to the 1993-1994 season, only one Red-breasted Nuthatch had ever been recorded. In 1993-1994 on six of the twelve one-hour census efforts, a total of twelve Red-breasted Nuthatches was recorded. Compared to the eighteen-year average, the number of nuthatches seen per hour this year was 288 times as great!

A final point pertaining to the 1993-1994 Red-breasted Nuthatch irruption is its correlation with a local bumper crop of white pine cones. Consistently, in Massachusetts at least, the most impressive concentrations of nuthatches during the 1993-1994 irruption were in white pine stands where there were excessive numbers of cones on the tops of the trees. The affinity of foraging Red-breasted Nuthatches for white pines and white pine groves is well known and has been previously observed by both authors. Additionally white pine groves actually seem to be a requirement for breeding in certain areas, such as in southeastern Massachusetts where extensive groves of other conifer species are often lacking (Veit and Petersen 1993). Whether it is actually the pine seeds that are sought by foraging nuthatches in winter, or arthropods associated with the pines and their cones, is a point requiring further investigation. Petersen, however, has unambiguously observed Red-breasted Nuthatches feeding on pine seeds that have fallen on the ground or snow beneath white pines.

The Red-breasted Nuthatch is certainly one of the most interesting and charming of our winter birds, and its erratic and unpredictable winter forays into Massachusetts most welcome, particularly when they occur in such numbers as in the winter of 1993-1994. Because the Red-breasted Nuthatch's natural history,

especially its winter movements, is still incompletely understood, it is a species deserving of further study by local field ornithologists.

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