

The ‘‘Old Northeastern’’ subspecies of Red Crossbill

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MAN HAS EFFECTUATED MASSIVE changes in the ecology of North America in the last 14,000 years, ranging from the accelerated extinction of many Pleistocene relict species, especially large mammals, to the present problems of chemical contamination of the environment such as acid rain. Habitat changes have often covered immense areas, for example, the invasion of woody vegetation into the desert grasslands of the southwest; the nearly 100% tillage of the midwestern tall-grass prairies; the planting of trees in that formerly treeless region; and the destruction of large tracts of eastern hardwood forests to open land for farming. Another profound change, pertinent to this study and more obvious 80 years ago than today, was the nearly complete obliteration by 1900 of the Eastern White Pine (*Pinus strobus*) forest as the dominant coniferous forest of the northeast from Massachusetts to Minnesota, and the simultaneous destruction of extensive regions of Eastern Hemlock (*Tsuga canadensis*) forests (Figs. 1, 2, 4–6, 10). E. A. Mearns (1890) wrote, describing the Hunter and Plateau Mountain region of the Catskills “. . . the barest tags and remnants remain of the splendid primeval forest that once covered this area . . .” Recovery of hardwood species and the moderate regeneration of hemlock and white pine, combined with reforestation, have now masked the original extent of forest destruction, and the concomitant but largely unrecorded shifts of wildlife populations that perforce must have occurred.

Red Crossbills (*Loxia curvirostra*) are found in coniferous forests throughout the northern hemisphere (Fig. 3). They vary geographically somewhat in color, but more in size, and especially in the relative size and massiveness of their bills (Fig. 7). Regional populations have become adapted to feed on the dominant conifers available to them in their core or central range, or, I suggest, perhaps more importantly in some cases, on the dominant conifer in their ‘‘escape

regions,’’ i.e. the regions into which they traditionally move in the event of cone failure within their core ranges. This is in part speculative, but let me illustrate using some examples.

L. c. minor, the smallest billed and indeed the smallest subspecies of all, has a core range that is restricted to the Pacific northwest, from Oregon to Alaska. It is adapted to feeding on the small cones of Douglas-fir (*Pseudotsuga menziesii*), Western Hemlock (*Tsuga het-*



Figure 1. Political cartoon of W.A. Rogers published in the New York Herald, April 29, 1903, indicating the devastating effects of timber practices (derisively called ‘‘the lumber grab’’) in the Adirondack Mountains, New York. Cartoon/New York State Museum.

erophylla), and Sitka Spruce (*Picea sitchensis*). During years of cone failure, it makes flights of from hundreds to thousands of miles searching for areas of abundant food. After locating such an area it may settle there for a partial season and possibly even nest. A massive invasion of *minor*, followed by nesting and then disappearance, was documented in the northeast in 1984–1985. In New York the small-billed *minor* utilized the small cones of the abundant Eastern Hemlock.

In contrast, *L. c. percna* is a large, dark-colored subspecies of Newfoundland and probably adjacent Labrador that has a big, heavy bill. This is obviously not an adaptation to the small-coned spruces and firs of its core range, but rather to the heavier cones of the Eastern White Pine of the northeastern United States and adjacent Canada, the region to which it “escapes” during years of spruce-fir cone failure. In former years it would have to compete with the medium-billed, white pine-adapted *L. c. neogaea* of the northeast,



Figure 2. Felling spruce in the Catskill Mountain area, New York, ca. 1905. Photo/ New York State Museum.

which I am calling, for convenience, the “Old Northeastern” subspecies. I suggest it was more important for *percna* to be super-efficient when it was surviving by invading *neogaea*’s core range,

even at the cost of being slightly less efficient with the more usually abundant spruce-fir cones of its core range.

I believe that one effect of the elimination of the Eastern White Pine biome and the simultaneous massive destruction of hemlock forests in the same region, was the near extinction of the “Old Northeastern” population of the Red Crossbill. This is documented in museum collections of bird specimens. Prior to 1911, the Red Crossbill must have been an abundant species in the northeast, and farther south, during irruptive periods. For example, the subspecies *neogaea* was described from a series of 70 specimens collected at Lake Umbagog, Maine, within a few days of early February 1886. Over 109 specimens of Red Crossbills, mostly *neogaea*, were collected between November 1887 and April 1888 in the vicinity of Washington, D.C. In 1906–1907, during the only major invasion of Florida, at least 28 specimens were collected. While these may represent the southern Appalachian population, they help dem-

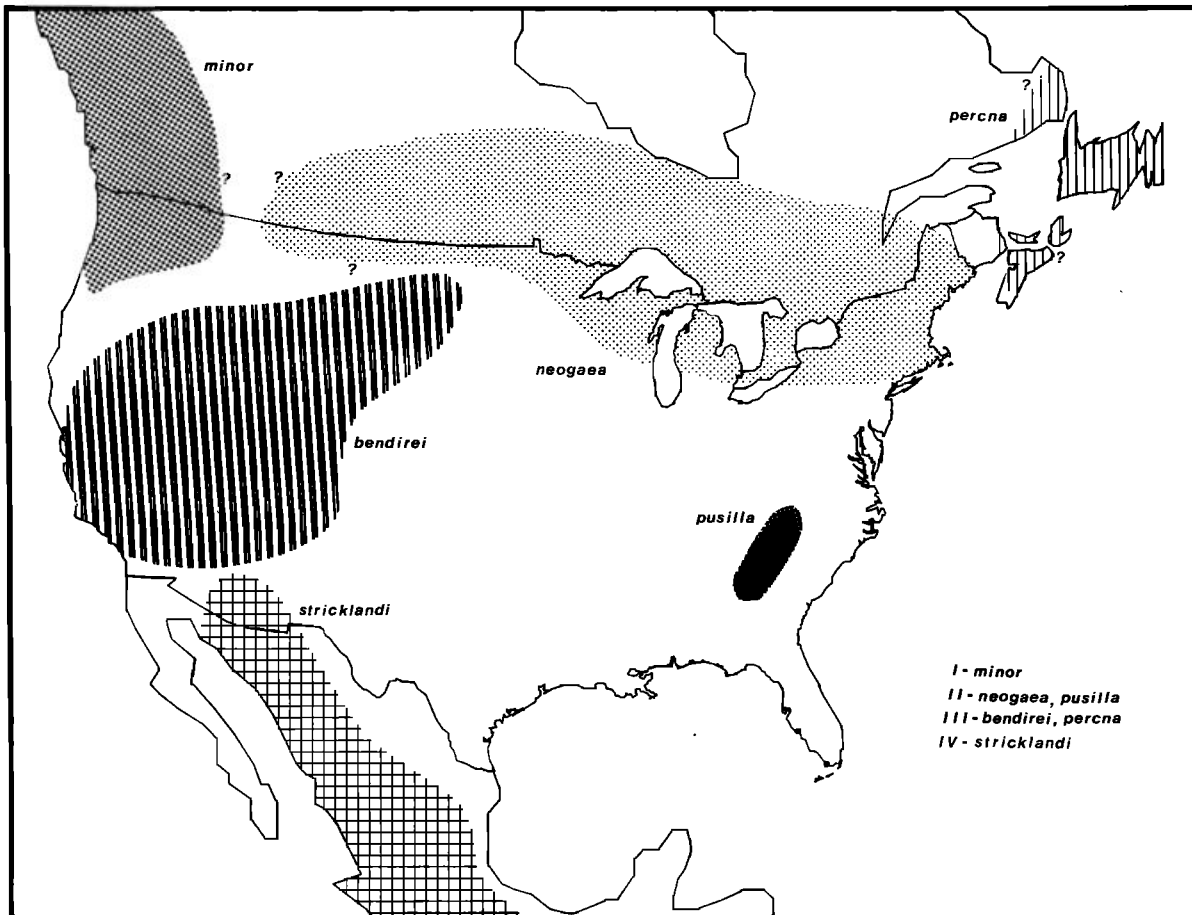


Figure 3. Distribution of core ranges of main Red Crossbill subspecies.



Figure 4. Pulpwood pile at Newton Falls, New York, ca. 1910. Photo/New York State Museum.



Figure 5. Charcoal kilns, Essex County, New York, ca. 1880. Photo/New York State Museum.



Figure 6. Drowned lands following forest destruction, Tupper Lake outlet, New York, ca. 1880. Photo/New York State Museum.

onstrate the former abundance of the populations of eastern North America. (See Dickerman 1986 and box on page 193 for a discussion of the systematics of the species in North America and for the use of the subspecific name *neogaea*.)

In the late 1950s, I was convinced that although there were series of specimens of Red Crossbills from the northeast in all collections (Griscom 1937, wrote that he studied 2447 specimens of the species), there were essentially none of the "Old Northeastern" subspecies collected since 1905–1910!

To demonstrate that this gap is real, and that it occurs from collection to collection, I recorded the specimens of *neogaea* in several collections by the year they were taken (Table 1). I recorded as *neogaea* specimens from within the core range of *neogaea* (Fig. 3; also Griscom 1937; also Dickerman 1986) that were identified as *neogaea* by myself or Phillips, or as *bendirei* by Phillips prior to 1975 (see Phillips 1981 for an explanation of his use of these names). I also included specimens labeled "SE" (southeast) by Phillips from within the core range. The rather high numbers of *neogaea* recorded from Minnesota (Table 1) includes specimens intermediate between the abundant invading western subspecies *bendirei* and *neogaea*, and no doubt some small specimens of *bendirei* were included in the *neogaea* column to be conservative. Most of those specimens were taken during large invasion years of *bendirei*. With the *neogaea* sample thus diluted, the reversal in ratios between *neogaea* and invading populations during the periods before and after 1911 is even more dramatic than indicated in Table 1.

Alternate explanations might be suggested for this change in *neogaea* abundance. During that same period, there was a sharp decrease in the number of nonscientific collectors with private collections of birds as conservation laws began to be developed. There was also a decrease in the number of scientific collectors as specimen-oriented ornithology became unpopular. However collecting did not cease entirely during the period.

The White-winged Crossbill (*Loxia leucoptera*) nests in spruce forests that were less affected by the lumbering blitz of the late 19th and early 20th centuries. For the period 1912–1960 for example, the White-winged Crossbill is represented in the Cornell University Collec-

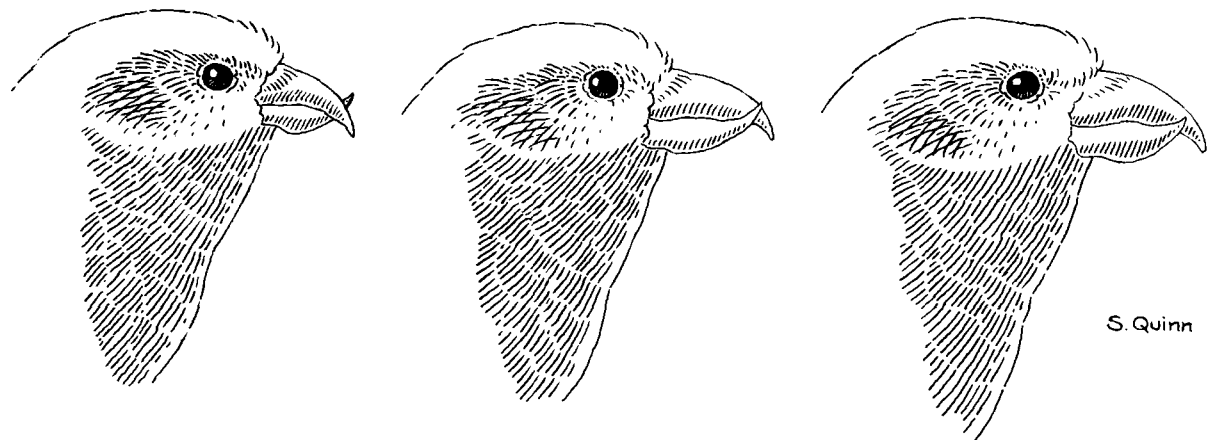


Figure 7. Differing sizes and shapes of Red Crossbill subspecies. Left to right: *L.c. minor*, AMNH # 816425, Essex County, New York, March 16, 1985; *L.c. neogaea*, AMNH # 29800, Lake Umbagog, Maine, February 9, 1886; *L.c. percna*, AMNH # 761750, Newfoundland, July 20, 1912. Drawing/Steve Quinn.

Table 1. Numbers of specimens of the “Old Northeastern” subspecies of Red Crossbill (*Loxia curvirostra neogaea*) from within the core-range ascribed by Griscom (1937), but including all of the New England states, in selected collections, by year specimens were collected, and totals of numbers of specimens of subspecies other than *neogaea* from the same area in four collections (AMNH, USNM, CU, MMNH).

	Collections						Total <i>neogaea</i>	Total non- <i>neogaea</i>
	AMNH	NYSM	USNM	CM	CU	MMNH		
Before 1886	12	3	11	1	2	8	37	11
1886–1890	33	6	11	2	4	2	58	14
1891–1905	28	12	1	25	5	3	74 ^a	2
1906–1911	8		9	1	2		20	11
Totals	81	21	32	29	13	7	189^a	38
1912–1950			1 ^b	3 ^c	1	6	11	15
1951–1960						13 ^d	13	66
1961–1970		2			4	9 ^d	15	43
1971–1980	4					4 ^d	8	36
1981–1985	1						1	32
Totals	5	2	1	3	5	32	48^d	192

^a Excludes 22 additional New York specimens collected prior to 1900 in the Rochester Museum and Science Center (9); A. G. Paine-A. H. B. Jordan Collection, Willsboro (7); Hobart and William Smith Colleges Collection (3); Roosevelt Wildlife Collection, State University, Syracuse (3, wings over 85 mm).

^b 1913 Wisconsin (2), 1940 Pennsylvania (1).

^c 1954, Buffalo Museum of Science.

^d Some of the males collected during invasions of *bendirei* into Minnesota, that are included here, probably represent small specimens of that western subspecies.

Museum abbreviations: AMNH—American Museum of Natural History (New York); NYSM—New York State Museum (Albany); USNM—U.S. National Museum of Natural History (Washington); CM—Carnegie Museum of Natural History (Pittsburgh); CU—Cornell University Collection (Ithaca); MMNH—James Ford Bell Museum of Natural History (Minneapolis).

tion by specimens taken in 1916, 1920, 1923, 1939, 1942, 1947, 1949, 1950 and 1951, yet *neogaea* is represented by only a single specimen from this time period.

The Red Crossbill is not a species in which one can selectively collect desired subspecies, and during the post-1911 period, specimens of the species were preserved from within the nesting range of *neogaea* during major flights of the highly irruptive subspecies *minor* from the Pacific northwest in 1913–1914, 1920–1921, 1925–1926, and 1928 (Griscom 1937). In New York, major flights were documented by specimens in 1913, 1923, 1941, 1951, 1953, 1954, 1955, 1961, 1973–1974 and in 1984–1985. Undoubtedly, earlier specimens were obtained by shooting, while the bulk of the material from the latter years were specimens salvaged from road-kills. However, collecting was probably at random as the subspecies are not distinct in the field, and one must explain the absence of comparable records for the local subspecies *neogaea*.

For Table I, I counted only specimens of *neogaea* from within the core-range, except for the extension into the southern Appalachians. The southern population probably is biologically distinct from the “Old Northeastern” subspecies. Although the numbers of specimens available are not large, the collecting dates are scattered throughout the years.

I feel certain that the extended movements of the eastern populations during the decades before and after the turn of the century must have been caused by the loss of the northern coniferous for-

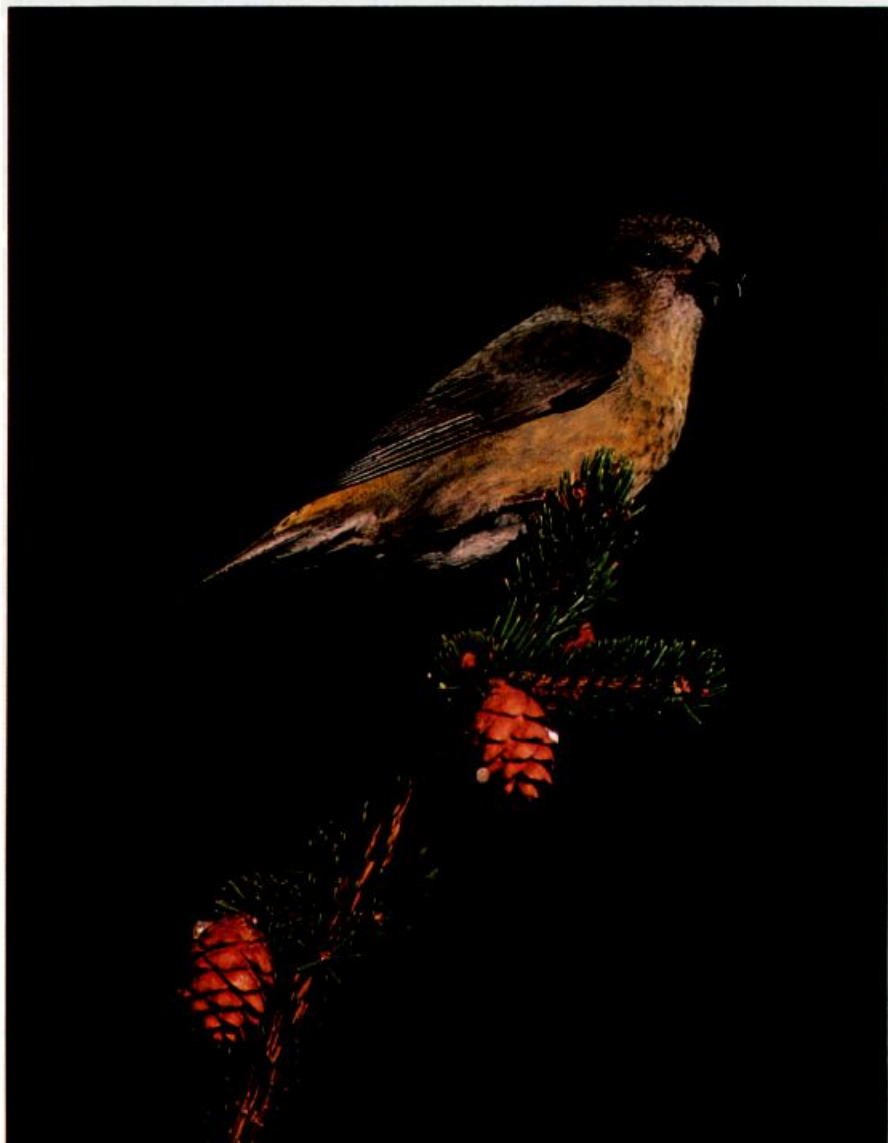


Figure 8. Female Red Crossbill (*L.c. minor*) taken in Hamilton County, New York, during February 1985. Photo/Brian M. Henry.

OWING TO THEIR highly irruptive nature, the taxonomic and distributional information on subspecies of the Red Crossbill is extremely confusing. A. J. Van Rossem's study of the Red Crossbill types, published in 1934, included two subspecies, *Loxia pusilla* and *L. minor*. Unaware that the Newfoundland and the southern Appalachian populations were distinct, Van Rossem identified “the larger Crossbill of eastern North America” *pusilla* instead of correctly using *percna*. This established an erroneous precedent that continued into the 1960s.

Van Rossem's study was followed in 1937 by Griscom's monograph on North American populations. Griscom correctly identified the smallest of the subspecies, the population of the Pacific coastal region, as *minor*. This name had been previously used to identify the northeastern population, so Griscom renamed this subspecies *neogaea*. Unfortunately, Griscom then went on to misidentify and confuse the other Red Crossbill subspecies. This error was compounded as other scientists and researchers used his work as a reference for their own research.

In preparing the fifth edition of the *AOU Checklist* (1957), the American Ornithologists' Union Classification and Nomenclature Committee accepted Griscom's erroneous classifications and dismissed his correct identification of *minor* and *neogaea*!

Currently, four types of Red Crossbills have been classified by A. R. Phillips (1981), according to size, as follows:

CLASS I (smallest)—*minor*, formerly known as *sitkensis*, (northwest Pacific coast population)
raei (Dismal Lake, Shoshone County, Idaho, population)

CLASS II (small)—*neogaea*, formerly known as *minor*, (northeastern population)
pusilla, formerly known as *bendirei*, (southern Appalachian population)
viduor (El Paso County, Colorado, population)

CLASS III (large)—*bendirei*, formerly known as *benti* and *grinelli*, (California population)
percna, formerly known as *pusilla*, (Newfoundland population)

CLASS IV (largest)—*stricklandi*, (Mexican population)

(Summarized from the *Kingbird* XXXVI(2)73–78).

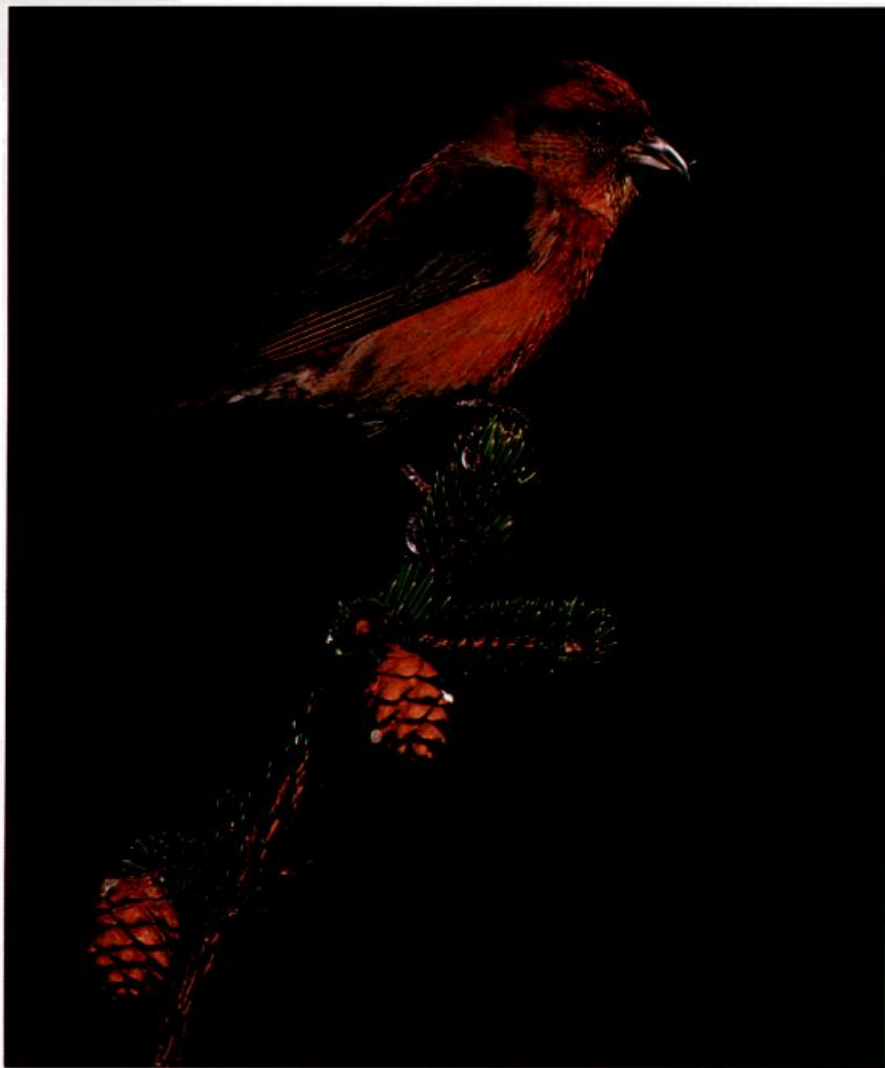


Figure 9. Male Red Crossbill, Hamilton County, New York, February 1985. Photo/Brian M. Henry.



Figure 10. Turn-of-the-century lumbering slash through the previously beautiful Blue Mountain Trail, Adirondack Mountains, New York. Photo courtesy NYSM.

ests. Extended erratic movements of the eastern populations have not been documented since about 1912. The slight increase in the numbers of *neogaea* among what I believe are randomly preserved crossbill specimens of *neogaea* in the last 20 years may well indicate the maturing of sufficient areas of Eastern White Pine and hemlock in the northeast to provide sufficient resources for a gradually increasing population of the subspecies.

The near extinction of the "Old Northeastern" subspecies of the Red Crossbill I believe is unique at least in North America. Most populations that have become extinct, or are on the fringe of extinction, were extreme specialists, either in food resources or some other aspect of their biology, or lived in restricted niches and/or ranges. I exclude of course the excessively hunted species such as the Heath Hen (*Cupido cupido*), Passenger Pigeon (*Ectopistes migratorius*), and Whooping Crane (*Grus americana*), although in fact they also fit those criteria. The Red Crossbill is indeed a specialist, and each regionally adapted subspecies is further specialized; however, most subspecies have large core ranges. Thus the utter destruction, within a few decades, of tens of millions of square miles of Eastern White Pine forests, and the concomitant elimination of such a widespread and abundant population of even a specialist, is difficult to conceive today.

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