

Northern Cardinal

Cardinalis cardinalis

With its loud, emphatic spring song and the male's bright scarlet color, the Northern Cardinal has become a well-known addition to Vermont's avifauna. It was rare in northern New England until the middle of the twentieth century, and the species did not breed much farther north than New Jersey prior to the 1900s. The first Massachusetts breeding record was either in 1958 (Boyd 1962) or 1961 (Veit and Petersen 1993); Vermont's first record was in 1962 (Pilcher 1985). The northward range shift has continued since then: the Northern Cardinal now breeds as far north as southern Canada, and west from the Atlantic Coast to the Great Plains.

The Northern Cardinal is a year-round resident in Vermont (Murin and Pfeiffer 2002), but individuals are less common during the winter months, indicating that some southward migration may occur. Courtship begins in March, when both sexes begin to sing their loud, ringing songs on warmer, clear days. Females usually sing more quietly than males, often with the objective of communicating with a male rather than advertising territory (Halkin and Linville 1999). Breeding habitats are typically shrubby, overgrown woodland edges and shelterbelts, or urban and suburban yards. The female builds the cup-shaped nest, usually in a dense bush, where she lays a clutch of up to 5 eggs. Atlasers found nests with eggs from 10 May to 24 July ($N = 15$), but nests with young were found as early as 3 May, indicating that nests may be initiated as early as mid-April. The female incubates the clutch for about 12 days, and the young leave the nest when they are about 12 days old. Cardinals are double- and sometimes triple-brooded, and one nest with young was found exceptionally late in the Champlain Valley, on 13 September.

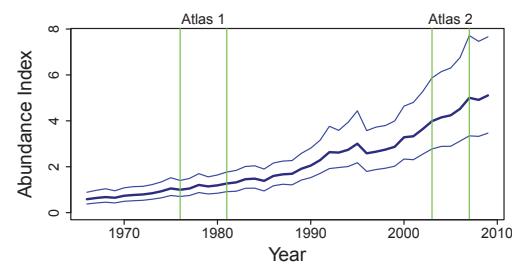
During the first atlas, the Northern Cardinal was widespread in the Champlain Valley and the Southern Vermont Piedmont, the parts of the state that were first colonized by the species (Pilcher 1985); it was uncommon in northeastern Vermont. Pilcher (1985) remarked that this species had increased "dramatically" in the previous twenty years. The second atlas revealed another

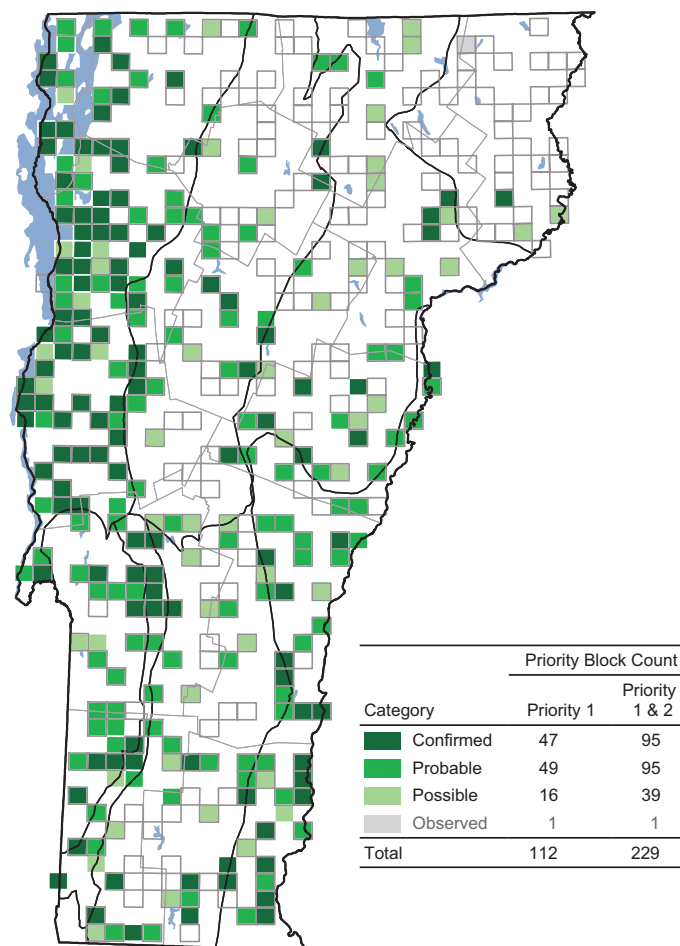
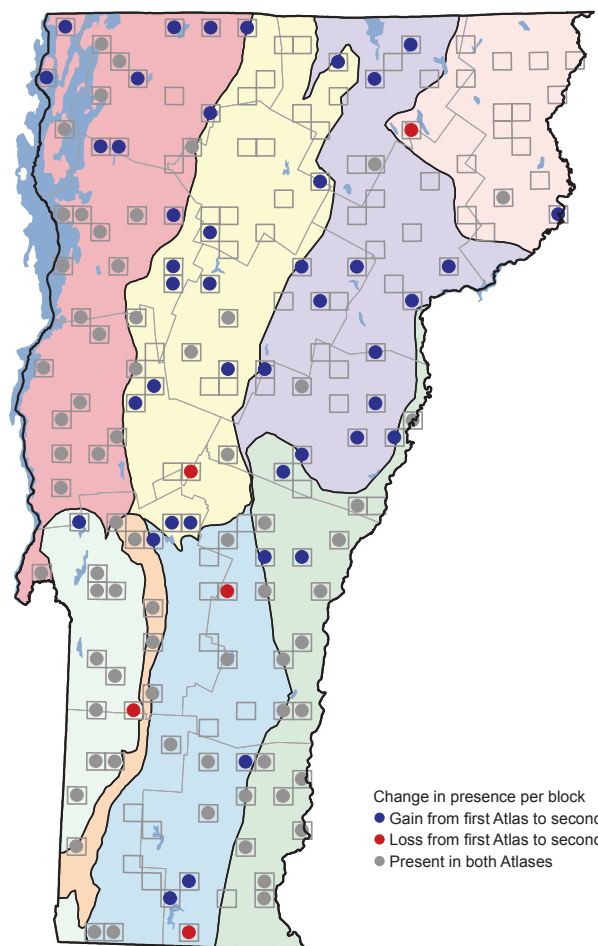


twenty-five years of the same trend, and Northern Cardinals are now widespread in lower-elevation habitats from the southern border to the northernmost parts of Lake Champlain. The most marked increases occurred in the Northern Green Mountains and the Northern Vermont Piedmont, with less dramatic increases in the Champlain Valley and the Southern Vermont Piedmont. This may indicate that the species is approaching "saturation" in lower-elevation areas and is now spreading to higher elevations. The northward range extension in New England is mirrored by a similar trend across the northern perimeter of the species' breeding range west to Wisconsin and Minnesota (Sauer et al. 2011). The second Pennsylvania atlas recorded a 5 percent increase in the numbers of blocks occupied by this species (Wilson et al. 2012), while the second Ontario and New York atlases both found that it had extended its range significantly northward (Cadman et al. 2007, McGowan and Corwin 2008).

Halkin and Linville (1999) suggested that the spread of winter feeding stations and a warming climate have contributed to the rapid range expansion of the Northern Cardinal. Both factors may be operating in Vermont, but it would be difficult to tease apart their respective effects.

RELATIVE ABUNDANCE OVER TIME





CHANGE IN DISTRIBUTION BETWEEN ATLASES

Biophysical Region	First Atlas	Second Atlas	Change	% Change
Champlain Valley	21	31	+ 10	+ 48
Northeastern Highlands	2	2	+ 0	+ 0
Northern Green Mountains	6	16	+ 10	+ 167
Northern Vermont Piedmont	2	15	+ 13	+ 650
Southern Green Mountains	13	15	+ 2	+ 15
Southern Vermont Piedmont	15	18	+ 3	+ 20
Taconic Mountains	10	10	+ 0	+ 0
Vermont Valley	5	5	+ 0	+ 0
Totals	74	112	+ 38	+ 51

DISTRIBUTION IN CURRENT ATLAS

Biophysical Region	% of region species occupies	% of all records for this species found in region
Champlain Valley	90	29
Northeastern Highlands	8	1
Northern Green Mountains	46	13
Northern Vermont Piedmont	50	14
Southern Green Mountains	62	15
Southern Vermont Piedmont	87	15
Taconic Mountains	90	8
Vermont Valley	100	3

An increase in the availability of edge habitat, which Halkin and Linville (1999) also suggested as a reason for the bird's spread northward, is a less likely factor in Vermont, as the state has been undergoing reforestation. It is possible that Vermont's continued suburbanization also has benefited this species, as areas that were previously forest or farmland have been converted to the shrubby artificial habitats favored for breeding.

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