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Fishers, Farms, and Forests in Eastern North America

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Abstract The fisher (*Martes pennanti*) has recently recovered from historic extirpations across much of its geographic range. There are at least five explanations for the recovery of the fisher, including changes in the amount of habitat, the suitability of habitat, trapping pressure, societal attitudes toward predators, and climate. We evaluated a recovering fisher population in Ontario to test two conditions we viewed as necessary to support the hypothesis that fisher populations have increased due to an increase in the amount of forested land. First, we tested whether the amount of forested land has increased. Second, we tested whether contemporary fisher abundance (and therefore habitat quality) was related to the amount of forest. Topographic maps showed that the proportion of forested land in the study area had increased by 1.9% per decade since 1934 and 3.3% per decade since 1959, likely as a result of land conversion from agricultural uses. Overall the proportion of the study area that was forested increased from 29% to 40% during 1934 to 1995. Census data from the region indicated that there had been a decline in the amount of land area being farmed during the last 50 years. Recent livetrapping data showed that fisher abundance was positively related to the proportion of landscapes that were forested. Based on our results, we could not reject the hypothesis that an increase in the amount of forested land has contributed to the recovery of fisher populations.

Keywords Agriculture · Defragmentation · Fisher · Fur harvest · Habitat · Landscape change · *Martes pennanti* · Threshold

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Introduction

Alterations to natural landscapes from processes such as urbanization and agricultural land use, can result for some species in habitat loss and fragmentation (Andrén 1994; Fahrig 2001). These changes have the potential to reduce population sizes for some species and can eventually result in extirpation (Fahrig 2001).

The opposite situation should occur where human modification of landscapes ebbs and natural habitats are restored. In much of eastern North America, agriculture has long been a dominant land use. Many jurisdictions, however, appear to be facing declines in agriculture that can be linked to shifting social and economic conditions (Moss and Davis 1994; Brown and others 2005). Increases in forested land may result from reduced farming intensity, and this could begin to reverse some negative ecological effects caused by historic patterns of human land use.

One species that was extirpated from much of its historic range by anthropogenic effects is the fisher (*Martes pennanti*) (Rand 1944; de Vos 1951). The fisher was extirpated during the 1920s and 1930s, likely as a result of habitat loss or alteration, intensive fur trapping, and, possibly, incidental poisoning from predator control efforts (de Vos 1951; Aubry and Lewis 2003). These mustelids prefer forests with dense canopy cover, large diameter trees, and a mixture of coniferous and deciduous trees (Thomasma and others 1991). Habitat selection appears to be governed largely by food availability, access to areas with continuous overhead cover, and availability of denning sites in tree cavities (Douglas and Strickland 1987; Buskirk and Powell 1994; Paragi and others 1996). In the Canadian province of Ontario, the situation remains that no fishers are caught by trappers in fur management units where the proportion of forest cover is <40%, suggesting that the species is absent from these areas (Fig. 1).

Fur harvest data illustrate the recent recovery of the fisher within historic range in Ontario. Ontario Ministry of Natural Resources (OMNR) records indicate that there were no fishers trapped in the eastern Ontario fur management units of Brockville and Cornwall for several decades prior to the early 1990s (Fig. 2), although fishers had occurred in the area prior to European settlement (Gibilisco 1994). Since the 1990s, the annual harvest of fishers in these units has rapidly increased, whereas harvest has been more consistent in predominantly forested management units farther north, such as North Bay (Fig. 2). The trends in these harvest data are supported by abundance data showing an increase in fishers in eastern Ontario since 1995 (Bowman and others 2006). Many other jurisdictions in eastern North America have experienced similar fisher population recoveries (e.g., Batcheller 2001). Understanding the cause of these recoveries in eastern North America has particular importance given the species' perilous status in many jurisdictions of western North America (United States Fish and Wildlife Service 2004).

Possible causes of the fisher recovery include (1) an increase in the amount of forested land caused by a reduction in agriculture; (2) an increase in the suitability of forested land; (3) decreased incidental trapping pressure during the 1980s and 1990s as a result of the reduced value of fur; (4) a change in social attitudes toward predators and consequent reduction in predator control efforts; and (5) climate change. Our objectives were related to the first possibility, that fisher abundance in eastern Ontario has increased due to an increase in the amount of forested land. This hypothesis is not exclusive of the others. It does, however, suggest two necessary conditions. First, an increase in the amount of forested land should have started in an area prior to the recovery of its fisher population. Second, there should be a positive association between contemporary estimates of fisher abundance and the amount of forest in landscapes, indicating that forested land represents high-quality habitat for fishers. If these two conditions are not met, then hypothesis 1 can be rejected. Our approach was to test for these conditions in a part of eastern Ontario, where fishers appear to have recolonized the landscape beginning in the 1990s. We evaluated topographic maps produced during 1934 to 1995 to test for historical changes in the amount of forest. We used census data to investigate the related prediction that there has been a reduction in the extent of agricultural land uses in the region. We then used 5 years of livetrapping data to evaluate the contemporary relationship between fisher abundance and the amount of forest in landscapes.

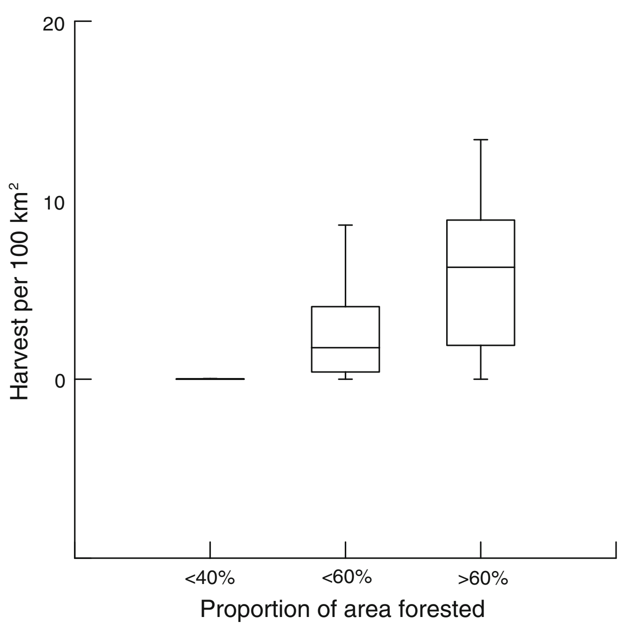

Fig. 1 Fisher (*Martes pennanti*) harvest density compared to forest cover in Ontario Ministry of Natural Resources fur management units in the Southern Region of Ontario during the harvest year 2004–2005. Forest cover in each unit was estimated from classified 1996 Landsat imagery. For descriptive purposes, units were sorted into those with <40% ($n = 3$), 40%–60% ($n = 9$), or >60% ($n = 11$) forest cover

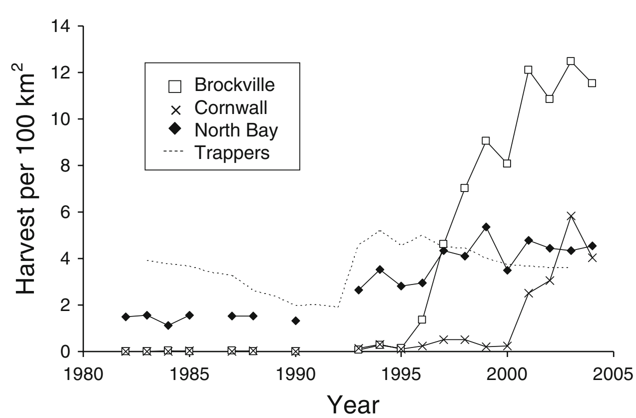

Fig. 2 Number of fishers (*Martes pennanti*) harvested per 100 km^2 (1982–2005) in the Ontario Ministry of Natural Resources (OMNR) fur management units of Brockville, Cornwall, and North Bay. Brockville and Cornwall units are both within the Kemptville District of OMNR, and the number of trappers per year ($\times 10^2$) in Kemptville is depicted by the dashed line

Methods

Study Area

Forest and land use changes were examined in a predominantly agricultural, 4600-km^2 area of eastern Ontario (Fig. 3). Dominant tree species in the area included sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), basswood (*Tilia americana*), red maple (*Acer rubrum*), and white ash (*Fraxinus americana*) (Keddy 1994). Common conifer species included white pine (*Pinus strobus*), white spruce (*Picea glauca*), hemlock (*Tsuga canadensis*), eastern white cedar (*Thuja occidentalis*), and balsam fir (*Abies balsamea*) (Keddy 1994). Prior to European settlement, the area was heavily forested. Once settlement began in the early 1800s, however, forests were cleared for agricultural land use and roads were constructed. Trees in the region also were cut to create ash for producing potash, and logging for pine was an important industry (Keddy 1994).

We carried out our research in this eastern Ontario area because harvest data (Fig. 2), anecdotal observations during the late 1990s, and a subsequent telemetry study (Koen 2006) suggested that the area was recently recolonized by fishers and had very high fisher densities (Koen and others 2007). For the present study, we compiled data from three disparate sources. First, we used National Topographic Survey (NTS) map sheets (Appendix, Table A1) to reconstruct historical changes in forest cover. Five map sheets (Brockville, Merrickville, Morrisburg, Winchester, and Kemptville) were selected because, collectively, they encompassed Koen's (2006) fisher telemetry study area (Fig. 3) and they were thought to capture the range of variation in agriculture in the region. Second, we assessed agricultural trends using data from the Statistics Canada Census of Agriculture for two adjacent census divisions that also encompassed this eastern Ontario area of interest (Leeds and Grenville division and Stormont, Dundas, and Glengarry division; Fig. 3). Finally, we used data from the OMNR rabies livetrapping program to assess contemporary relationships between fishers and forest. These data were mostly within the Leeds and Grenville census division (Fig. 3). Of necessity, our three data sources were not completely overlapping, as the boundaries conformed to different geopolitical units. None of our analyses required, however, that these data sources overlap, since each source was used in a stand-alone analysis. We consider the aggregate results to be indicative of regional trends, since each data source was large and heterogeneous.

Historical Trends in Forested Land

Historical trends in forested land were assessed using 1:50,000 scale maps from the NTS (Fig. 3). We measured forest for each sheet beginning with second edition maps from the 1930s to the most recent edition (1995) (each year that the cartographic information was updated with aerial

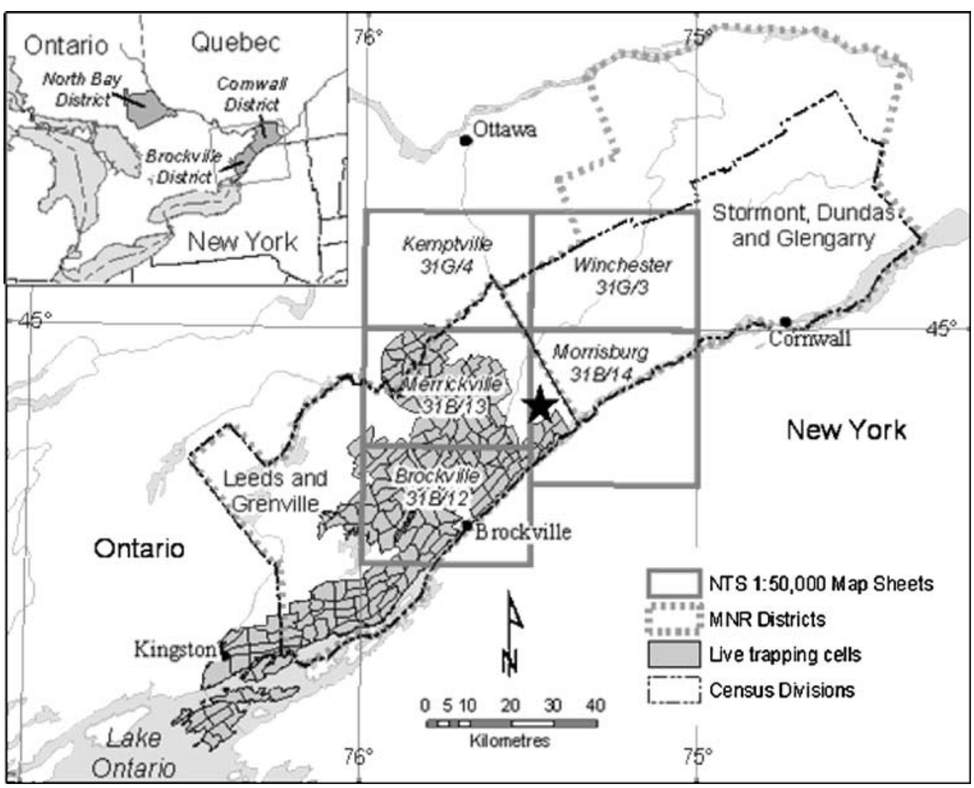

Fig. 3 Location of the study area in Ontario, Canada, where change in the proportion of forested land during 1932 to 1995 was measured. Forest change was measured over five topographic map sheets: Kemptville, Merrickville, Brockville, Winchester, and Morrisburg. Agricultural census data used in the study were aggregated over two census divisions (Leeds and Grenville, and Stormont, Dundas, and Glengarry). Fisher abundance was assessed over 77 live-trapping cells, each about 12 km^2 in size. Fur harvest data were reported from Brockville, Cornwall, and North Bay districts (inset). The location of a fisher telemetry study (Koen 2006) is depicted by the star. The copyright of all topographic maps used in this study is held by Her Majesty the Queen in Right of Canada for the year of publication

photography). Paper maps were used, with the exception of the most recent versions, which were digital. We sampled intersections of the 1-km Universal Transverse Mercator (UTM) gridlines, and at each intersection, we made a binary decision about whether or not forested land was present. Forested land was identified by the cartographic definition. Only "heavy" wooded land, defined as an area at least 35% covered by perennial vegetation with a minimum height of 2 m (Natural Resources Canada 2001), was identified as forest. Sample points on the American side of the Canadian border were discarded (Fig. 3). The entire study area consisted of 4614 sample points, and repeated samples of these points through time yielded a total of 23,682 points.

The proportion of forested land for each map was estimated by dividing the number of identified forest points by the total number of UTM gridline intersections. While the difference in proportions of forested land at various points in time conveyed net changes, it did not fully clarify the dynamics of the process of land use change. For example, in a case of no net change in the amount of forested land, there could still be substantial gain in forest in parts of the study area and an equivalent loss of forest elsewhere in the area. To assess these dynamics, the transitions for each point were tabulated by map at every time interval. The four possible transitions that could occur at a point were (1) a forested point remains forested, (2) nonforested becomes forested, (3) forested becomes nonforested, and (4) nonforested remains nonforested.

Agricultural Land Use

Agricultural land use data were obtained for 10-year intervals during 1951 to 2001 from the Statistics Canada Census of Agriculture (Dominion Bureau of Statistics 1953, 1963; Statistics Canada 1973, 1982, 1992, 2001). Census information was bound to reporting districts; therefore, data regarding agricultural land use were collected from the (1) Leeds and Grenville and (2) Stormont, Glengarry, and Dundas census divisions, which encompassed the area of interest in eastern Ontario (Fig. 3). Reported statistics were compiled into four categories: total number of farms reporting, total farm hectares in the reporting district, area of improved land, and area of unimproved land. Unimproved land included woodlots, bogs, and marshes, and provided an index of the proportion of farms that were natural habitats. We tabulated data to assess changes in the total number of farms, the average size of farms, the total area of farmed land, and the area of unimproved land on farms.

Data also were collected from the census on the human population classified as rural farm and rural nonfarm, and tabulated for the same years and divisions.

Contemporary Relationship Between Fishers and Forest

The OMNR carries out an annual live-trapping program in eastern Ontario to vaccinate rabies vectors (Fig. 3) (Rosatte and others 2001). A 925-km^2 area was divided into 77 cells, each approximately 12 km^2. Cells were live-trapped annually during June to October. Although fishers are not considered rabies vectors, many have been captured each year in this program. For details on the live trapping methods and temporal fisher abundance trends see Bowman and others (2006). All animal handling procedures were approved by the OMNR Animal Care Committee. We used 5 years of data from this program (1998 to 2002 inclusive) encompassing the recent population peak. We considered the number of fisher captures per year in each cell as an estimate of abundance since effort was standardized per cell each year. These annual indices were combined in an average to estimate the overall abundance of fishers per cell. Fishers appear to exhibit some density-dependent dispersal, which could lead to a decoupling of abundance and habitat quality (Carr and others 2007). Since we used an abundance measure pooled over years and aggregated at a coarse scale, we expected that potential sink effects would have been obscured. In other words, we expected a positive relationship with our fisher population index and habitat quality.

We assessed the proportion of each cell that was forested using recent (2000–2002) digitized aerial photographs (Ontario Ministry of Natural Resources, unpublished data) identifying forest (including hedgerows) and nonforest areas. Forest was defined as treed areas >2 m in height and >0.25 ha in extent with >60% canopy cover.

Statistical Analysis

A linear regression was used to assess the historical change in total forested land from 1934 to 1995, using year as an independent variable along with binary dummy variables to control for differences in the proportion of forest on different map sheets at the start of the time series. The Kemptville map sheet was randomly selected as the map sheet to be omitted from this analysis, since exclusion of one map was necessary to avoid a singular matrix. An objective of this regression was to use the parameters to estimate the annual rate of change in the amount of forested land. This assumed a linear change during the study period.

Agricultural land use and human population were census data (i.e., not samples) and therefore their trends were qualitatively described.

Before assessing the contemporary relationship between fisher abundance and forested land, we tested the average fisher abundance in trapping cells during 1998 to 2002 for spatial structure using a correlogram and found none. We then used a linear regression, expecting that there should be a positive relationship between fisher abundance and the proportion of forest in the cells.

Results

Forested land increased during 1934 to 1995 at a rate of 1.9% per decade ($F_{5,20} = 50.22$, $p < 0.0001$, $R^2 = 0.93$) (Fig. 4, Table 1). Overall, the proportion of the map sheets that was forested increased from 29% (estimate for 1934 to 1948 inclusive) to 40% (1994 to 1995). The increase was similar across each of the five different map sheets. Merrickville had the greatest proportion of forest, whereas Winchester and Morrisburg had the least forest. The lack of a significant regression coefficient for the Brockville map sheet demonstrated that the amount of forest in Brockville did not differ from the amount in the dummy variable Kemptville (Table 1). We carried out a second analysis omitting Brockville and there was no difference in any of the coefficients, so we report only the analysis with Brockville included.

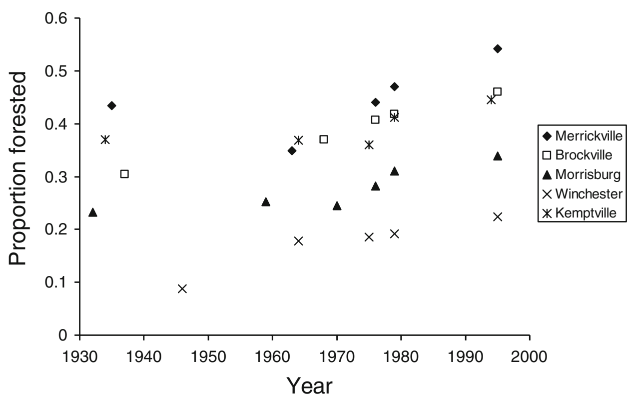

Fig. 4 Proportion of forested land in a study area in eastern Ontario, Canada, during 1932 to 1995, measured on five different topographic map sheets

Table 1 Regression coefficients for relationship between percentage of forest cover on topographic map sheets and year

	Coefficient	SE	Probability
Intercept 1934	−3.4039	0.6761	0.0001
Year 1934	0.0019	0.0003	<0.0001
Merrickville 1934	0.0553	0.0211	0.0165
Brockville 1934	−0.0025	0.0211	0.9059
Morrisburg 1934	−0.1127	0.0202	<0.0001
Winchester 1934	−0.2224	0.0212	<0.0001
Intercept 1959	−6.0502	0.9346	<0.0001
Year 1959	0.0033	0.0005	<0.0001
Merrickville 1959	0.0532	0.0169	0.0066
Brockville 1959	0.0125	0.0169	0.4705
Morrisburg 1959	−0.1034	0.0161	<0.0001
Winchester 1959	−0.2023	0.0169	<0.0001

Note. Two separate regressions were carried out, for 1934 to 1995 and 1959 to 1995. In both regressions, a binary dummy variable was used to code for four different map sheets to control for variance due to different amounts of forest across the study area. An additional map sheet (Kemptville) from the study area was not included as a dummy variable to avoid a singular matrix

The increase in forest appeared to be greatest after the 1950s, so we reanalyzed the data for the period 1959 to 1995 and found that forest had increased in each of the areas covered by the five map sheets by 3.3% per decade ($F_{5,15} = 73.16$, $p < 0.0001$, $R^2 = 0.96$). Once again, Merrickville had the greatest amount of forest, Winchester and Morrisburg had the least forest, and Brockville and Kemptville were equivalent (Table 1). Analysis of these data omitting Brockville demonstrated no difference in coefficients.

The land cover transition matrix indicated that, though forest increased overall, within any time interval an average of 4% of the study area (184 km^2) was converted from forest to nonforest (Fig. 5). On a map sheet basis, forest-to-nonforest transitions ranged between 1% (Winchester, 1979 to 1995) and 9% (Merrickville, 1976 to 1979), whereas nonforest-to-forest transitions ranged between 4% (Morrisburg, 1959 to 1970) and 15% (Merrickville, 1963 to 1976). The land cover dynamics on the eastern map sheets (Winchester and Morrisburg) were more unidirectional and stable, with lower rates of transition between forest and nonforest, than the western map sheets, where the transitions into and out of forest occurred at higher rates.

The total number of farms in the study area declined during 1951 to 2001 by an average of 19.2% per decade across both census divisions (Table 2). Although the total number of farms decreased, the average size of farms increased, and the proportion of unimproved land on farms decreased. Nevertheless, the total area of farmed land in the region declined. Accompanying this decline, the rural farm populations during 1951 to 2001 declined by an average of 25.0% across both counties. The rural nonfarm population grew, however, by 31.0% per decade in Leeds and Grenville and by 16.2% per decade in Stormont, Dundas, and Glengarry (Table 2).

During 1998 to 2002, a total of 288,974 trap nights (traps × nights) were carried out in the 77 trapping cells (mean = 750 trap nights per cell per year). The average catch success was 0.80 fisher per 1000 trap nights. There was a positive, linear relationship between the proportion of forest in trapping cells and the average number of fishers captured per cell over the 5 years ($F = 17.66$, $n = 77$, $p < 0.001$; Fig. 6).

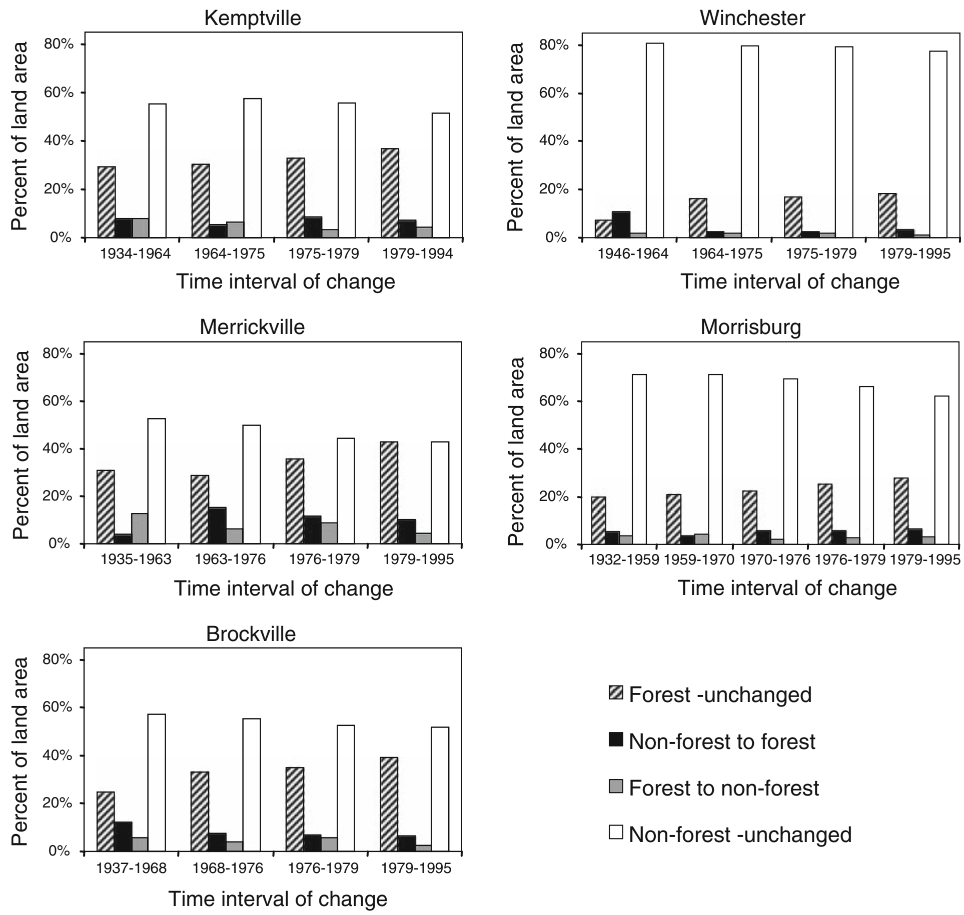

Fig. 5 Transitions of land cover between forest and nonforest in eastern Ontario, Canada, as measured from five different topographic map sheets at different time intervals

Table 2 Census data depicting trends during 1951 to 2001 in agriculture and human population attributes for Leeds and Grenville (L) and Stormont, Dundas, and Glengarry (S) United Counties in eastern Ontario

Year	Total no. of farms		Size of farms (ha)		Land farmed (% of total)		Land not Improved (% of farm)		Rural farm population (×1000)		Rural nonfarm population (×1000)	
	L	S	L	S	L	S	L	S	L	S	L	S
1951	3879	5702	68	51	75.0	88.8	51.4	33.2	17.5	25.8	14.7	21.0
1961	3080	4537	77	59	67.5	81.4	54.3	24.8	17.5	20.4	24.0	22.0
1971	2290	3316	86	70	58.3	70.0	51.1	34.9	9.1	14.3	30.0	26.5
1981	1854	2692	88	78	48.2	63.6	43.3	22.4	6.3	9.7	39.0	33.9
1991	1492	2203	93	87	41.0	57.8	48.0	24.6	4.7	7.4	49.0	40.7
2001	1348	1939	101	104	40.7	60.8	45.1	22.3	3.7	6.2	54.8	44.0

Discussion

The first necessary condition of the hypothesis that an increase in forested land has facilitated fishers is that forested land in the region started increasing prior to the fisher recovery. Our results demonstrate that during 1934 to 1995, this condition has been met. The amount of forested land increased during the period by 1.9% per decade (or 3.3% per decade since 1959). The proportion of the overall study area that was forested increased from 29% to 40% during 1934 to 1995. Agricultural census data suggest that this increase was likely the result of a transition of agricultural land into forests. Both the total number of farms and the total farm area declined in the study area during 1951 to 2001. At the same time, the average size of farms increased, and the amount of unimproved land on farms decreased. In concert, these census data suggest that the increase in forested land was not a result of changing farm practices but, rather, was a result of farm abandonment. A relatively larger number of small farm operators were replaced by fewer large operators, and the net effect of this turnover was fewer farms operating on less land. It is likely

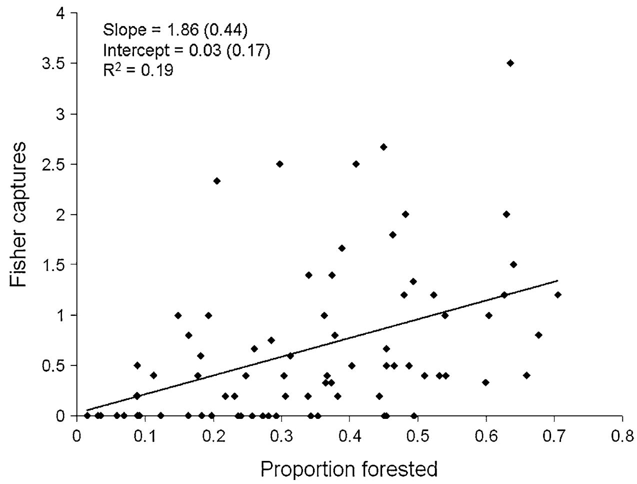

Fig. 6 The average number of fisher captures per year in 12-km^2 live-trapping cells in eastern Ontario, Canada ($n = 77$), compared to the proportion of forest in the cells. Trapping was carried out during June to October, 1998 to 2002 inclusive, and most, but not all, cells were trapped each year. Forest was assessed using digitized aerial photographs

that the least productive lands were being abandoned to succeed into meadows and woodlands.

Our results are consistent with some other areas in eastern North America that have seen an increase in forested land in recent decades, such as Wainfleet Township in southern Ontario (Moss and Davis 1994) and the St. Lawrence Valley in the Canadian province of Quebec (Bélanger and Grenier 2002). In rural Ohio, forests increased from 10% to 19% within a 50-year period (Medley and others 2003), and fragmentation declined as a result of forest patch coalescence (Medley and others 1995). Some areas in southern Ontario, however, such as the Niagara Region, have seen no change in the amount of forest in recent decades (Muller and Middleton 1994). Generally, it seems that there has been a widespread decline in the extensiveness of agriculture in eastern North America (Brown and others 2005). These reductions in farming likely have resulted in an increase in forests, except near cities, where the new land use has largely been urban and exurban development (e.g., Puric-Mladenovic and others 2000).

The eastern half of our study area (Winchester and Morrisburg map sheets) had lower rates of transition between forest and nonforest and less forested land than the western half. Our study area was bisected approximately along these lines by the Frontenac Axis portion of the Canadian Shield, where the western half of the study area was within the Shield. Lands within this geological formation are less suitable for agriculture than surrounding lands. We take the difference in transition rates and amount of forested land as evidence that marginal farm lands underwent more frequent land use changes.

The second necessary condition of the hypothesis that fisher populations have increased due to an increase in forested land is that contemporary fisher abundance is positively related to the amount of forest in landscapes. This appears to be the case in eastern Ontario, where more fishers were captured in trapping cells that had more forest. This finding is also consistent with previous research that has demonstrated selection by fishers for forested habitat both in Ontario (Koen 2006; Carr and others 2007) and elsewhere (Thomasma and others 1991, Weir and Harestad 2003). Our study is one of the few, however, that demonstrates a landscape-scale relationship between fisher abundance and forest (e.g., Carroll and others 1999).

Unlike the rather modest increase in the amount of forested land (3.3% per decade since 1959), fisher abundance increased rapidly during the 1990s in eastern Ontario (Fig. 2). It is not obvious that this rapid increase in fishers could be due to the increase in forested land, since the fisher increase was steeper than the forest increase. We think it noteworthy, however, that no fur management units in Ontario appear to have fishers where the proportion of forest in the unit is <40% (Fig. 1), and the proportion of forest in our study area increased to 40% by 1995. This suggests the possibility of a minimum habitat threshold (i.e., an "extinction threshold" [Fahrig 2001]) and a nonlinear response by fishers to habitat amount. Once sufficient habitat and resources exist, a population that recolonizes a landscape from which it was extirpated might be expected to increase very rapidly. Initial low densities and abundant, naïve food sources provide an opportunity for population growth approaching the intrinsic rate of increase (Caughley and Sinclair 1994). Despite this speculation, it remains an open question whether sufficient habitat for fishers has only been available recently due to the increase in forested land. Using the approach we have taken here, we were merely unable to reject the hypothesis that an increase in the amount of forested land has facilitated the fisher recovery.

Our results do not contribute to testing the four alternative explanations for the fisher population recovery: increased habitat suitability, reduced trapping pressure, reduced predator control, and increased climate suitability. These hypotheses are not exclusive of the potential effects of increased habitat area, and several of these processes may be correlated. For example, our method of measuring change in the amount of forested land did not provide any information on change in forest composition. In general, fishers are thought to prefer mature mixedwood forests (Thomasma and others 1991), and it might be expected that the habitat suitability of remnant woodlots in the study area has improved with time as stands have aged. Swihart and others (2003) modeled life history attributes of a number of species extirpated from Indiana, and concluded that human-caused mortality was a more plausible explanation than habitat change for the extirpation of fishers due to their wide niche breadth. We suggest that changes in trapping pressure and social attitudes regarding predator control should also be considered in future studies of fisher recovery and population persistence.

Conclusion

Our study demonstrated that fishers appear more abundant in landscapes with more forest, and that the amount of forested land has increased in eastern Ontario, whereas the amount of agricultural land has decreased during the last half-century. This change in land cover appears to have resulted from an abandonment of farms on less productive land rather than from a change in farming practices. The increase in forest has resulted in habitat gain for fishers, and may be at least partly responsible for the recent recovery of this forest-associated species in the region. We expect that other forest species also would benefit from these changing land use practices. Similarly, such increases in forest may be contributing to a decline in early successional species (e.g., Hunter and others 2001).

Acknowledgments This research was funded by the Wildlife Research and Development Section of the Ontario Ministry of Natural Resources and supported by the Internship in Conservation Biology program at Trent University. We appreciate the contributions of the Rabies Research and Development Unit of OMNR for providing livetrapping data.

Appendix

Table A1 Natural Resources Canada topographic map sheets (scale, 1:50,000) used to measure change in the amount of forested land in eastern Ontario

Map name	Sheet no.	Edition	Data year	Year published
Brockville, Ontario	31B12	Digital file 3.02	1995	1998
Brockville, Ontario	31B12	7	1979	1982
Brockville, Ontario	31B12	6	1976	1979
Brockville, Ontario	31B12	5	1968	1971
Brockville, Ontario	31B12	4	1937	1951
Merrickville, Ontario	31B13	Digital file 3.03	1995	2000
Merrickville, Ontario	31B13	5	1979	1982
Merrickville, Ontario	31B13	4	1976	1979
Merrickville, Ontario	31B13	3	1963	1969
Merrickville, Ontario	31B13	2	1935	1951
Morrisburg, Ontario	31B14	Digital file 3.02	1995	2000
Morrisburg, Ontario	31B14	8	1979	1982
Morrisburg, Ontario	31B14	7	1976	1978
Morrisburg, Ontario	31B14	5	1959	1963
Morrisburg, Ontario	31B14	3	1939	1951
Winchester, Ontario	31G03	Digital file 3.02	1995	1999
Winchester, Ontario	31G03	5	1979	1982
Winchester, Ontario	31G03	4	1975	1976
Winchester, Ontario	31G03	3	1964	1968
Winchester, Ontario	31G03	2	1946	1951
Kemptville, Ontario	31G04	Digital file 3.05	1994	2001
Kemptville, Ontario	31G04	7	1979	1979
Kemptville, Ontario	31G04	6	1975	1975
Kemptville, Ontario	31G04	5	1964	1969
Kemptville, Ontario	31G04	3	1934	1951

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