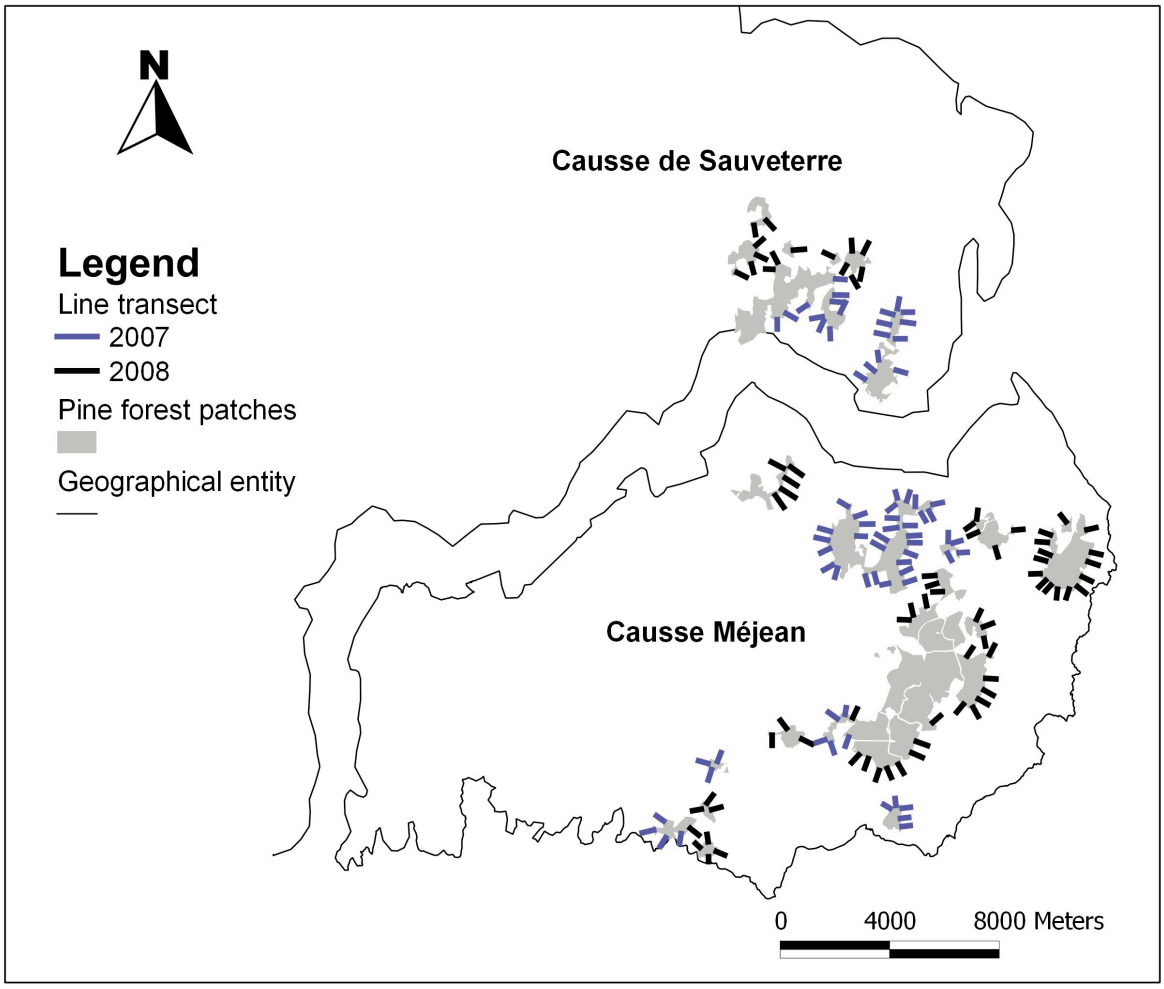
Oikos

o20308

Fonderflick, J., Besnard, A. and Martin, J.-L. 2012. Species traits and the response of open-habitat species to forest edge in landscape mosaics. – Oikos 122: 42-51.

Appendix A1

Localisation of the 153 transects surveyed in 2007 and 2008 adjacent to pine forest patches distributed in the study area.



Appendix A2

Environmental variables selected to describe the habitat within and around each transect.

Variable	Description	Mean	SD	Range
Habitat variables describing the transect				
Cbare	Cover percentage of bare ground	5.1	3.4	0–15
Cstone	Cover percentage of ground cover by loose stones (size between 0.02 m and 0.2 m)	15.8	11.2	3–50
Crock	Cover percentage of ground cover by rocks (size > 0.2 m)	1.2	1.7	0–10
Cpile	Cover percentage of ground cover by stone piles	1	1.1	0–6
C0-0.25	Cover percentage of ground cover by a herbaceous strata 0–0.25 m	77.7	13	33–95
C0.25–0.5	Cover percentage of ground cover by a strata 0.25–0..5 m	9.3	8.4	1–40
C0.5–1	Cover percentage of ground cover by a strata 0.5–1 m	5.6	4.8	0–23
C1–2	Cover percentage of ground cover by a strata 1–2 m	3.5	3	0–15
C2–4	Cover percentage of ground cover by a strata 2–4 m	1.3	1.9	0–10
C4–8	Cover percentage of ground cover by a strata 4–8 m	0.4	0.9	0–6
C*pinus*	Cover percentage of ground cover by *Pinus* spp.	2.1	4.4	0–34
C*buxus*	Cover percentage of ground cover by *Buxus sempervirens*	4.3	5.9	0–33
C*juniperus*	Cover percentage of ground cover by *Juniperus communis*	1.9	3.1	0–17
C*amelanchier*	Cover percentage of ground cover by *Amelanchier ovalis*	0.5	1.2	0–8
C*crataegus*	Cover percentage of ground cover by *Crataegus monogyna*	0.1	0.4	0–2
C*rosa*	Cover percentage of ground cover by *Rosa* spp.	0.4	0.6	0–2
C*prunus*	Percentage of ground cover by *Prunus spinosa*	0.2	0.4	0–2
Hmax	Upper limit of vegetation in meters	3.3	2	0.6–9.5
H25	Height in meters of upper vegetation stratum covering more than 25%	0.2	0.1	0.1–1
Characteristics of pine forest patches and forest edge				
Age	Age of pine forest patch in years	42.7	6.1	20–57
Patch area	Area in ha of pine forest patch	356	423	11–1269
Orientation	Aspect of forest edge (N, NE, E, SE, S, SO, O, NO)			
Landscape context				
Cultivated area	Area in ha of crops within 1-km radius around the point at 75 m from edge	25	16.2	0–83
Grassland area	Area in ha of grassland formation (vegetation with shrub cover < 20%) within 1-km radius around the point at 75 m from edge	159.9	41.6	80–246
Shrubland area	Area in ha of shrubland formation (vegetation with shrub cover > 20%) within 1-km radius around the point at 75 m from edge	26.8	27.3	0–131
Open Forest area	Area in ha of open pine forest formation (vegetation with tree cover between 20% and 50%) within 1-km radius around the point at 75 m from edge	9.7	14.1	0–65
Forest area	Area in ha of pine forest formation (vegetation with tree cover > 50%) within 1-km radius around the point at 75 m from edge	78.7	30	19–174
Length	Length in km of forest edge within 1-km radius around the point at 75 m from edge	7.1	2.54	2–15

Appendix A3

Correlation of the 19 habitat variables on the two first axes extracted by the PCA.

Variable	Axis 1	Axis 2
Cbare	-11.41	-32.91
Cstone	0.18	-62.84
Cpile	4.87	2.02
Crock	4.60	-0.19
C0-0.25	0.01	73.06
C0.25-0.5	-67.99	-9.78
C0.5-1	-84.70	-0.64
C1-2	-89.31	1.01
C2-4	-73.85	13.79
C4-8	-57.69	13.22
C*pinus*	-61.19	6.22
C*junepirus*	-17.43	-8.00
C*rosa*	15.62	2.20
C*amelanchier*	-0.01	-7.03
C*buxus*	-40.23	-14.39
C*crataegus*	2.89	4.65
C*prunus*	8.48	8.48
Hmax	-64.09	15.33
H25	-3150	-568
Variance	33.5%	10.3%

Appendix A4

Akaike weights for four alternative models that describe for the nine most abundant bird species the variation in their abundance with distance from edge of the pine forest patches. For each species the best model is indicated in bold characters. The last column characterizes the change in abundance with distance to the forest edge (+ = abundance increases with distance to the forest patch edge, - = abundance decreases with distance to edge, n.t.= no trend).

Species	Null	Linear	Exponential	Logarithmic	Direction of change
Skylark	569.6	537.8	559.3	**528.4**	+
Woodlark	418.4	**407**	413.6	407.4	-
Tawny pipit	312.6	**281.5**	287.6	284.1	+
Tree pipit	203.1	**189.31**	197.5	189.32	-
Northern wheatear	276.3	252.8	261.1	**249.9**	+
Common whitethroat	167.7	167.4	169.3	**166.6**	+
Common chaffinch	**356.1**	357.9	357.9	357.6	n.t.
Linnet	310.2	**306**	307.8	306.3	+
Yellowhammer	**441.4**	443.1	443.4	442.2	n.t.

Appendix A5

Songbird abundance variation in steppe-like grasslands with distance to the edge of adjacent pine forests. Abundance values are successively given for all species pooled (Overall), for species segregated by biological traits or conservation status and for the nine most common species.

	Distance from edge						
	0–50 m	50–100 m	100–150 m	150–200 m	200–250 m	250–300 m	TOTAL
Overall	73	101	96	124	117	143	654
Habitat selection							
Open	15	49	61	88	89	117	419
Forest	10	10	5	3	6	2	36
Both	48	42	30	33	22	24	199
Shrub selection							
Shrub	22	39	46	39	44	53	243
Non-Shrub	51	62	50	85	73	90	411
Diet							
Invertebrates	22	21	27	34	37	57	198
Invertebrates and plants	44	75	65	78	72	74	408
Plants	6	5	4	11	8	12	46
0mnivore	1	0	0	1	0	0	2
Nest height							
Ground	38	50	47	71	69	94	369
Shrubs	21	35	40	35	33	41	205
Trees	14	16	9	18	15	8	80
Conservation status							
Non-SPEC	38	55	42	46	41	38	260
SPEC 2 and 3	35	46	54	78	76	105	394
Species							
Skylark	0	15	13	34	30	30	122
Woodlark	22	17	14	9	6	8	76
Tawny pipit	2	3	1	11	11	22	50
Tree pipit	12	8	3	3	1	2	29
Northern wheatear	0	1	7	9	8	17	42
Common whitethroat	1	3	3	6	5	4	22
Common chaffinch	7	12	9	14	12	8	62
Linnet	4	5	4	11	8	12	44
Yellowhammer	6	17	19	13	11	14	80