

Appendix 1



Foto 1. Spruce saplings killed by deer rubbing.

Appendix 2

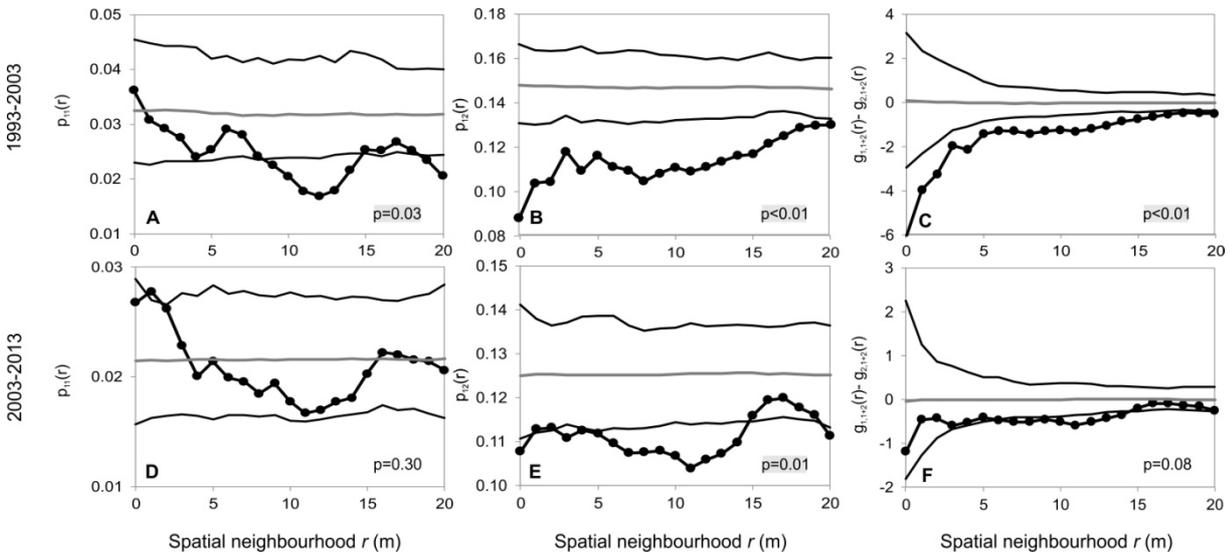


Figure A1. Analysis of overall distance- and density-dependent mortality among saplings over two time periods: 1993–2003 (A, B, C) and 2003–2013 (D, E, F). (A, D) The mark–connection function $p_{11}(r)$ describes the conditional probability that both of two randomly selected saplings separated by distance r are dead (subscript 1). (B, E) The mark–connection function $p_{12}(r)$ describes the conditional probability that the first of two randomly selected saplings separated by distance r is dead (subscript 1) and the second survived (subscript 2). (C, F) Density-dependent mortality $DDM(r) = g_{1,1+2}(r) - g_{2,1+2}(r)$ compares the mean density of saplings within distance r around dead saplings (subscript 1) with that around surviving saplings (subscript 2). Other conventions as in Fig. 2.

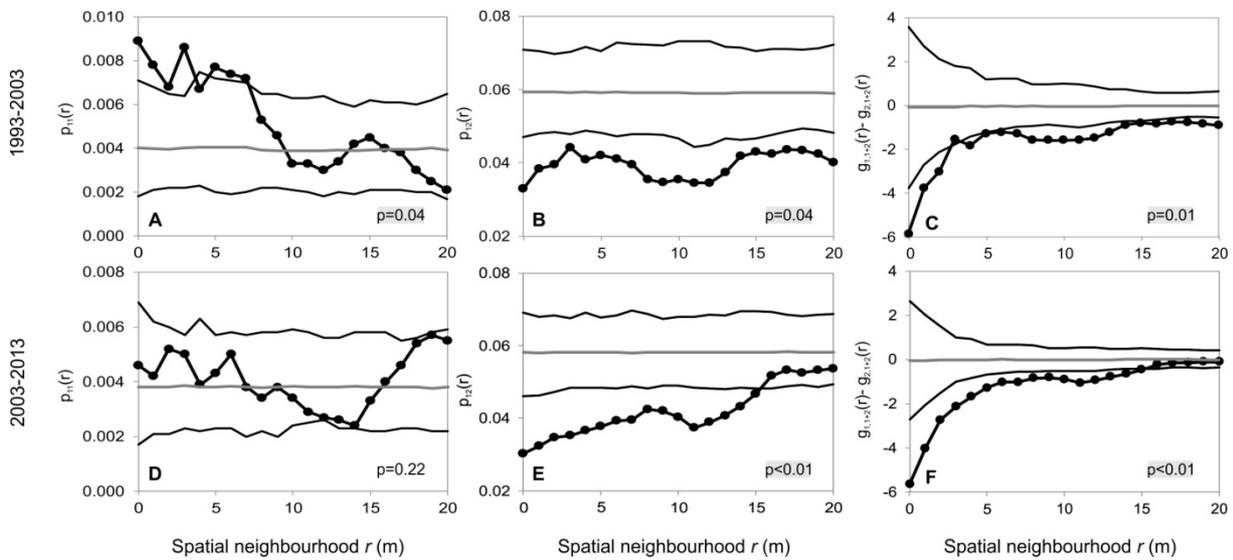


Figure A2. Analysis of distance- and density-dependent mortality caused by deer among all the other saplings over two time periods: 1993–2003 (A, B, C) and 2003–2013 (D, E, F). (A, D) The mark–connection function $p_{11}(r)$ describes the conditional probability that both of two randomly selected saplings separated by distance r are killed by deer (subscript 1). (B, E) The mark–connection function $p_{12}(r)$ describes the conditional probability that the first of two randomly selected saplings separated by distance r is killed by deer (subscript 1) and the second is not (subscript 2). (C, F) Density-dependent mortality $DDM(r) = g_{1,1+2}(r) - g_{2,1+2}(r)$ compares the mean density of saplings within distance r around saplings killed by deer (subscript 1) with that around all the other saplings (subscript 2). Other conventions as in Fig. 2.

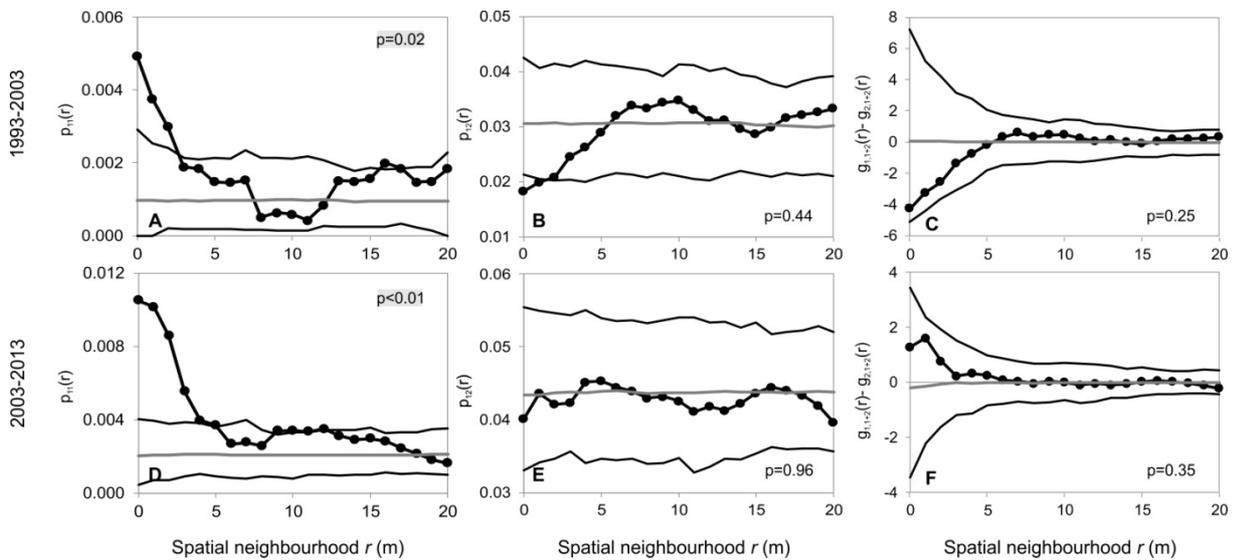


Figure A3. Analysis of distance- and density-dependent mortality caused by mechanical factors among all the other saplings over two time periods: 1993–2003 (A, B, C) and 2003–2013 (D, E, F). (A, D) The mark–connection function $p_{11}(r)$ describes the conditional probability that both of two randomly selected saplings separated by distance r are killed by mechanical factors (subscript 1). (B, E) The mark–connection function $p_{12}(r)$ describes the conditional probability that the first of two randomly selected saplings separated by distance r is killed by mechanical factors (subscript 1) and the second is not (subscript 2). (C, F) Density-dependent mortality $DDM(r) = g_{1,1+2}(r) - g_{2,1+2}(r)$ compares the mean density of saplings within distance r around saplings killed by mechanical factors (subscript 1) with that around all the other saplings (subscript 2). Other conventions as in Fig. 2.

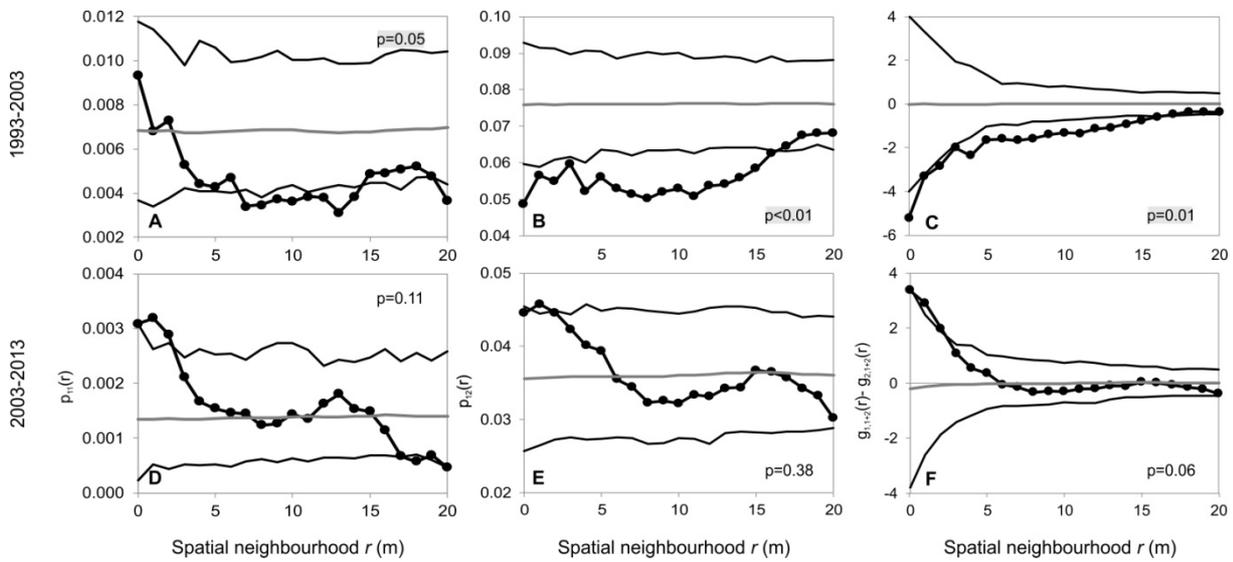


Figure A4. Analysis of distance- and density-dependent mortality caused by unknown factors among all the other saplings over the two time periods 1993–2003 (A, B, C) and 2003–2013 (D, E, F). (A, D) The mark–connection function $p_{11}(r)$ describes the conditional probability that both of two randomly selected saplings separated by distance r are killed by unknown factors (subscript 1). (B, E) The mark–connection function $p_{12}(r)$ describes the conditional probability that the first of two randomly selected saplings separated by distance r is killed by unknown factors (subscript 1) and the second is not (subscript 2). (C, F) Density-dependent mortality $DDM(r) = g_{1,1+2}(r) - g_{2,1+2}(r)$ compares the mean density of saplings within distance r around saplings killed by unknown factors (subscript 1) with that around all the other saplings (subscript 2). Other conventions as in Fig. 2.