Supplementary material part 2

Table S2.1: Overview of parameters implemented in sensitivity analyses and their effect.

Parameter	*Figure*	*Default setting*	*Extra tested values or functions*	Does general pattern remain?	Remarks
Functional response	S2.2	Type III	Type I	-	Without the extra regulating effect of a type III functional response, the system is much more unstable, resulting in very few simulations in which a predator and prey coexist.
Maximum value for movement time per day (t_m)	S2.3	3600 s	1800 s	yes	The general pattern remains.
Maximum value for movement time per day (t_m)	S2.4	3600 s	7200 s	yes	Few replicates are available for the scenario with P = 0.05 and H = 1, possibly explaining why average body mass is higher than expected.
Maximum consumption time per day (t_f)	S2.5	52 000 s	36 000 s	yes	By lowering maximum consumption time, competition is weakened. The general pattern remains.
Maximum consumption time per day (t_f)	S2.6	52 000 s	72 000 s	-	Increased consumption results in stronger competition. Therefore, few simulations survive.
Growth speed resource (r)	S2.7	0.9	1.5	yes	The general pattern remains.

Growth speed resource (r)	S2.8	0.9	0.5	yes	The general pattern remains. When P = 0.05 and H = 1 or H = 0.5, only few replicates survive. This explains why average body mass is higher when P = 0.05 and H = 1 than when P = 0.05 and H = 0.5.
Perceptual range (d_{per})	S2.9	301 *W* + 0.097	133.779*W* + 0.0987	yes	The largest individuals have a perceptual range of 0.5 m instead of 1 m. The general pattern remains. However, the outcome of simulations at P = 0.05 varies strongly. Therefore, the effect of H on average body mass is less clear.
Perceptual range (d_{per})	S2.10	301 *W* + 0.097	331.104*W* +0.00669	yes	The general pattern remains.
Carrying capacity resource (K)	S2.11	2000 J	1000 J	-	Due to the lower carrying capacity, few resources are present. Therefore, predators and prey only survive in a few simulations.
Carrying capacity resource (K)	S2.12	2000 J	3000 J	yes	The general patter remains. However, when P = 0.05 and H = 1, the predator and prey only survive in a few simulations, explaining the unclear outcome of this scenario.
Herbivore and predator move equally fast	S2.13			yes	The general pattern remains.
No optimal body size ratio included	S2.14				The general pattern remains.
Immigration (q)	S2.15	0.1	0	-	Predator and prey cannot coexist within a simulation if immigration is turned off.
Immigration (q)	S2.16	0.1	0.01	-	Predator and prey survive in few simulations when immigration rate is low.
Number of eggs per clutch (N)	S2.17	15	2	no	By constraining clutch size, the growth speed of the herbivore is lowered. As such, the herbivore becomes rarer, promoting predator mobility when *P* is high. When *P* is lowered, the largest predators can no longer persist due to herbivore limitation. As such, average predator mass is decreasing. Still, when *P* equals 0.05, average predator mass is larger when *H* equals 0.05 than when *H* equals 1.
Number of eggs per clutch (N)	S2.18	15	50	yes	By increasing the number of individuals per clutch, competition for resources and herbivores is increased. Thereby, the herbivore and predator survive in few simulations (Table S2.1), except when *P* equals 0.20 and *H* = 0.5 or *P* = 0.05 and *H* = 0. Apparently, some level of fragmentation facilitates coexistence. Average body mass is larger in *P* = 0.50 and *H* = 1 than expected. This might be due to the low number of replicates (4) that survived for this landscape type.

Table S2.1: Overview of number of included simulations per scenario. Only simulations in which the predator persists during the final 500 days of a simulation are included within the analysis.

	P0.05 H0	P0.05 H0.5	P0.05 H1	P0.20 H0.5	P0.20 H1	P0.50 H1	P0.90 H1
d_{per}=331.104W +0.00669	6	41	35	39	36	45	39
Carrying capacity resource 1000	5	0	3	1	0	0	0
Functional response type I	1	0	0	0	0	1	0
Maximum value t_m =1 800 s	19	15	10	20	17	17	12
Growth speed resource 0.5	6	4	4	6	11	16	9
Output default	21	5	10	23	16	13	13
Carrying capacity resource 3000	27	19	6	25	26	24	10
Maximum value t_f = 36 000 s	27	23	15	42	44	33	4
Herbivore and predator move equally fast	18	8	7	19	20	11	10
Maximum value t_f = 72 000 s	1	0	1	6	4	10	2
Growth speed resource 1.5	41	25	13	43	29	32	16
d_{per} = 133.779W + 0.0987	18	9	9	16	21	14	9
Maximum value t_m = 7 200 s	33	10	4	17	12	20	4
Immigration rate 0	0	0	0	1	1	0	0
Immigration rate 0.01	0	1	1	5	0	3	7
2 eggs per clutch	9	8	8	17	25	28	27
50 eggs per clutch	10	2	2	7	3	4	0

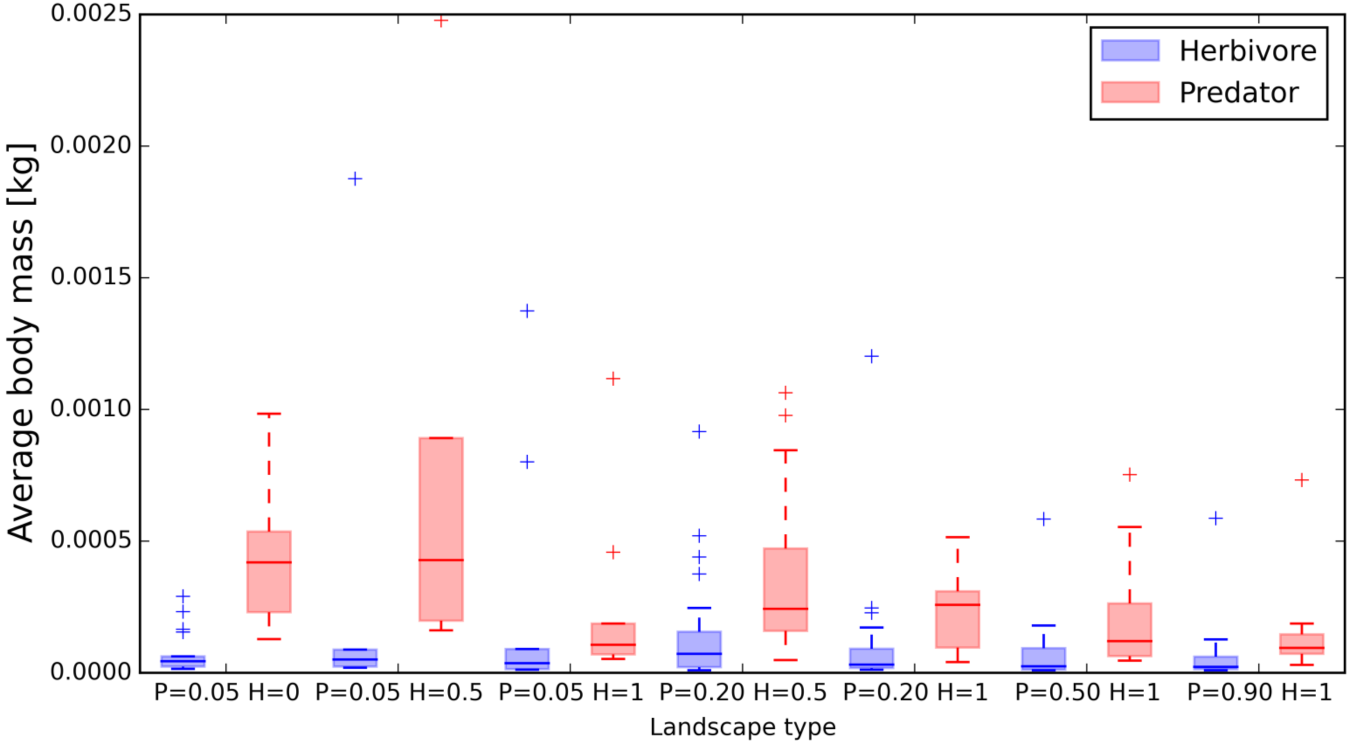

Figure S2.1: Output of default settings.

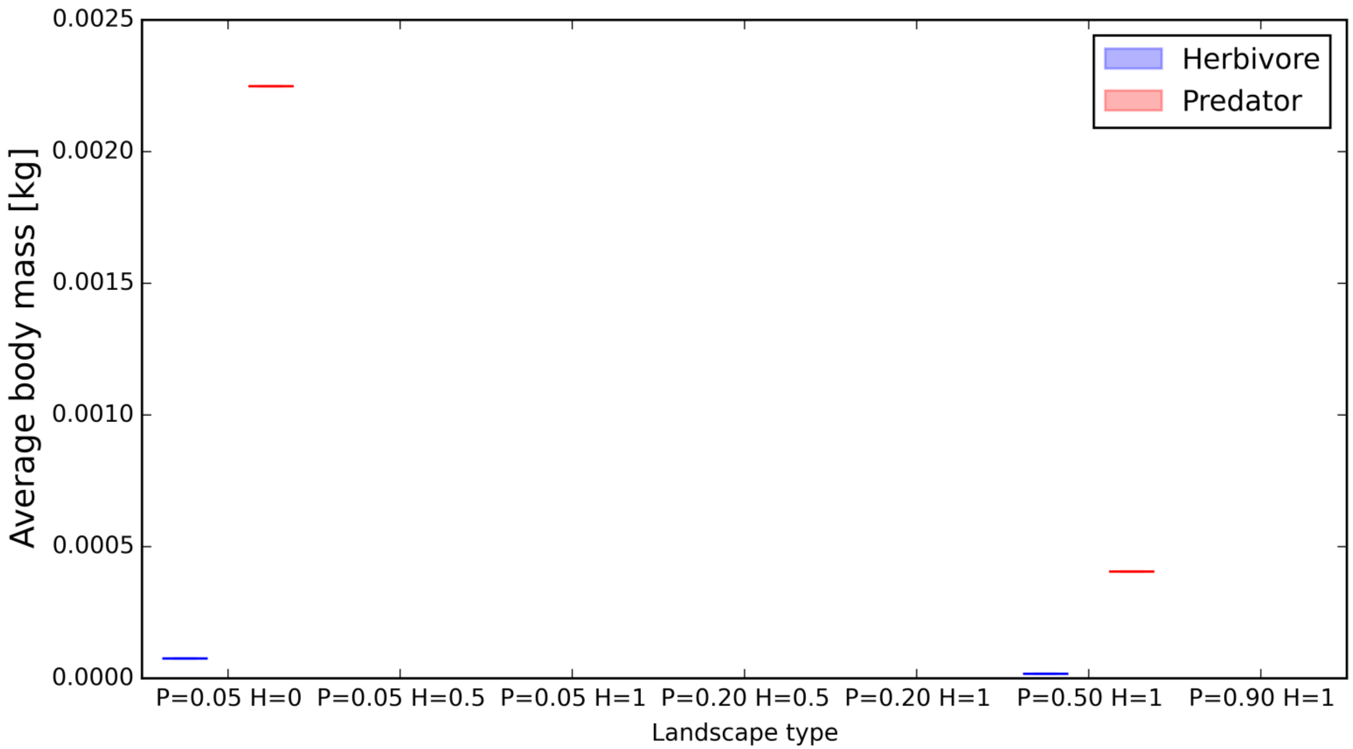

Figure S2.2: Functional response type III, is replaced by a type I functional response. Without the extra regulating effect of a type III functional response, the system is much more unstable, resulting in very few simulations in which the predator and prey coexist (see Table S2.1).

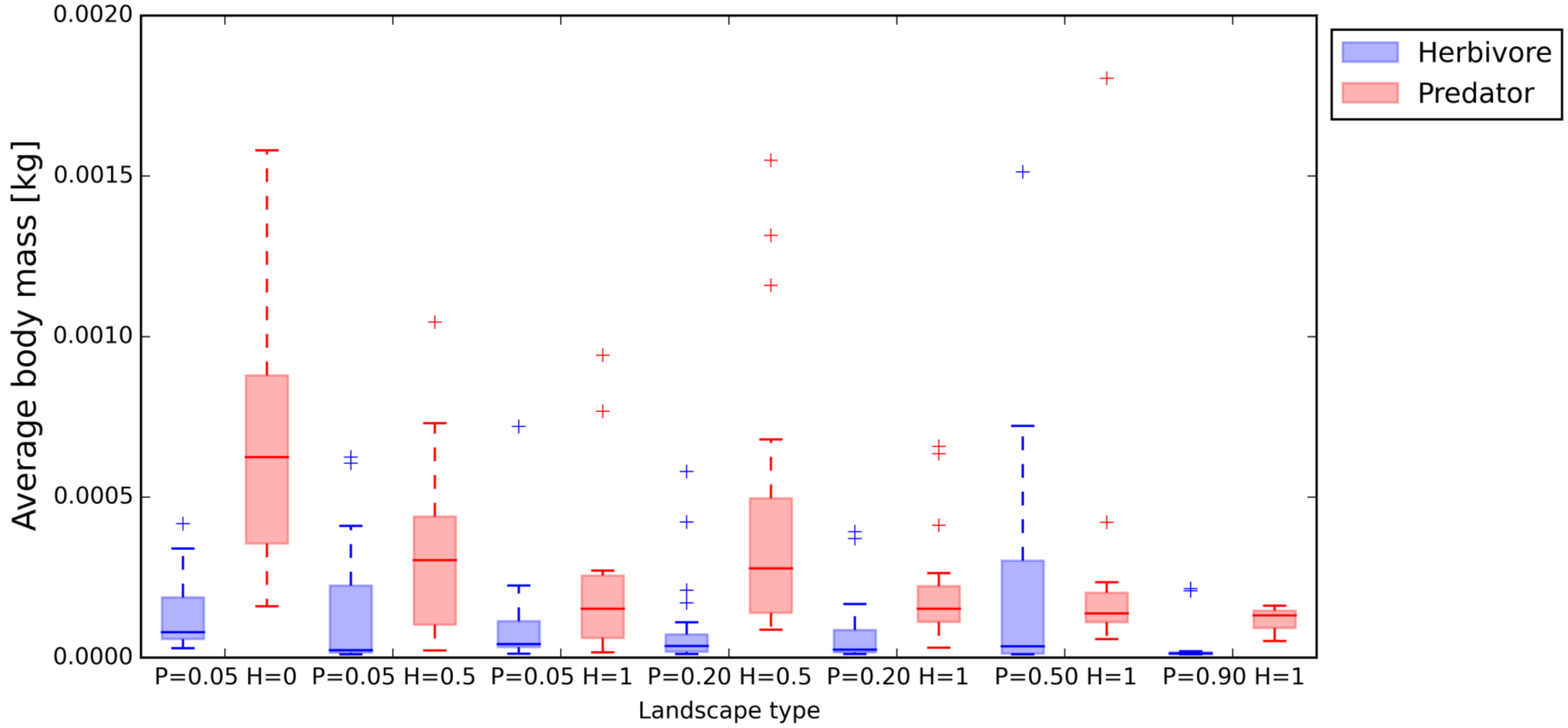

Figure S2.3: Moving maximally 30 minutes per day (maximum value t_m= 1800 s). The general pattern remains.

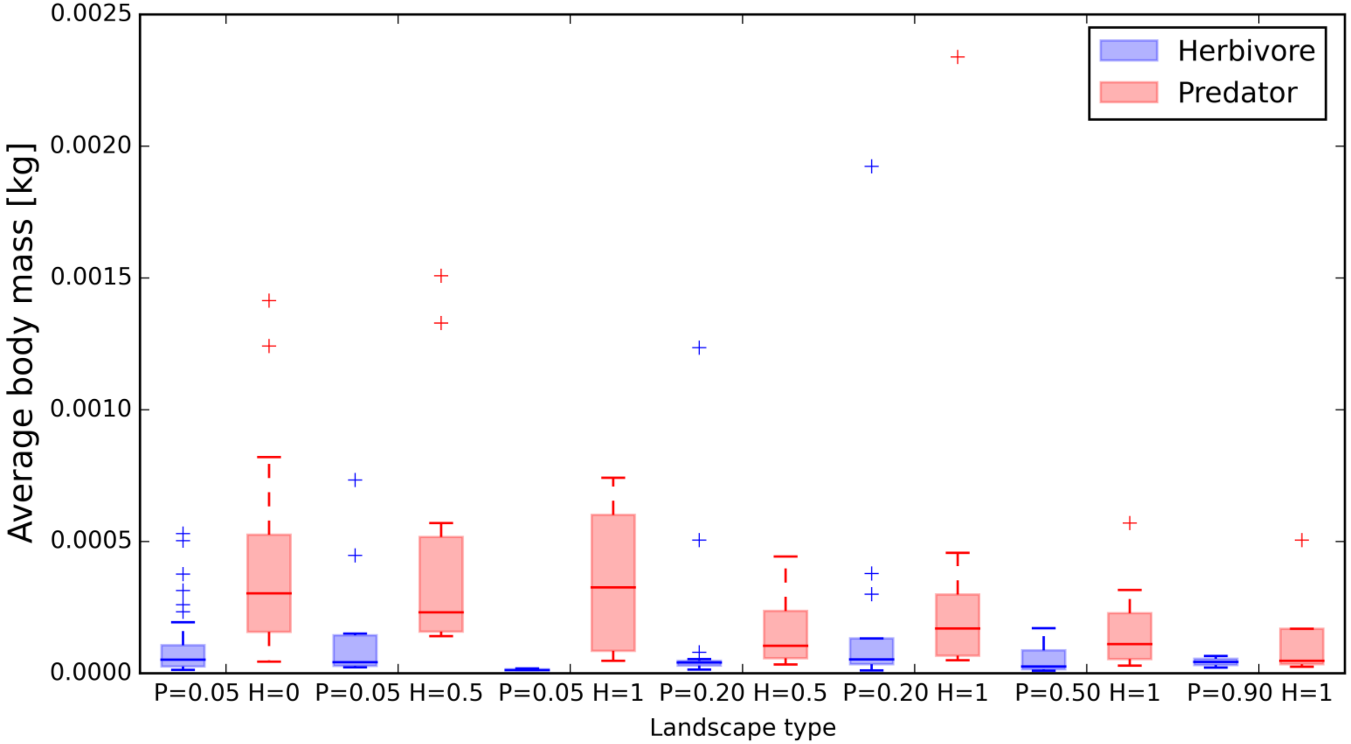

Figure S2.4: Moving maximally 2 hours per day (maximum value t_m = 7200 s). The general pattern remains. Few replicates are available for the scenario with *P* = 0.05 and *H* = 1, possibly explaining why average body mass is higher than expected.

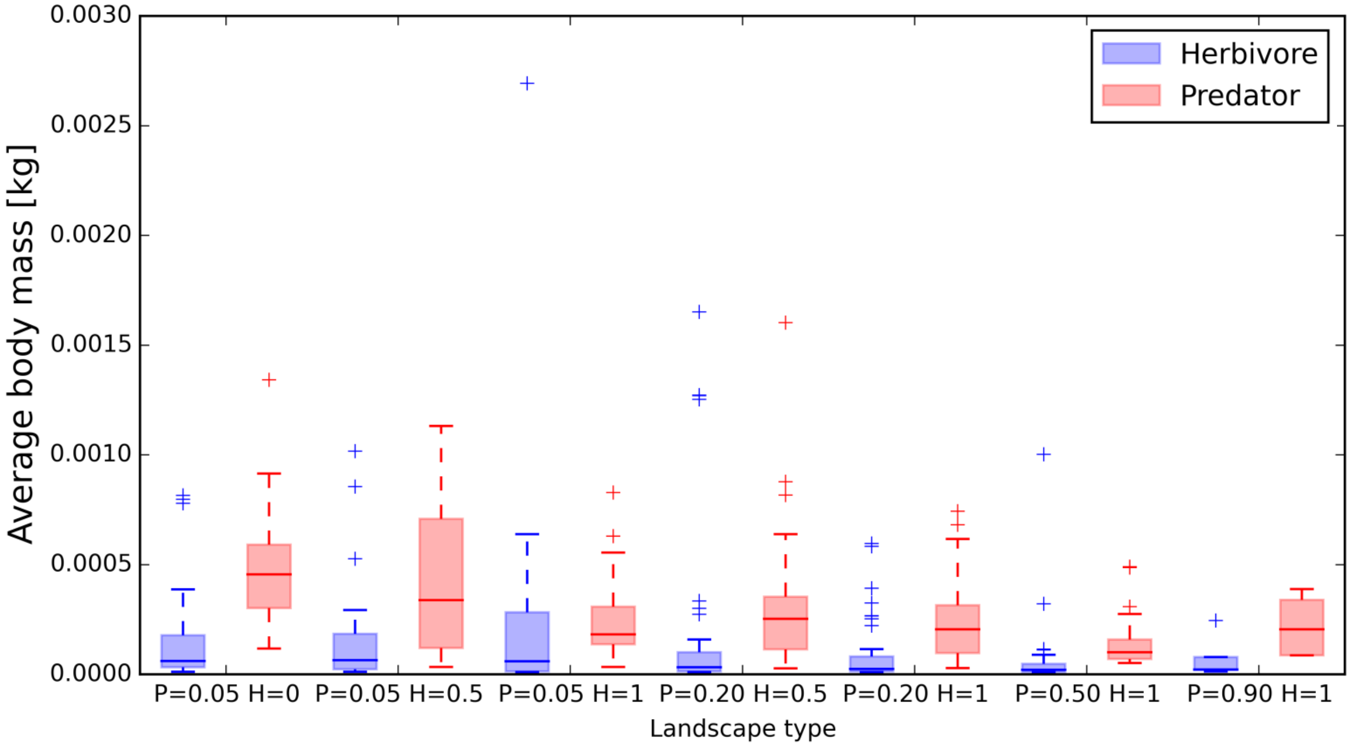

Figure S2.5: Consuming maximally 10 hours per day (t_f = 36000 s). The general pattern remains.

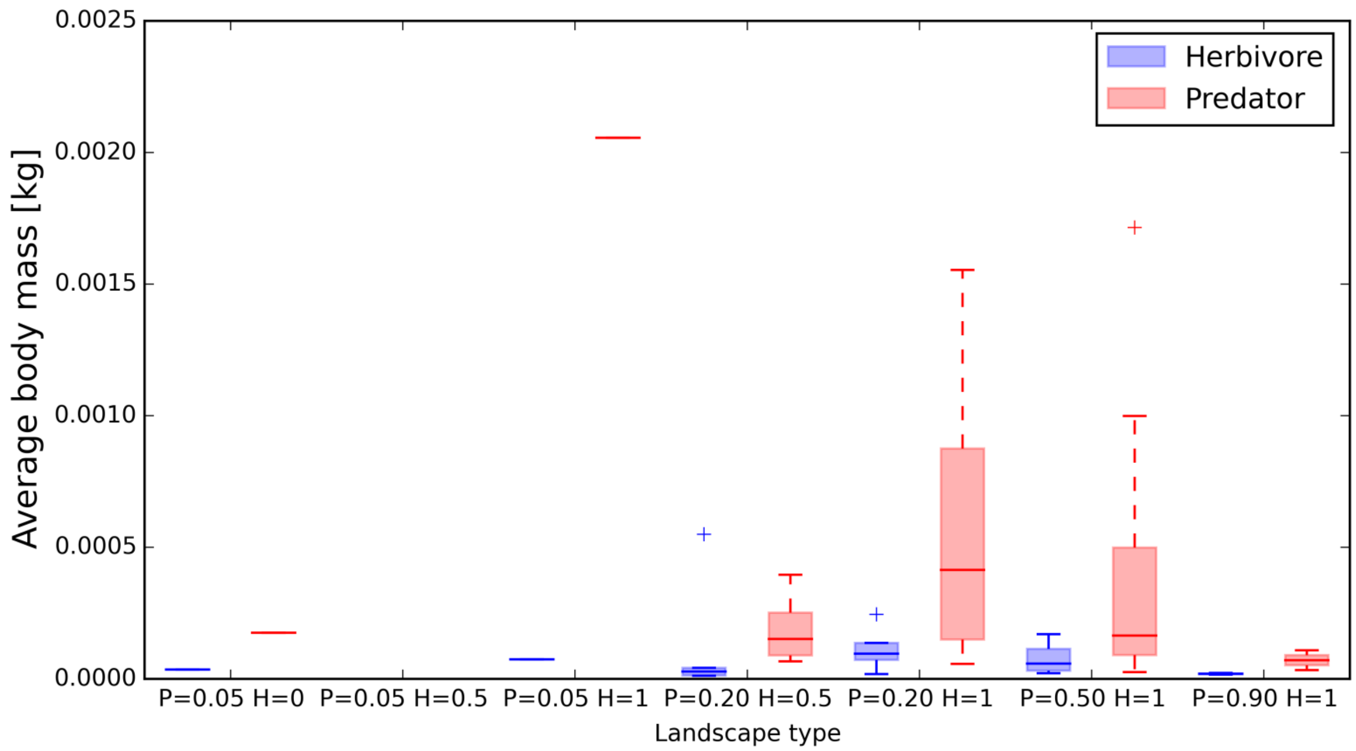

Figure S2.6: Consuming maximally 20 hours per day (t_f = 72 000 s). Increased consumption results in stronger competition. Therefore, few simulations survive.

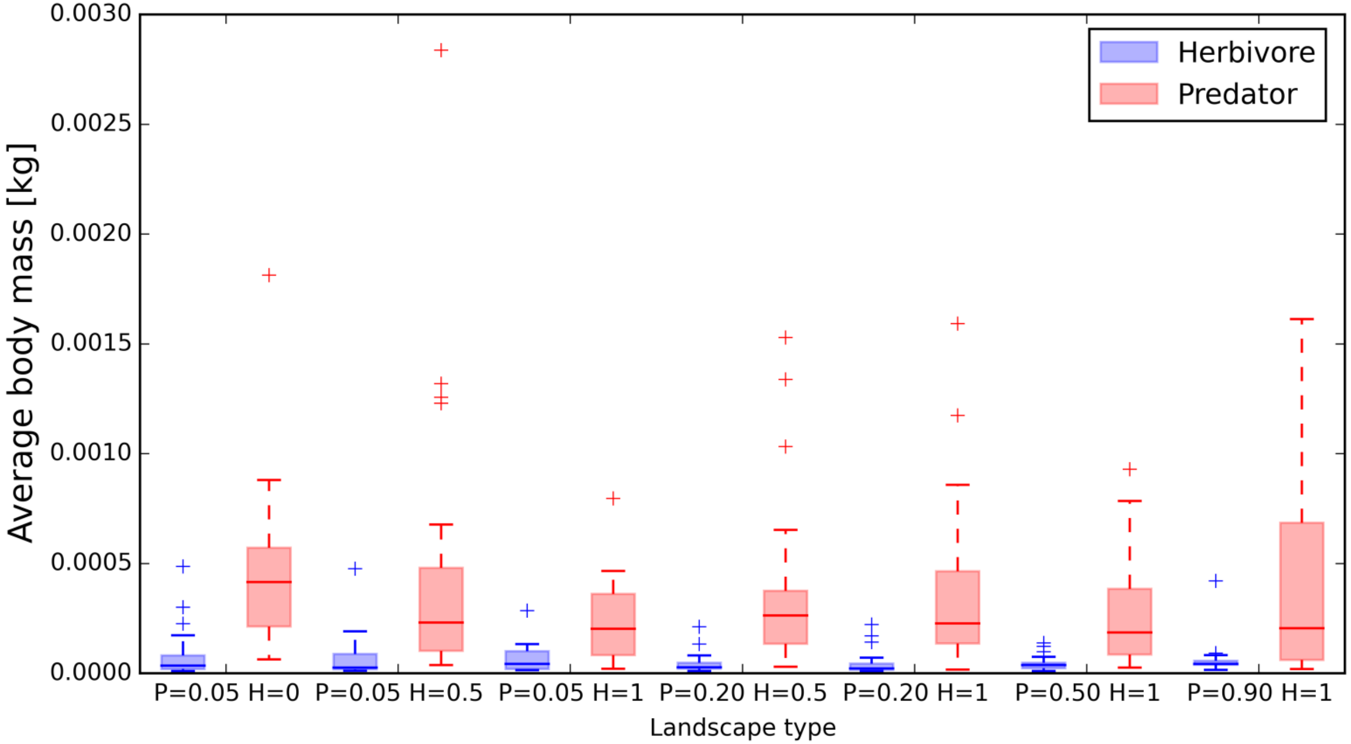

Figure S2.7: Growth speed of the resource equals 1.5 (r=1.5). General pattern remains.

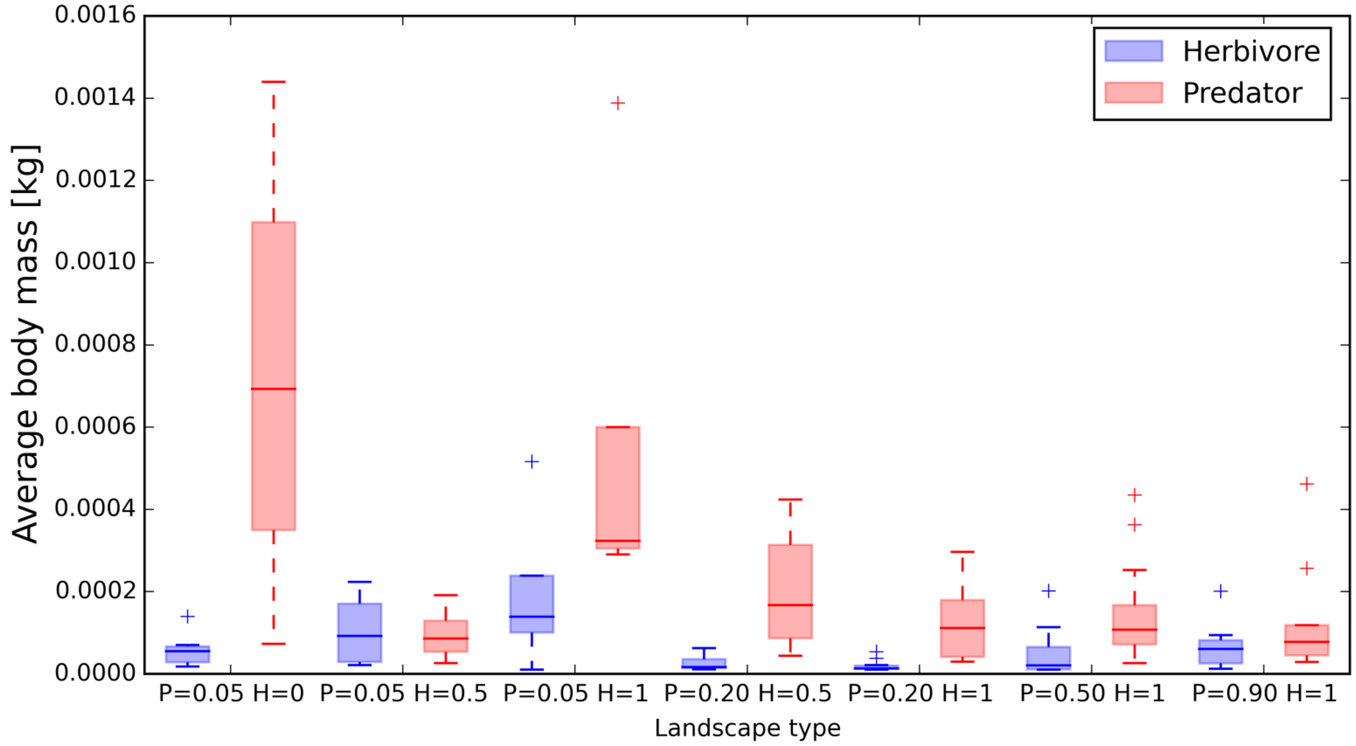

Figure S2.8: Growth speed of the resource equals 0.5 (r=0.5). The general pattern remains. When P = 0.05 and H = 1 or 0.5, only few replicas survive. This explains why average body mass is higher when P = 0.05 and H = 1 than when P = 0.05 and H = 0.5.

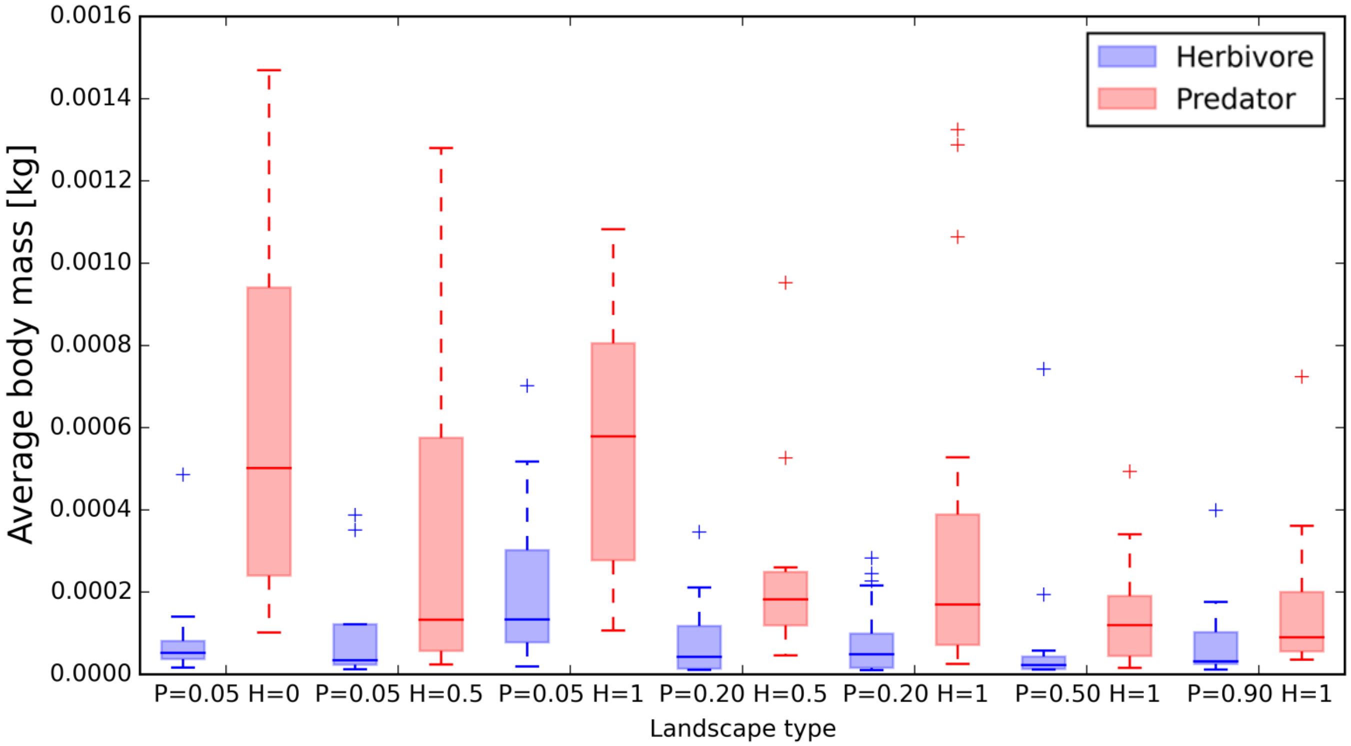

Figure S2.9: The largest individuals have a perceptual range of 0.5 m instead of 1m (d_{per} = 133.779*W* + 0.0987). The general pattern remains. However, the outcome of simulations at P = 0.05 varies strongly. Therefore, the effect of H on average body mass is less clear.

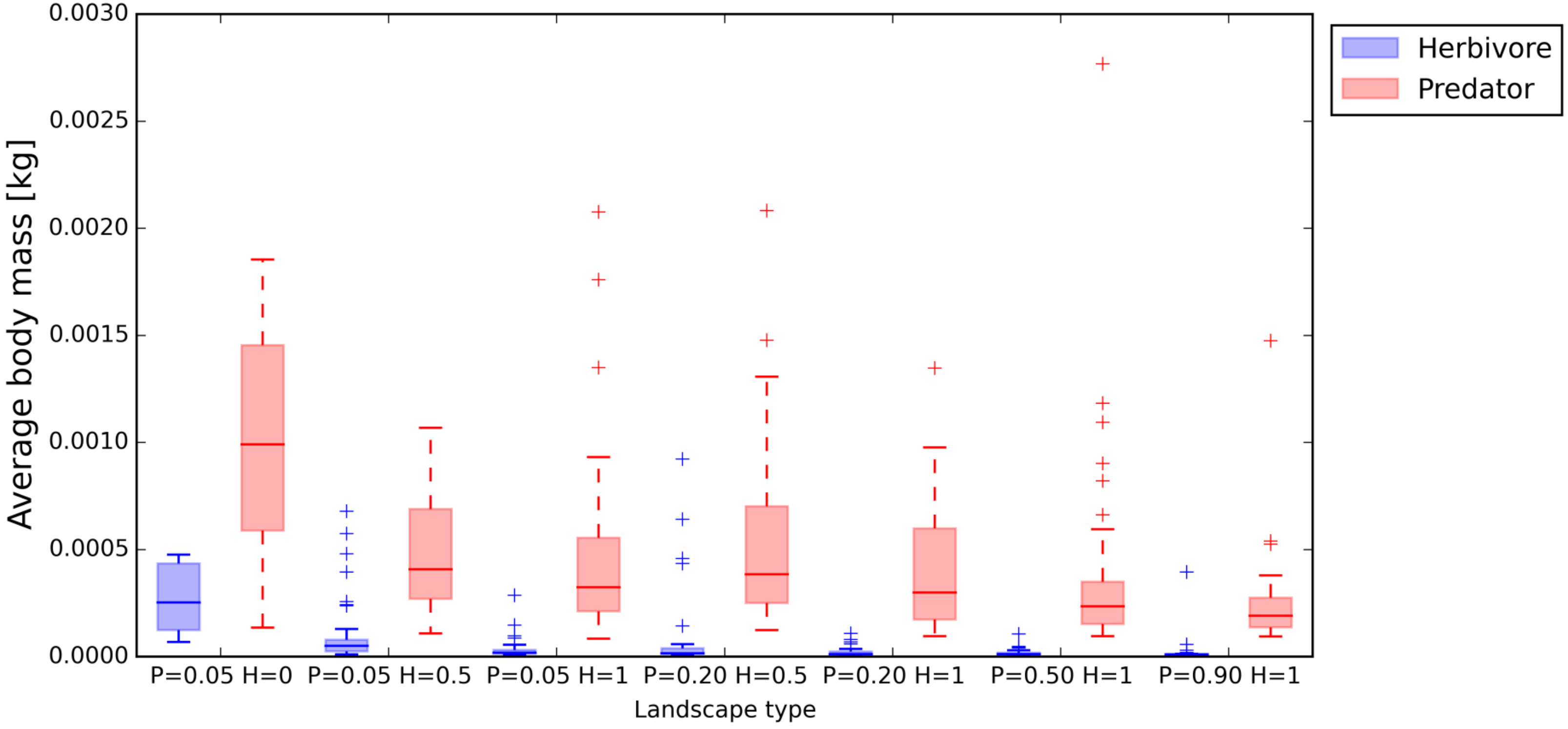

Figure S2.10: The smallest individuals have a perceptual range of 0.01 m instead of 1 m (d_{per} = 331.104W + 0.00669). The general pattern remains.

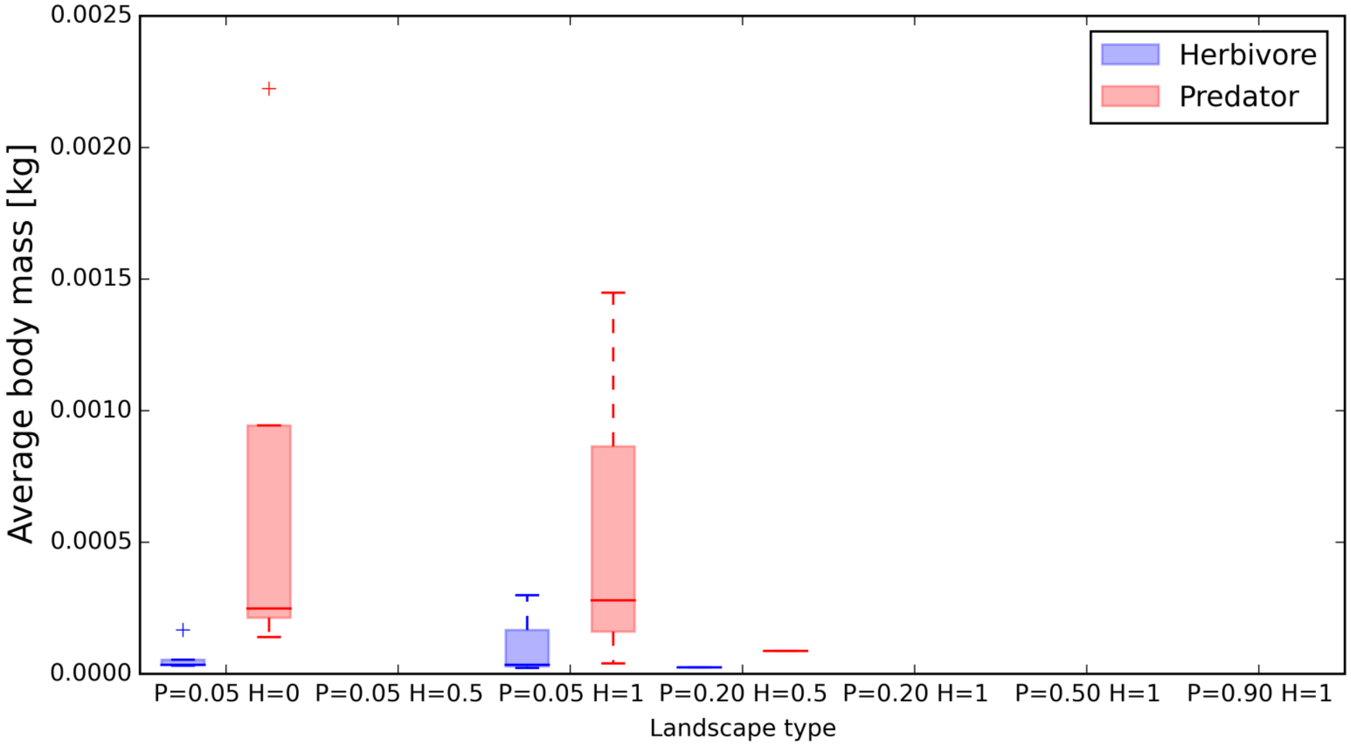

Figure S2.11: Carrying capacity of resource equals 1000 J (K = 1000). Due to the lower carrying capacity, few resources are present. Therefore, predators and prey only survive in few simulations.

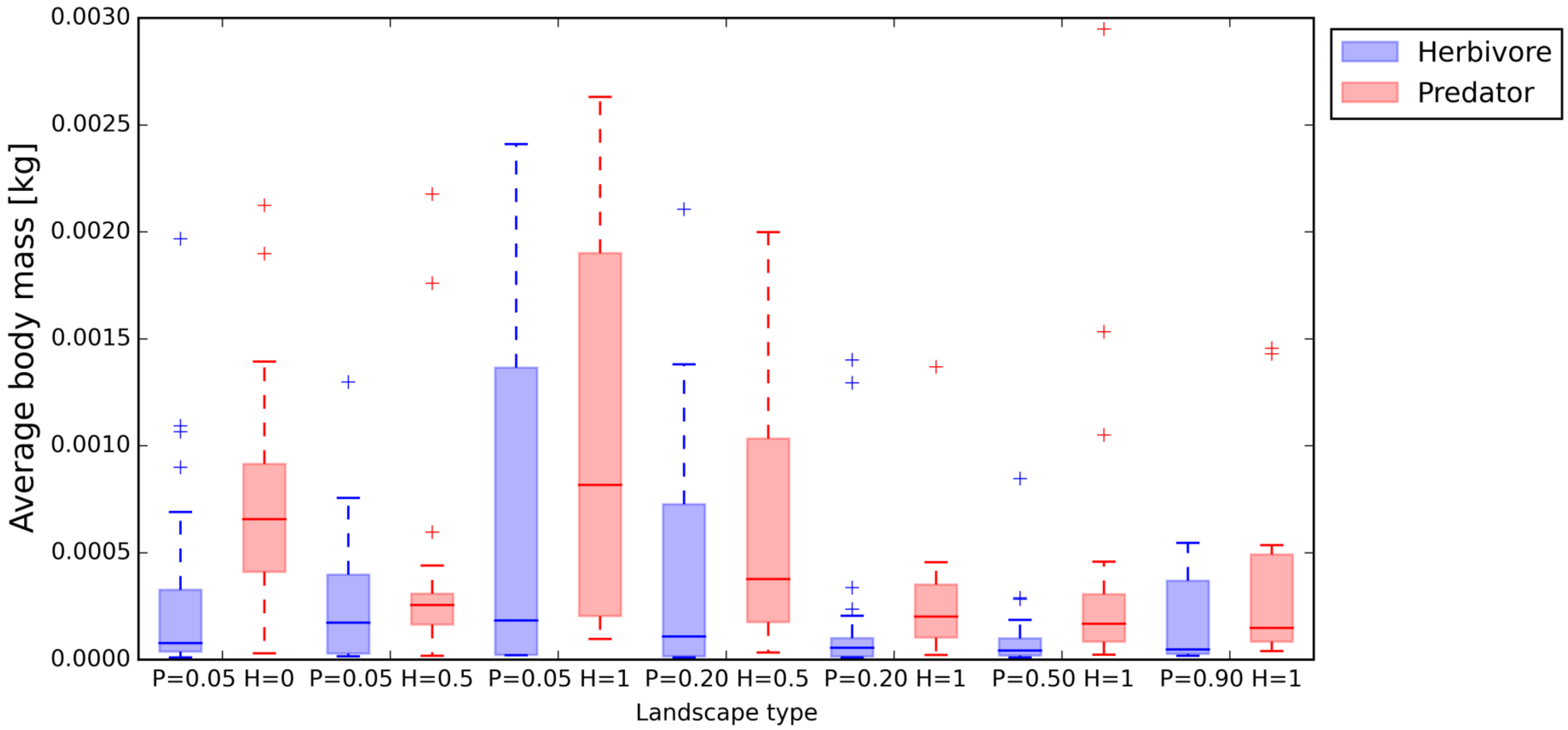

Figure S2.12: Carrying capacity of resource equals 3000 J (K=3000). The general pattern remains. However, when P = 0.05 and H = 1, the predator and prey only survive in few simulations, explaining the unclear outcome of this scenario.

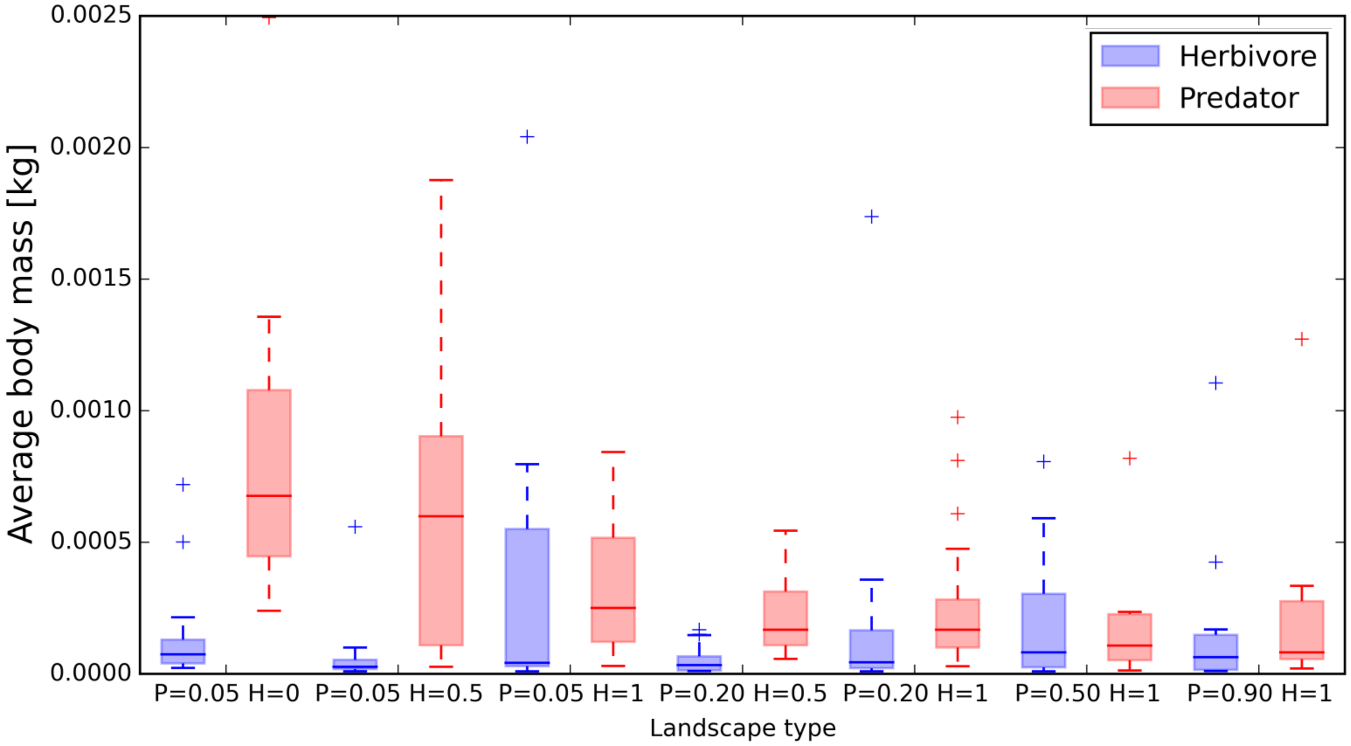

Figure S2.13: Herbivore and predator move equally fast. Moreover, they experience the same cost of moving. The general pattern remains.

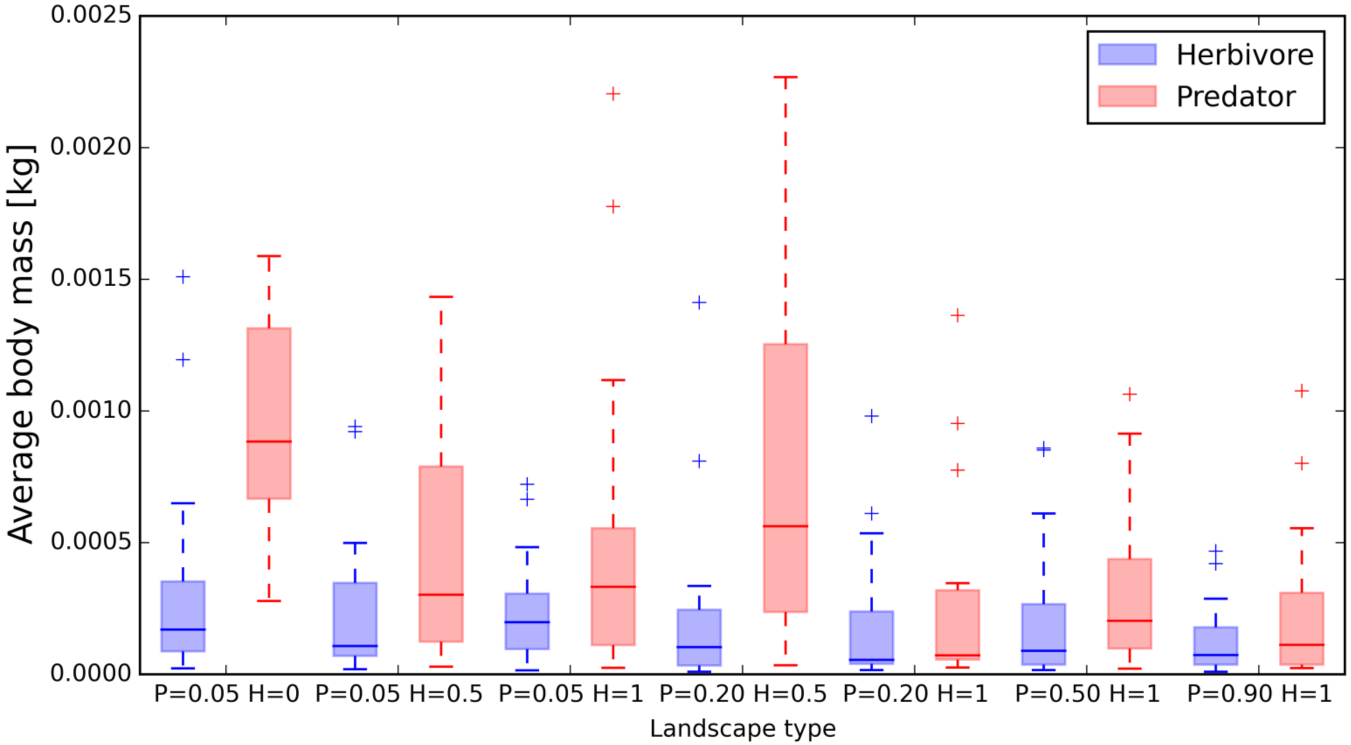

Figure S2.14: No optimal predator-herbivore body size ratio is included. The general pattern remains.

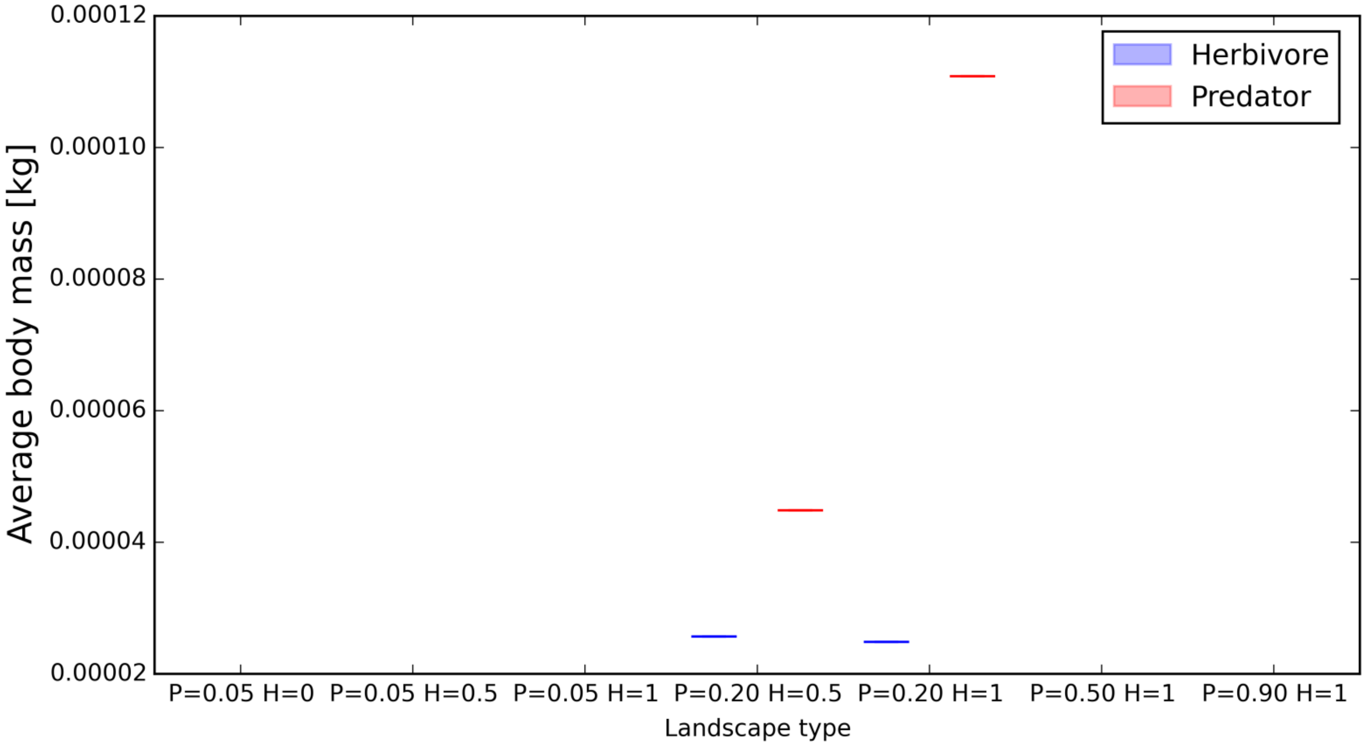

Figure S2.15: Immigration rate fixed at 0 (q = 0) for predator and herbivore. Predator and prey cannot coexist within a simulation if immigration is turned off.

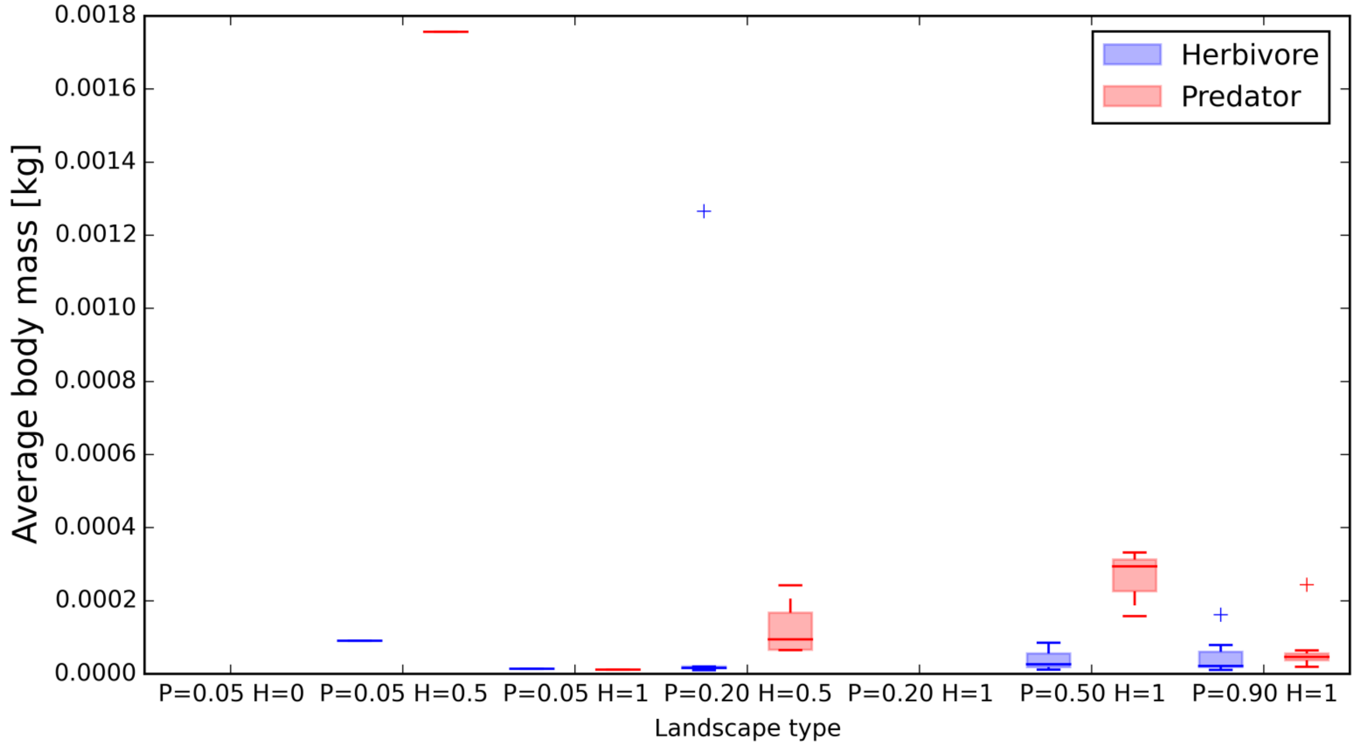

Figure S2.16: Immigration rate fixed at 0.01 (q = 0.01) for herbivore and predator. Predator and prey survive in few simulations when immigration rate is low.

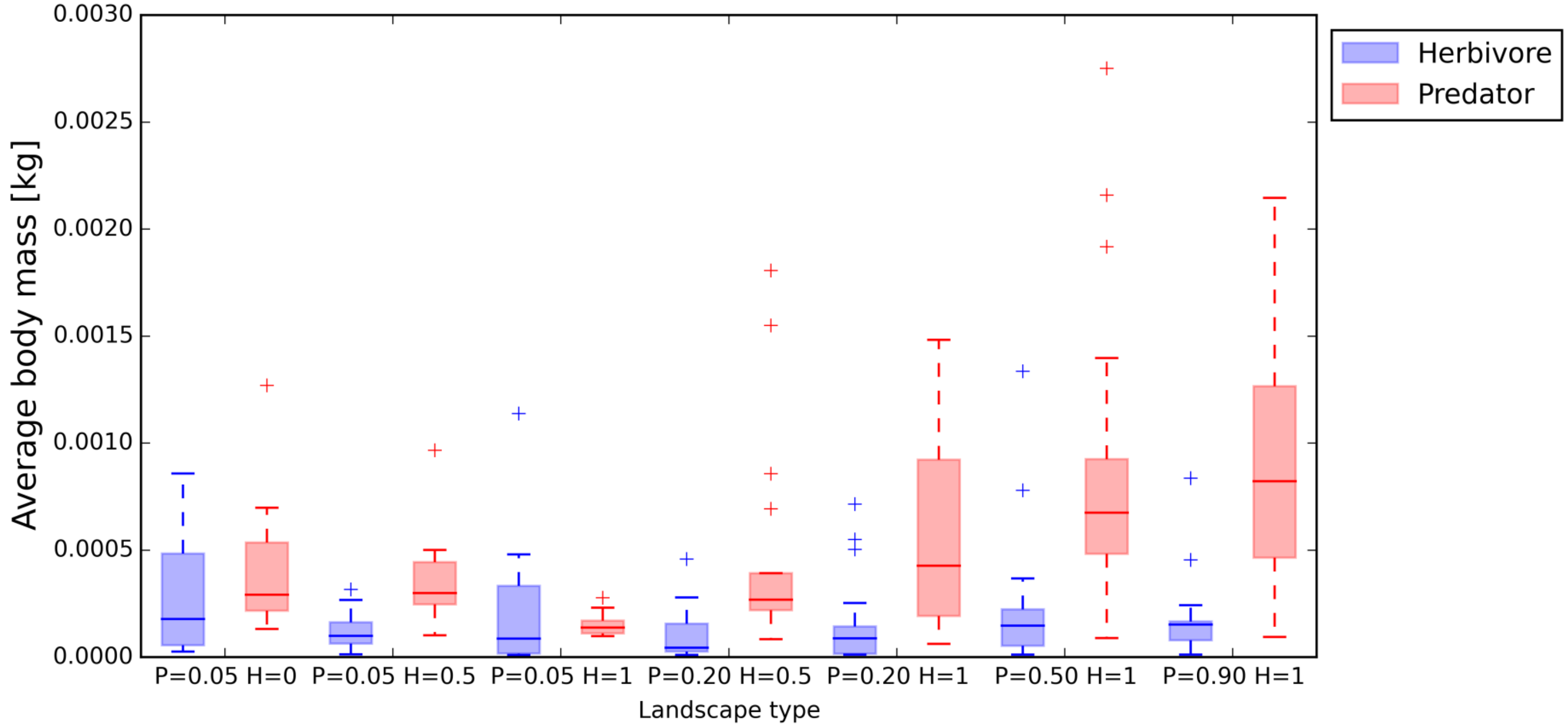

Figure S2.17: 2 eggs per clutch. By constraining clutch size, the growth speed of the herbivore is lowered. As such, the herbivore becomes rarer, promoting predator mobility when *P* is high. When *P* is lowered, the largest predators can no longer persist due to herbivore limitation. As such, average predator mass is decreasing. Still, when *P* equals 0.05, average predator mass is larger when *H* equals 0.05 than when *H* equals 1.

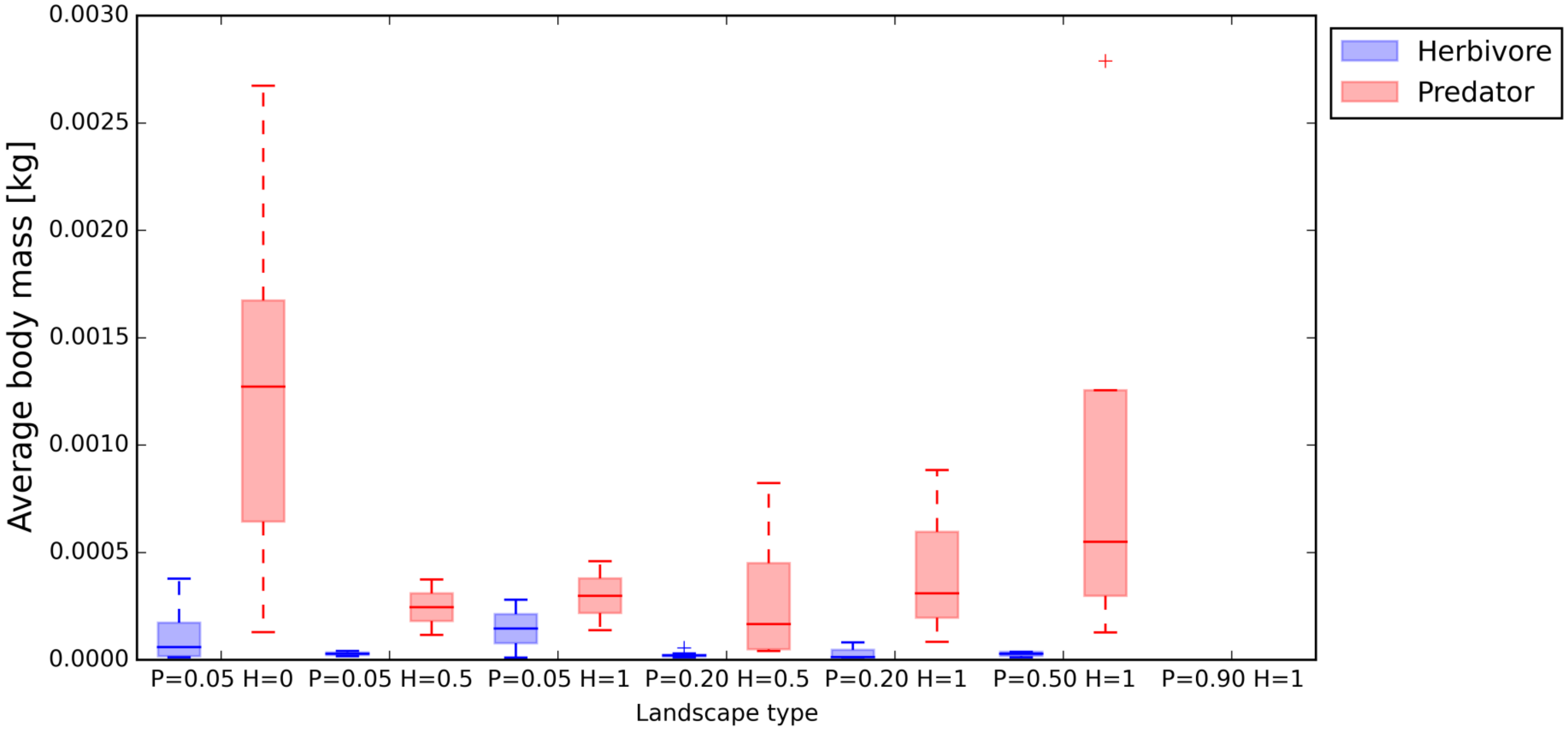

Figure S2.18: 50 eggs per clutch. By increasing the number of individuals per clutch, competition for resources and herbivores is increased. Thereby, the herbivore and predator survive in few simulations (Table S2.1), except when *P* equals 0.20 and H = 0.5 or P = 0.05 and H = 0. Apparently, some level of fragmentation facilitates coexistence. Average body mass is larger in *P* = 0.50 and H = 1 than expected. This might be due to the low number of replicates (4) that survived for this landscape type.