

Effect of Distance and Neighbor Size on *Abies hickelii*: The Asymmetric Competition Is Aggravated in an Endangered Species.

Supplementary Materials

Table S1. Regression coefficients and fit indicators obtained when evaluating the joint effect of horizontal relative size and vertical relative size on the variables of interest.

Variable assessed	Combined effect of	Standardized coefficients	SE	T-value	P-value	R2
DBH	The relative horizontal and mean distance	-0.61	0.18	-3.49	0.0010	0.1811
TH	The relative horizontal and mean distance	-0.53	0.18	-2.97	0.0044	0.1383
DBH	The relative vertical and mean distance	-0.40	0.17	-2.43	0.0184	0.0969
TH	The relative vertical and mean distance	-0.35	0.17	-2.07	0.0436	0.0719

Table S2. Cohen's index values (d) and their respective 95% confidence intervals.

Competitor's position	Variable assessed	Cohen's d	Lower limit of d	Upper limit of d
Neighbor 1*	DBH	0.44	-0.13	1.01
	TH	0.58	0.01	1.15
Neighbor 2*	DBH	0.11	-0.43	0.66
	TH	0.16	-0.39	0.70
Neighbor 3	DBH	-0.06	-0.63	0.51
	TH	-0.03	-0.60	0.55
Neighbor 4*	DBH	0.22	-0.35	0.78
	TH	0.28	-0.28	0.85
Neighbor 5*	DBH	1.05	0.37	1.73
	TH	1.01	0.33	1.68

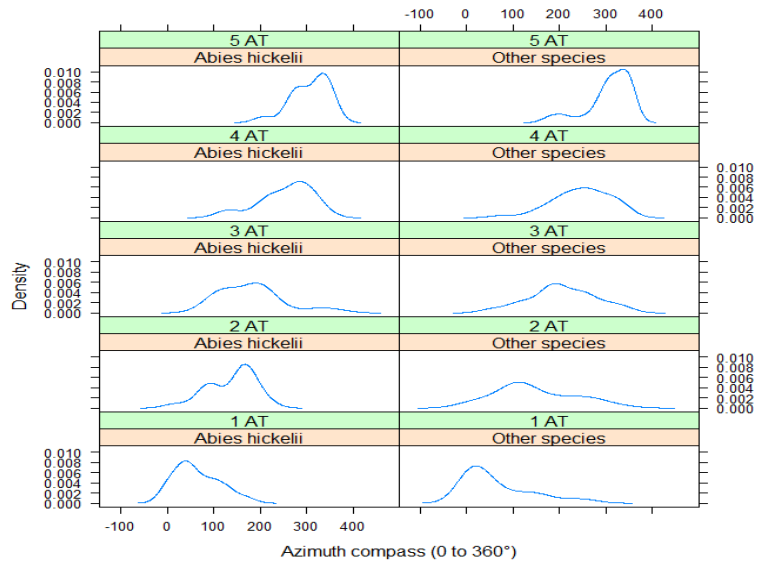


Figure S1. Density curves of the distribution of the first five neighbors of *A. hickelii* with respect to azimuth.

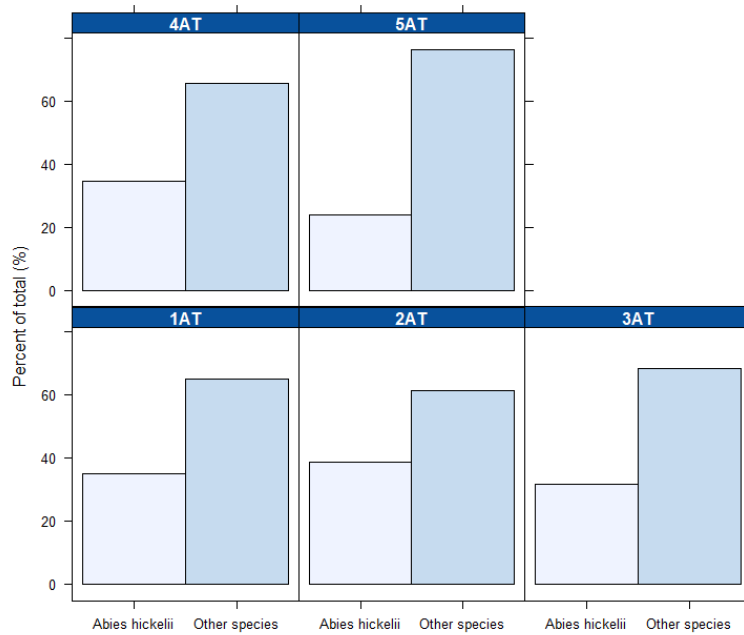


Figure S2. The frequency (%) of the first five neighbors of *A. hickelii* with a diameter greater than or equal to 7.5 cm. The locations occupied by the neighbors are denoted as 1AT, 2AT, 3AT, 4AT and 5AT, indicating the first, second, third, fourth and fifth positions, respectively.

Raw data before any filtering

id1	id-tree	dist	azimut	dn	h	sppvecino
10-C-uno	AR			15.87	12	Abies hickelii
10-C-uno	4AT	3.1	27	11.4	11.4	Abies hickelii
10-C-uno	5AT	3.14	150	18.79	13	Other species
10-C-uno	1AT	2.15	178	22.6	13	Other species
10-C-uno	2AT	2.35	313	23.62	14	Other species
10-C-uno	3AT	2.5	335	14.22	12	Other species
10-C-dos	AR			9.14	10	Abies hickelii
10-C-dos	4AT	3.6	82	23.36	14	Other species
10-C-dos	3AT	2.3	275	10.03	9	Other species
10-C-dos	2AT	1.7501	312	10.16	11	Abies hickelii
10-C-dos	1AT	1.75	336	10.16	11.3	Abies hickelii
10-C-dos	5AT	4	357	8.12	7.5	Other species
10-120-uno	AR			8.68	11.5	Abies hickelii
10-120-uno	1AT	1.15	12	8	9.5	Other species
10-120-uno	4AT	4.2	135	66.04	35.4	Other species
10-120-uno	3AT	3.25	196	8.12	10	Abies hickelii
10-120-uno	2AT	1.7	205	7.74	10.5	Abies hickelii
10-120-uno	5AT	5.5	211	11.43	8	Other species
10-120-dos	AR			7.62	9	Abies hickelii
10-120-dos	4AT	3.45	24	75.94	40.4	Other species
10-120-dos	2AT	3.15	96	11.93	8.5	Other species
10-120-dos	5AT	4.4	156	48	27.4	Other species
10-120-dos	1AT	2.3	169	41.52	35.4	Other species
10-120-dos	3AT	3.3	272	7.74	9	Abies hickelii
9-C-uno	AR			12.95	13	Abies hickelii
9-C-uno	3AT	4.2	262	9.14	10	Other species
9-C-uno	4AT	4.6	272	24.63	17	Other species
9-C-uno	2AT	2.95	330	52.57	33	Other species
9-C-uno	5AT	4.8	346	7.62	9	Other species
9-C-uno	1AT	1.3	354	8.89	10	Abies hickelii
9-C-dos	AR			8.89	10	Abies hickelii
9-C-dos	1AT	1.25	170	12.95	13	Abies hickelii
9-C-dos	4AT	4.4	246	9.14	10	Other species
9-C-dos	5AT	4.45	267	24.63	17	Other species
9-C-dos	2AT	1.8	320	52.57	33	Other species
9-C-dos	3AT	2.7	343	7.62	9	Other species
9-120-uno	AR			60.32	39.5	Abies hickelii
9-120-uno	4AT	5.5	45	8.12	8.5	Abies hickelii
9-120-uno	2AT	3.8	66	78.23	37	Other species
9-120-uno	5AT	5.5	90	10.16	8.5	Abies hickelii

9-120-uno	1AT	3.15	317	58.03	42.2	Abies hickelii
9-120-uno	3AT	5.3	317	19.55	9.4	Other species
9-120-dos	AR			7.87	6	Abies hickelii
9-120-dos	1AT	2.9	104	24.89	17	Other species
9-120-dos	2AT	3.5	215	10.16	8.5	Abies hickelii
9-120-dos	3AT	3.7	246	78.23	37	Other species
9-120-dos	4AT	3.75	275	8.12	8.5	Abies hickelii
9-120-dos	5AT	4.5	303	12.95	9	Other species
9-240-uno	AR			50.54	28.4	Abies hickelii
9-240-uno	5AT	3.85	85	12.19	13	Abies hickelii
9-240-uno	4AT	3.68	91	7.62	7.4	Abies hickelii
9-240-uno	2AT	1.15	116	7.62	9.5	Abies hickelii
9-240-uno	1AT	0.65	198	17.27	15	Other species
9-240-uno	3AT	2.4	353	10.71	9	Other species
9-240-dos	AR			7.62	7.4	Abies hickelii
9-240-dos	3AT	2.6	7	14.5	10	Other species
9-240-dos	1AT	0.4	18	12.19	13	Abies hickelii
9-240-dos	5AT	4.3	252	17.27	15	Other species
9-240-dos	2AT	2.6	257	7.62	9.5	Abies hickelii
9-240-dos	4AT	3.65	263	50.54	28.4	Abies hickelii
8-C-uno	AR			26.03	21.5	Abies hickelii
8-C-uno	5AT	5.55	19	81.91	41.4	Other species
8-C-uno	3AT	4.82	93	9.9	7.5	Other species
8-C-uno	1AT	4.4	123	9.9	8.5	Abies hickelii
8-C-uno	2AT	4.65	256	56.26	28	Other species
8-C-uno	4AT	5.5	276	12.19	13.5	Abies hickelii
8-C-dos	AR			9.9	8.5	Abies hickelii
8-C-dos	1AT	2.62	28	10.03	7.5	Other species
8-C-dos	4AT	6.2	175	16.51	8	Other species
8-C-dos	5AT	6.35	195	24.25	16	Other species
8-C-dos	3AT	5.57	230	9.14	7	Other species
8-C-dos	2AT	4.35	303	26.03	21.5	Abies hickelii
8-N-uno	AR			20.32	16.5	Abies hickelii
8-N-uno	3AT	2.1	161	11.17	5.5	Other species
8-N-uno	5AT	6.55	242	16	9	Other species
8-N-uno	4AT	5.85	256	13.97	6	Other species
8-N-uno	2AT	2	289	19.55	20	Other species
8-N-uno	1AT	1.9	309	34.03	20	Other species
8-N-dos	AR			10.41	7.5	Abies hickelii
8-N-dos	2AT	4.7	114	13.71	9	Other species
8-N-dos	3AT	5.3	130	62.35	32.4	Other species
8-N-dos	1AT	3.1	196	72.13	36	Other species
8-240-uno	AR			42.92	21	Abies hickelii

8-240-uno	3AT	5.35	148	45.97	37.1	Other species
8-240-uno	1AT	2.95	200	36.32	17.5	Abies hickelii
8-240-uno	2AT	3.15	230	13.97	7	Other species
8-240-dos	AR			12.19	8.4	Abies hickelii
8-240-dos	4AT	6.6	17	45.97	37.1	Other species
8-240-dos	2AT	3.8	49	14.35	5	Other species
8-240-dos	1AT	3.6	105	63.37	36.2	Other species
8-240-dos	5AT	7	133	49.78	35.4	Other species
8-240-dos	3AT	4.2	196	29.97	25	Other species
7-C-uno	AR			20.57	22.5	Abies hickelii
7-C-uno	3AT	2.79	53	15.11	12	Other species
7-C-uno	1AT	1.9	117	11.93	9	Other species
7-C-uno	4AT	4.1	118	15.49	17.5	Abies hickelii
7-C-uno	5AT	5.46	272	81.28	43	Other species
7-C-uno	2AT	2.7	351	13.2	11.5	Other species
C-7-dos	AR			11.43	9.5	Abies hickelii
C-7-dos	5AT	3.55	36	10.41	8	Other species
C-7-dos	3AT	2.5	73	7.87	8.5	Other species
C-7-dos	4AT	2.5	172	9.39	11	Other species
C-7-dos	1AT	1.41	259	88.39	46	Other species
C-7-dos	2AT	2.23	345	13.97	15	Abies hickelii
7-N-uno	AR			9.22	7	Abies hickelii
7-N-uno	2AT	3	0	9.77	7	Other species
7-N-uno	1AT	1.25	20	12.82	13.5	Other species
7-N-uno	5AT	4.5	108	11.17	9	Other species
7-N-uno	4AT	4.35	203	13.33	9.5	Other species
7-N-uno	3AT	3.22	292	10.41	8	Other species
7-120-uno	AR			34.41	14.5	Abies hickelii
7-120-uno	1AT	4.9	152	45.97	23	Other species
7-120-uno	4AT	7.15	245	19.43	9.5	Other species
7-120-uno	2AT	5	250	42.16	20.5	Other species
7-120-uno	5AT	7.2	264	8.12	6	Other species
7-120-uno	3AT	6.8	321	46.48	26.5	Other species
7-240-uno	AR			52.07	26	Abies hickelii
7-240-uno	2AT	2.3	50	12.95	7.5	Other species
7-240-uno	5AT	2.73	205	8.63	10	Other species
7-240-uno	3AT	2.45	245	19.55	18.5	Other species
7-240-uno	4AT	2.5	288	32.89	15.5	Other species
7-240-uno	1AT	1.65	348	7.62	8	Other species
7-240-dos	AR			17.01	14	Abies hickelii
7-240-dos	4AT	3.55	0	12.19	8	Other species
7-240-dos	3AT	2.95	5	7.62	8	Other species
7-240-dos	5AT	4.8	47	19.55	18.5	Other species

7-240-dos	1AT	1.7	238	10.28	14	Other species
7-240-dos	2AT	2.51	243	57.91	25	Other species
6-C-uno	AR			10.66	7.5	Abies hickelii
6-C-uno	2AT	2.4	1	20.06	17.5	Other species
6-C-uno	1AT	1.95	1	37.84	19	Other species
6-C-uno	3AT	3.6	64	24.63	19	Other species
6-C-uno	4AT	3.64	74	13.71	13	Other species
6-C-uno	5AT	3.9	270	20.06	17	Other species
6-120-uno	AR			14.47	11.5	Abies hickelii
6-120-uno	4AT	5.2	142	9.77	7	Other species
6-120-uno	2AT	3.55	184	72.64	26	Other species
6-120-uno	3AT	3.6	192	44.83	25	Other species
6-120-uno	1AT	2.44	307	42.41	26.5	Other species
5-C-uno	AR			14.47	14	Abies hickelii
5-C-uno	1AT	2.3	30	50.03	25.5	Other species
5-C-uno	5AT	5.75	88	11.3	9.5	Other species
5-C-uno	3AT	4.9	228	56.38	28	Other species
5-C-uno	2AT	3.2	245	25.4	14	Other species
5-C-uno	4AT	4.86	309	58.67	26.5	Other species
5-N-uno	AR			28.06	19	Abies hickelii
5-N-uno	5AT	4.65	221	11.93	10.5	Other species
5-N-uno	3AT	3.35	224	17.78	14	Other species
5-N-uno	2AT	1.71	311	11.68	9.5	Other species
5-N-uno	1AT	1.6	327	18.54	14	Other species
5-N-uno	4AT	3.7	328	9.14	8	Other species
4-C-uno	AR			55.11	38	Abies hickelii
4-C-uno	1AT	1.41	91	9.27	9.5	Abies hickelii
4-C-uno	5AT	2.65	170	9.14	8.5	Abies hickelii
4-C-uno	4AT	2.3	183	8.5	8.5	Abies hickelii
4-C-uno	3AT	2.1	230	44.7	27	Other species
4-C-uno	2AT	2	282	10.66	10	Abies hickelii
4-C-dos	AR			7.5	10	Abies hickelii
4-C-dos	5AT	3.5	35	9.39	8.5	Abies hickelii
4-C-dos	2AT	2	172	10.41	10	Abies hickelii
4-C-dos	4AT	2.6	189	9.9	9	Abies hickelii
4-C-dos	3AT	2.15	296	8.38	9.5	Abies hickelii
4-C-dos	1AT	1.35	327	7.87	9.5	Abies hickelii
4-120-uno	AR			75.05	42.5	Abies hickelii
4-120-uno	1AT	1.4	19	1.66	7.5	Abies hickelii
4-120-uno	2AT	2.15	62	8.5	6	Abies hickelii
4-120-uno	5AT	4.8	99	11.48	10	Abies hickelii
4-120-uno	3AT	2.5	115	9.9	6.5	Abies hickelii
4-120-uno	4AT	2.85	292	9.14	7	Other species

4-120-dos	AR			7.87	7	Abies hickelii
4-120-dos	3AT	4.55	102	10.66	7.5	Abies hickelii
4-120-dos	2AT	4.2	118	75.05	42.5	Abies hickelii
4-120-dos	1AT	2.35	163	9.14	7	Abies hickelii
4-240-uno	AR			44.95	25	Abies hickelii
4-240-uno	3AT	4.6	115	13.2	10.5	Abies hickelii
4-240-uno	5AT	5.1	118	55.88	34	Other species
4-240-uno	2AT	4.2	121	57.4	26	Other species
4-240-uno	4AT	4.85	168	51.3	25.5	Other species
4-240-uno	1AT	2.3	314	12.57	5.6	Other species
4-240-dos	AR			8.12	8.5	Abies hickelii
4-240-dos	2AT	2.42	1	17.9	15	Abies hickelii
4-240-dos	4AT	2.75	78	17.9	13	Abies hickelii
4-240-dos	5AT	3	106	80.51	25	Other species
4-240-dos	1AT	0.2	125	14.6	13.5	Abies hickelii
4-240-dos	3AT	2.45	206	13.33	10.5	Abies hickelii
3-C-uno	AR			30.22	20	Abies hickelii
3-C-uno	3AT	4.8	115	21.33	17	Other species
3-C-uno	2AT	3.8	165	17.78	16	Abies hickelii
3-C-uno	1AT	3.63	198	37.84	27	Other species
3-C-uno	4AT	6.65	216	10.41	11	Other species
3-C-uno	5AT	6.9	280	48	29	Other species
3-C-dos	AR			8.25	8.5	Abies hickelii
3-C-dos	5AT	4.39	2	57.4	30	Other species
3-C-dos	2AT	1.94	33	25.4	12	Other species
3-C-dos	3AT	2.25	195	53.08	28	Other species
3-C-dos	4AT	3.15	277	18.03	15	Abies hickelii
3-C-dos	1AT	1.21	347	9.14	7	Abies hickelii
3-N-uno	AR			61.97	37.5	Abies hickelii
3-N-uno	2AT	2.62	134	9.39	7	Abies hickelii
3-N-uno	5AT	4.5	149	11.93	8.5	Abies hickelii
3-N-uno	3AT	3.5	167	10.41	9.5	Abies hickelii
3-N-uno	1AT	2.53	220	9.65	9	Abies hickelii
3-N-uno	4AT	4.3	278	13.97	10.5	Abies hickelii
3-N-dos	AR			7.62	9	Abies hickelii
3-N-dos	4AT	1.93	3	17.78	13.5	Abies hickelii
3-N-dos	2AT	1.7	162	15.49	13	Abies hickelii
3-N-dos	3AT	1.56	214	9.14	8.5	Abies hickelii
3-N-dos	1AT	1.26	267	49.4	35	Other species
3-N-dos	5AT	2.26	336	8.5	10.5	Abies hickelii
3-120-uno	AR			7.62	9	Abies hickelii
3-120-uno	4AT	1.93	3	17.78	13.5	Abies hickelii
3-120-uno	3AT	1.7	162	15.49	13	Abies hickelii

3-120-uno	2AT	1.56	214	9.14	8.5	Abies hickelii
3-120-uno	1AT	1.26	267	49.4	35	Other species
3-120-uno	5AT	2.26	336	8.5	10.5	Abies hickelii
3-120-dos	AR			8.35	7.5	Abies hickelii
3-120-dos	1AT	1.75	5	34.54	30	Other species
3-120-dos	3AT	3.45	87	11.93	15	Abies hickelii
3-120-dos	2AT	3.3	198	19.05	18	Other species
3-120-dos	5AT	4.33	209	37.33	20	Other species
3-120-dos	4AT	4.25	337	44.7	25	Other species
3-240-uno	AR			8.35	7.5	Abies hickelii
3-240-uno	1AT	1.75	5	34.54	30	Other species
3-240-uno	2AT	3.45	87	11.93	15	Abies hickelii
3-240-uno	3AT	3.3	198	19.05	18	Other species
3-240-uno	5AT	4.33	209	37.33	20	Other species
3-240-uno	4AT	4.25	337	44.7	25	Other species
3-240-dos	AR			8.38	8.5	Abies hickelii
3-240-dos	1AT	1.43	122	12.44	9.5	Abies hickelii
3-240-dos	4AT	2.8	136	14.47	10.5	Other species
3-240-dos	3AT	1.93	223	9.52	8	Abies hickelii
3-240-dos	5AT	3.65	278	8.5	5.5	Other species
3-240-dos	2AT	1.82	314	7.62	5.5	Other species
2-C-uno	AR			32.51	24	Abies hickelii
2-C-uno	1AT	1.6	62	8.76	4.4	Other species
2-C-uno	2AT	2.5	163	14.17	17	Abies hickelii
2-C-uno	4AT	4.75	299	14.17	9.5	Other species
2-C-uno	3AT	4.6	316	21.08	7	Other species
2-C-dos	AR			10.41	12.5	Abies hickelii
2-C-dos	1AT	1.8	55	16.25	15.5	Abies hickelii
2-C-dos	3AT	2.12	96	13.71	14	Abies hickelii
2-C-dos	5AT	5.12	174	10.41	10.5	Other species
2-C-dos	4AT	4.46	226	31.75	25.5	Other species
2-C-dos	2AT	1.91	345	45.08	33.6	Other species
2-N-uno	AR			54.1	40	Abies hickelii
2-N-uno	4AT	5.2	10	33.52	12	Other species
2-N-uno	3AT	2.8	95	9.39	7.5	Other species
2-N-uno	1AT	0.8	112	29.46	20.5	Abies hickelii
2-N-uno	2AT	2.65	320	13.2	12	Abies hickelii
2-N-dos	AR			13.2	12	Abies hickelii
2-N-dos	3AT	3.6	38	33.52	12	Other species
2-N-dos	4AT	5.2	116	9.39	7.5	Other species
2-N-dos	2AT	3.56	128	29.46	20.5	Abies hickelii
2-N-dos	1AT	2.5	140	54.1	40	Abies hickelii
2-120-uno	AR			53.08	28	Abies hickelii

2-120-uno	5AT	3.75	49	39.87	25	Abies hickelii
2-120-uno	3AT	3.35	169	37.59	24.5	Abies hickelii
2-120-uno	2AT	2.2	174	14.78	13.5	Other species
2-120-uno	4AT	3.6	256	38.1	26	Abies hickelii
2-120-uno	1AT	0.96	356	14.35	14	Other species
2-120-dos	AR			16.89	15.5	Abies hickelii
2-120-dos	2AT	4.47	46	14.73	12.5	Other species
2-120-dos	3AT	5.95	292	63.75	34	Other species
2-120-dos	1AT	4.32	358	34.72	20.5	Abies hickelii
2-240-uno	AR			24.89	16.7	Abies hickelii
2-240-uno	1AT	3.4	23	119.6	35	Other species
2-240-uno	3AT	5.45	204	9.39	10	Other species
2-240-uno	2AT	3.8	233	7.5	4.1	Other species
2-240-uno	4AT	5.9	333	10.41	5.6	Other species
2-240-dos	AR			7.5	4.45	Abies hickelii
2-240-dos	3AT	3.37	175	14.22	10	Other species
2-240-dos	1AT	2.95	340	8.38	6.3	Other species
2-240-dos	2AT	3	350	10.92	6.5	Other species
1-C-uno	AR			59.43	37	Abies hickelii
1-C-uno	1AT	2.35	76	27.88	20.5	Other species
1-C-uno	4AT	3.6	123	10.41	7.5	Other species
1-C-uno	5AT	4.25	189	18.54	16	Other species
1-C-uno	3AT	3.4	206	22.6	20	Abies hickelii
1-C-uno	2AT	2.75	298	13.46	16	Abies hickelii
1-C-dos	AR			7.62	8	Abies hickelii
1-C-dos	3AT	2.9	38	12.44	12	Other species
1-C-dos	4AT	3.3	105	7.82	9.5	Abies hickelii
1-C-dos	1AT	0.74	269	10.1	11.5	Other species
1-C-dos	5AT	3.54	281	10.41	11.5	Abies hickelii
1-C-dos	2AT	1.2	344	59.94	34.5	Other species
1-N-uno	AR			62.48	37	Abies hickelii
1-N-uno	1AT	2.61	59	10.41	14	Abies hickelii
1-N-uno	4AT	3.24	102	49.02	34	Other species
1-N-uno	5AT	3.31	210	32.63	31	Abies hickelii
1-N-uno	3AT	3.17	257	8.38	8	Other species
1-N-uno	2AT	3	304	12.14	9.5	Other species
1-N-dos	AR			10.41	14	Abies hickelii
1-N-dos	1AT	1.75	1	16.76	12	Other species
1-N-dos	4AT	3.3	106	10.92	11	Other species
1-N-dos	2AT	2.34	142	49.02	34	Other species
1-N-dos	3AT	2.6	228	62.48	37	Abies hickelii
1-N-dos	5AT	3.97	294	62.73	36	Other species
1-N-dos	AR			10.41	14	Abies hickelii

1-N-dos	1AT	1.75	1	16.76	12	Other species
1-N-dos	4AT	3.3	106	10.92	11	Other species
1-N-dos	2AT	2.34	142	49.02	34	Other species
1-N-dos	3AT	2.6	228	62.48	37	Abies hickelii
1-N-dos	5AT	3.97	294	62.73	36	Other species
1-120-uno	AR			42.72	25.5	Abies hickelii
1-120-uno	2AT	3.55	22	9.77	9	Other species
1-120-uno	1AT	2.37	108	11.45	12	Other species
1-120-uno	4AT	4.81	117	25.9	21.5	Abies hickelii
1-120-uno	5AT	6	162	33.4	29	Other species
1-120-uno	3AT	3.62	175	38.98	28	Other species
1-120-dos	AR			10.41	14.5	Abies hickelii
1-120-dos	4AT	2.77	246	26.92	25.5	Other species
1-120-dos	5AT	3.2	287	16.51	22.5	Other species
1-120-dos	3AT	1.7	322	9.39	12.5	Other species
1-120-dos	1AT	1.53	328	14.09	14.5	Other species
1-120-dos	2AT	1.7	351	17.52	20.5	Other species
1-240-uno	AR			39.57	29.5	Abies hickelii
1-240-uno	1AT	1.6	3	59.64	29.5	Other species
1-240-uno	2AT	2.77	129	13.2	12	Other species
1-240-uno	3AT	2.81	280	55.37	30	Other species
1-240-uno	4AT	3.4	291	13.51	20	Abies hickelii
1-240-dos	AR			7.62	7.5	Abies hickelii
1-240-dos	3AT	3.36	91	10.16	11.5	Abies hickelii
1-240-dos	1AT	0.5	175	25.4	24	Other species
1-240-dos	4AT	3.75	187	42.67	28.5	Other species
1-240-dos	5AT	4.27	196	19.81	14.5	Other species
1-240-dos	2AT	1.4	351	7.87	9	Abies hickelii