

Supplementary Material

Effects of Demographic History on the Detection of Recombination Hotspots from Linkage Disequilibrium

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Control Simulations

Table S1: Power to detect hotspots in control simulations that vary in population mutation rate (θ) and the length of the simulated scaffold.

<i>theta</i>	300-kb	450-kb	500-kb	600-kb
0.001	0.804	0.845	0.720	0.833
0.0005	0.745	0.759	–	0.735
0.0001	–	0.308	–	0.277

Table S2: Frequency of false positives (per *Mb*) in control simulations that vary in the population mutation rate (θ) and the length of the simulated scaffold.

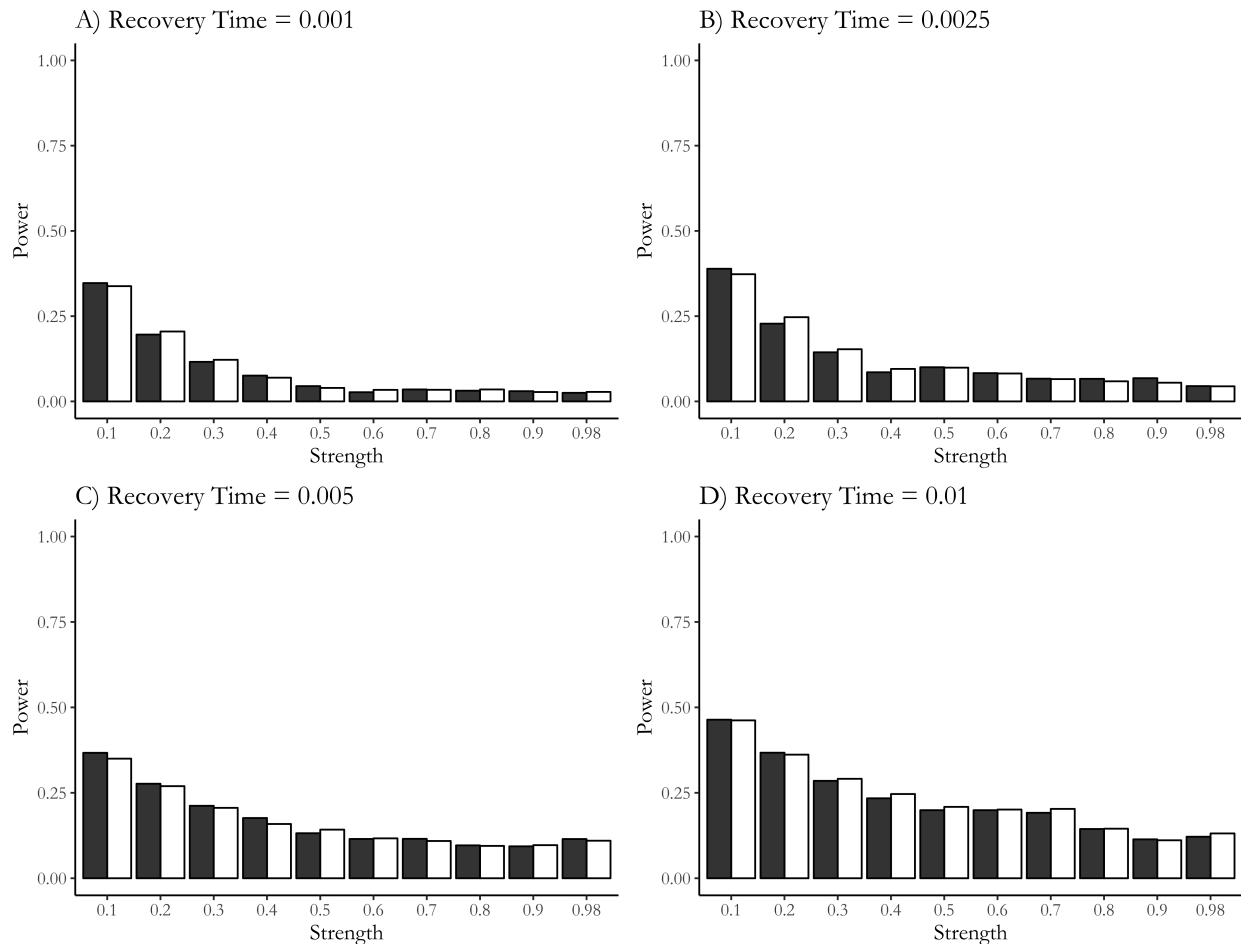
<i>theta</i>	300-kb	450-kb	500-kb	600-kb
0.001	0.261	0.330	0.160	0.318
0.0005	0.219	0.280	–	0.259
0.0001	–	0.151	–	0.185

Singletons

Singletons are not informative for measurements of linkage disequilibrium and should be filtered out before applying *LD*-based methods for estimating recombination rate and identifying recombination hotspots. To determine the effect of the inclusion of singletons on the identification of recombination hotspots, we measured the power of *LDhat/LDhot* to detect a $16 \rho/kb$ hotspot both before (white) and after (black) singletons were removed from the simulated samples. Following population contractions and population bottlenecks, we observed only minor decreases in the power to detect recombination hotspots in the presences of singletons. However, the inclusion of singletons resulted in significant decreases in the power to detect hotspots following population expansions. These results suggest that the failure to remove singletons prior to analysis will disproportionately reduce performance in populations that have experienced expansions.

In some cases, after singletons were removed, the samples no longer contained enough SNPs to measure linkage disequilibrium (> 100 SNPs) in *LDhat*. These samples were excluded from our analyses. Additionally, the coalescent simulator *msHOT* assumes an infinite alleles model when assigning positions to SNPs (Hudson 2001). As such, given a finite chromosome size, it was unavoidable, but infrequent, that two SNPs fall within a single base pair position. These sites were also filtered out, along with singletons. However, these sites were not excluded in the pre-filtered data. Rather, they were assumed to occur in directly adjacent genomic positions. As such, this difference could also contribute to the variation in power we observe, in addition to the inclusion of singletons. However, the very low frequency of such SNPs in the simulated samples makes it very unlikely that they contribute to observable differences in performance.

Figure S1: Instantaneous Bottleneck



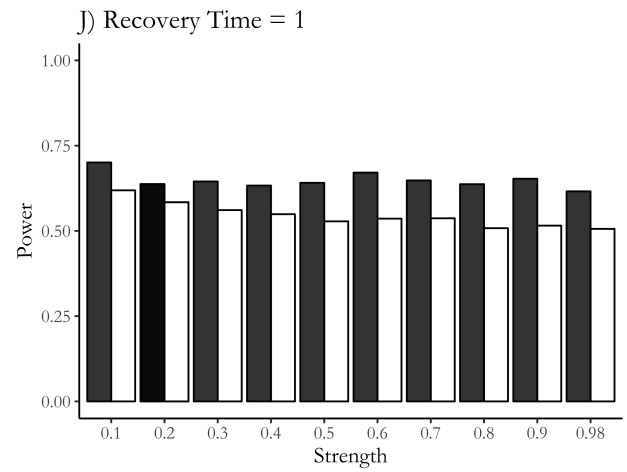
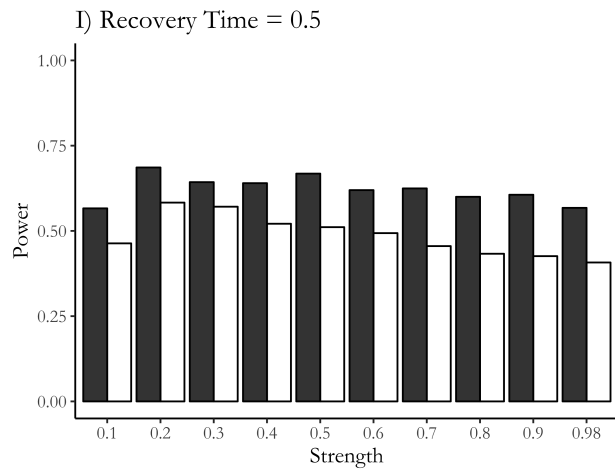
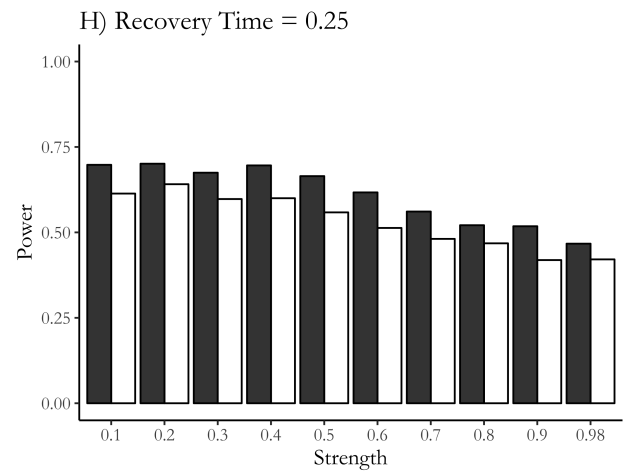
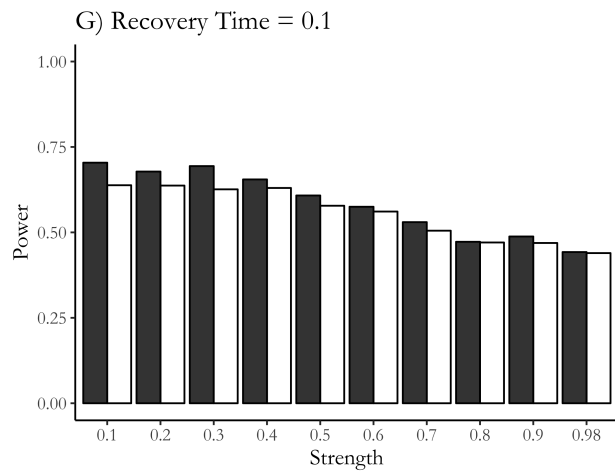
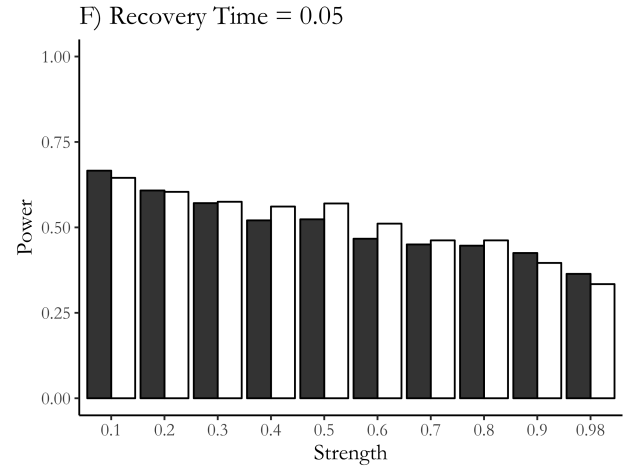
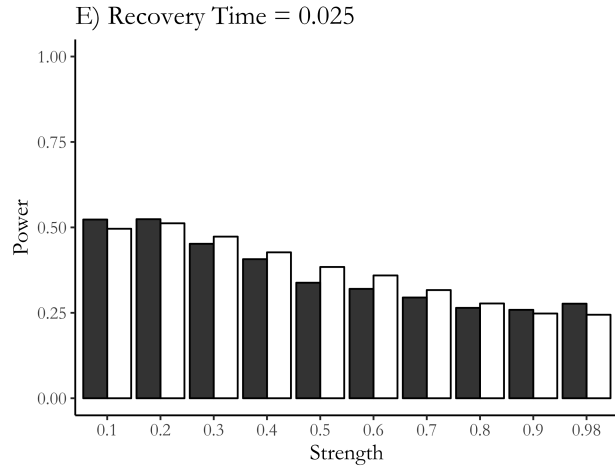
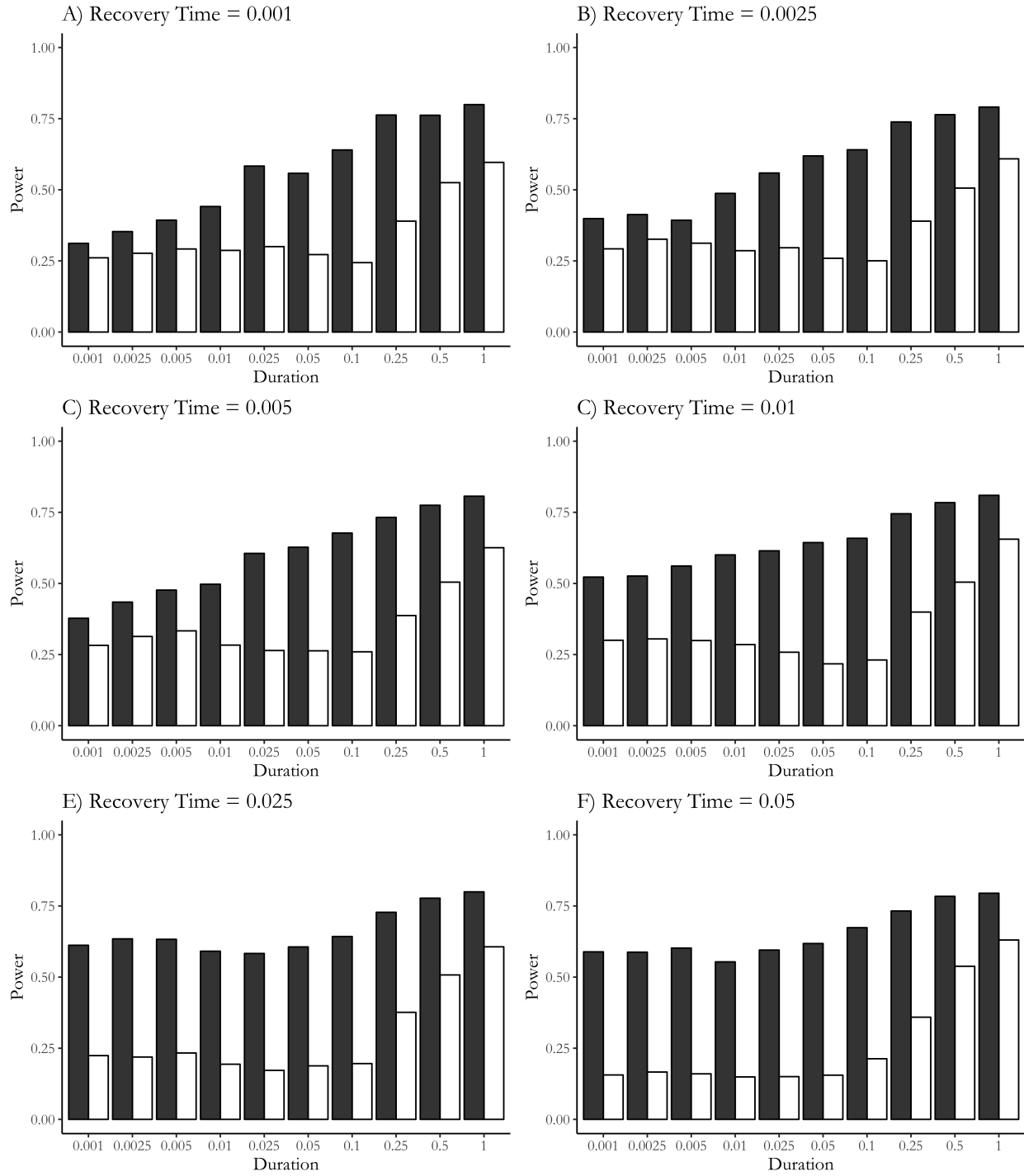


Figure S2: Exponential Expansion



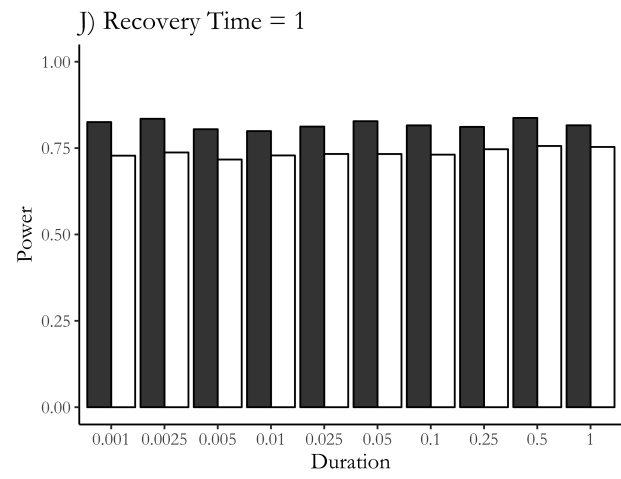
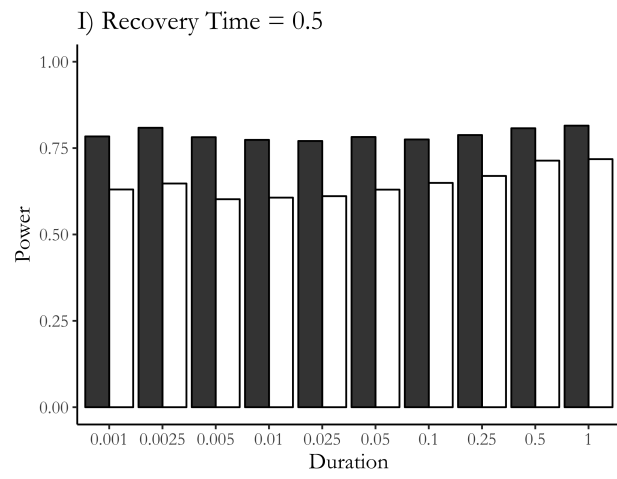
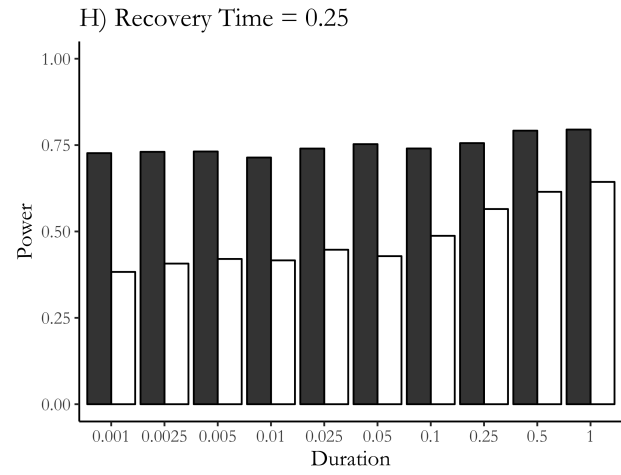
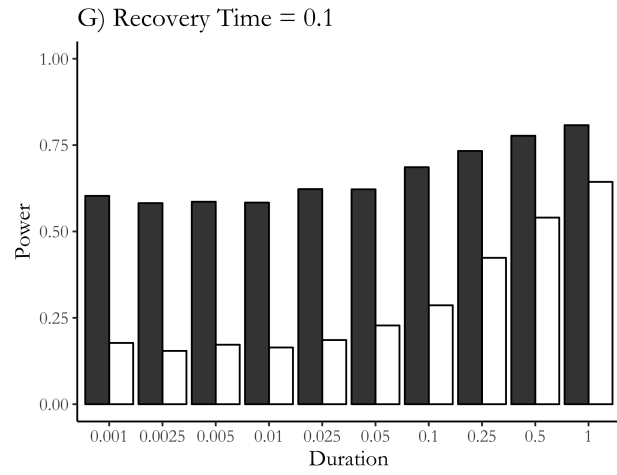
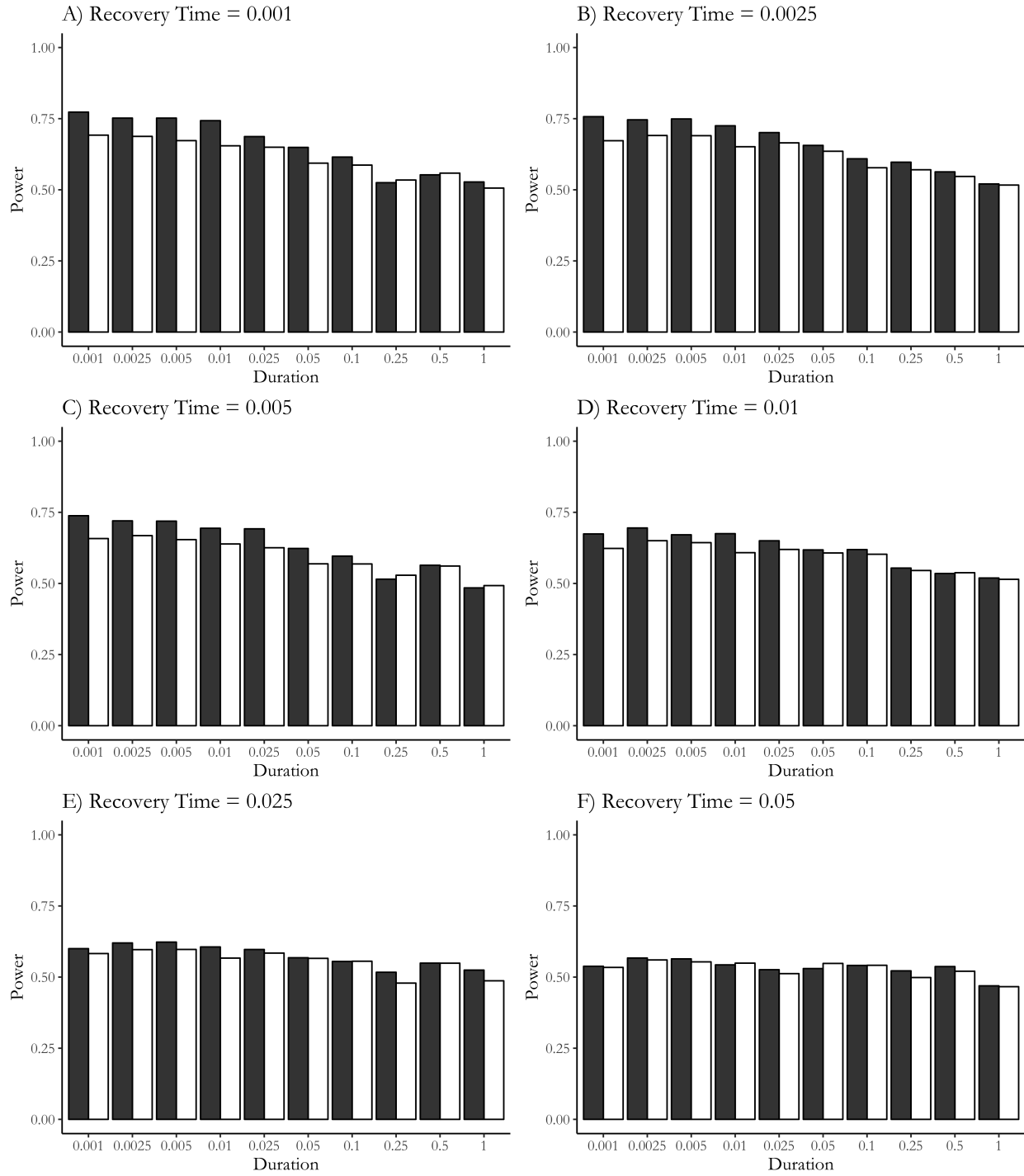


Figure S3: Exponential Contraction



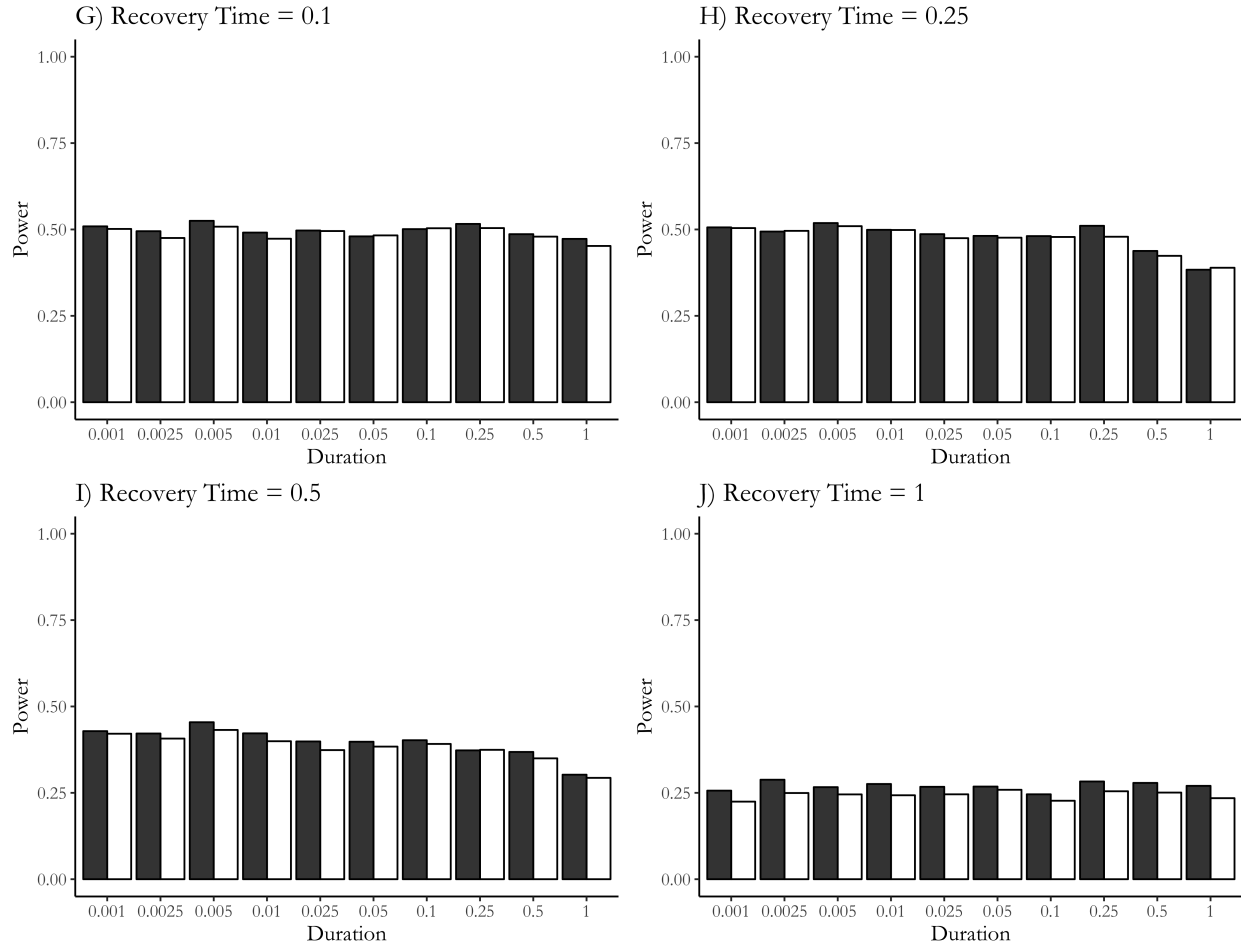
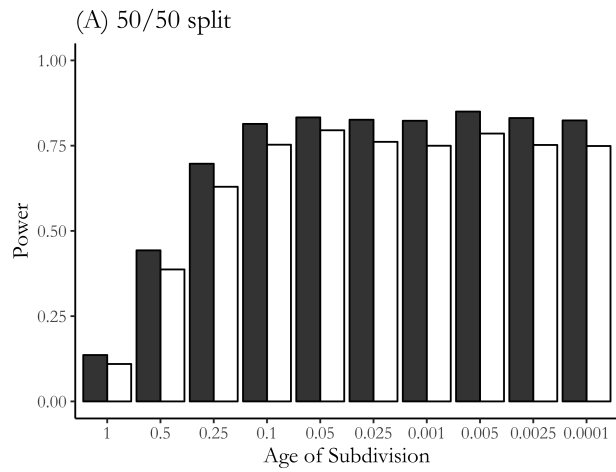


Figure S4: Hidden Population Subdivision



Correlation Between Genomic Parameters & Performance

Can performance be predicted by simple genomics parameters? Here we plot two measures of performance (power and false positives per Mb) against four genomic parameters related to linkage disequilibrium and demography: the average number of segregating sites (S) (A), the average number of pairwise differences (π) (B), Tajima's D (C), and the number of singletons (D). Each point represents the average value of the genomic parameter across all replicates in one of the 100 demographic condition (or 10 in the case of population subdivision) simulated for each type of demographic event: instantaneous bottlenecks (red), exponential expansions (teal), exponential contractions (yellow), and hidden population subdivision (orange)(Figure S5-S7). Across all conditions, power is calculated as the fraction of simulations in which the 16 ρ/kb is identified as statistically significant at a threshold of $p < 0.001$ and the background recombination rate is $0.02 \rho/kb$ (Figure S5-S7).

To identify how variation in recombination rate alters the correlation between these genomic parameter and performance, we also separately analyzed the contraction data in which background recombination rate and the intensity of the recombination hotspot varies. Each point represents the average value of the genomic parameter across all replicates simulated for each type of contraction event: background - $0.02 \rho/kb$, hotspot - $16 \rho/kb$ (red), background - $0.2 \rho/kb$, hotspot - $16 \rho/kb$ (teal), background - $0.2 \rho/kb$, hotspot - $160 \rho/kb$ (yellow)(Figure S8,S9).

Figure S5: Components of Tajima's D for each demographic conditions simulated.

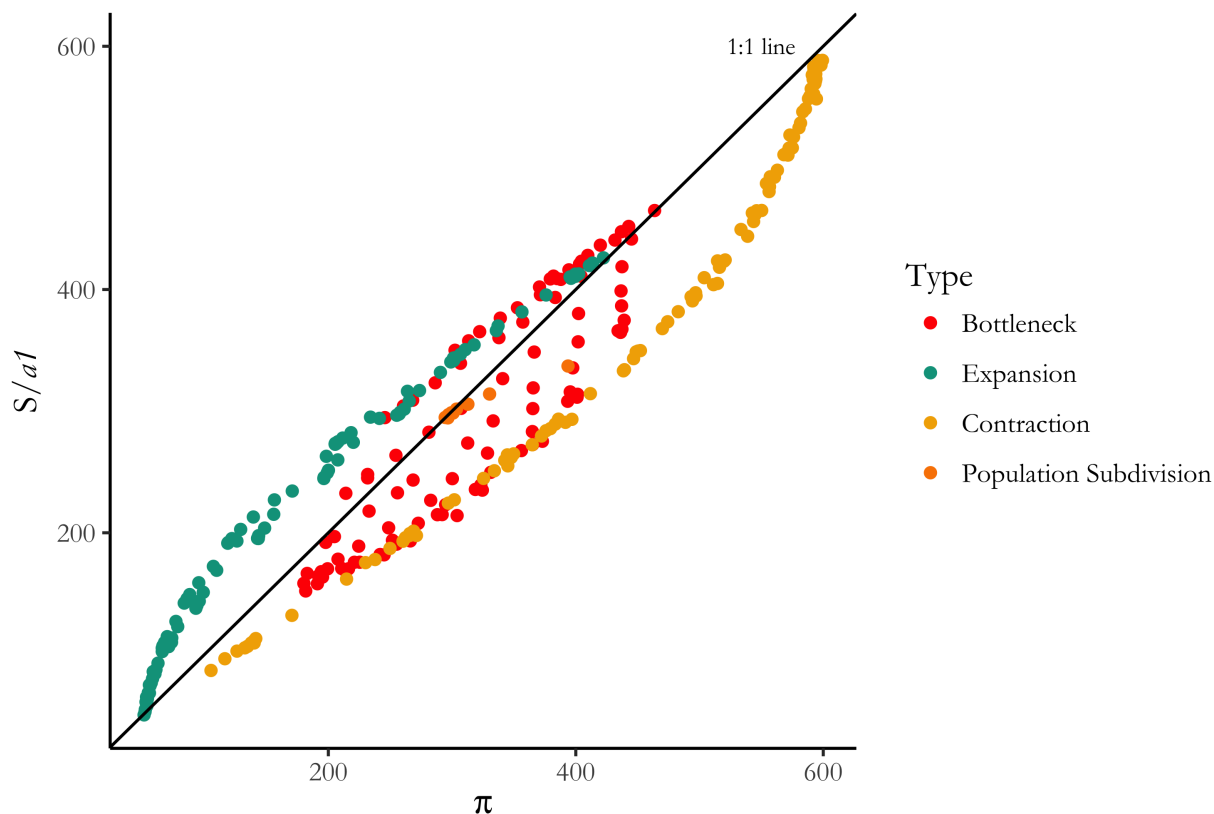


Figure S6: All Conditions - Power

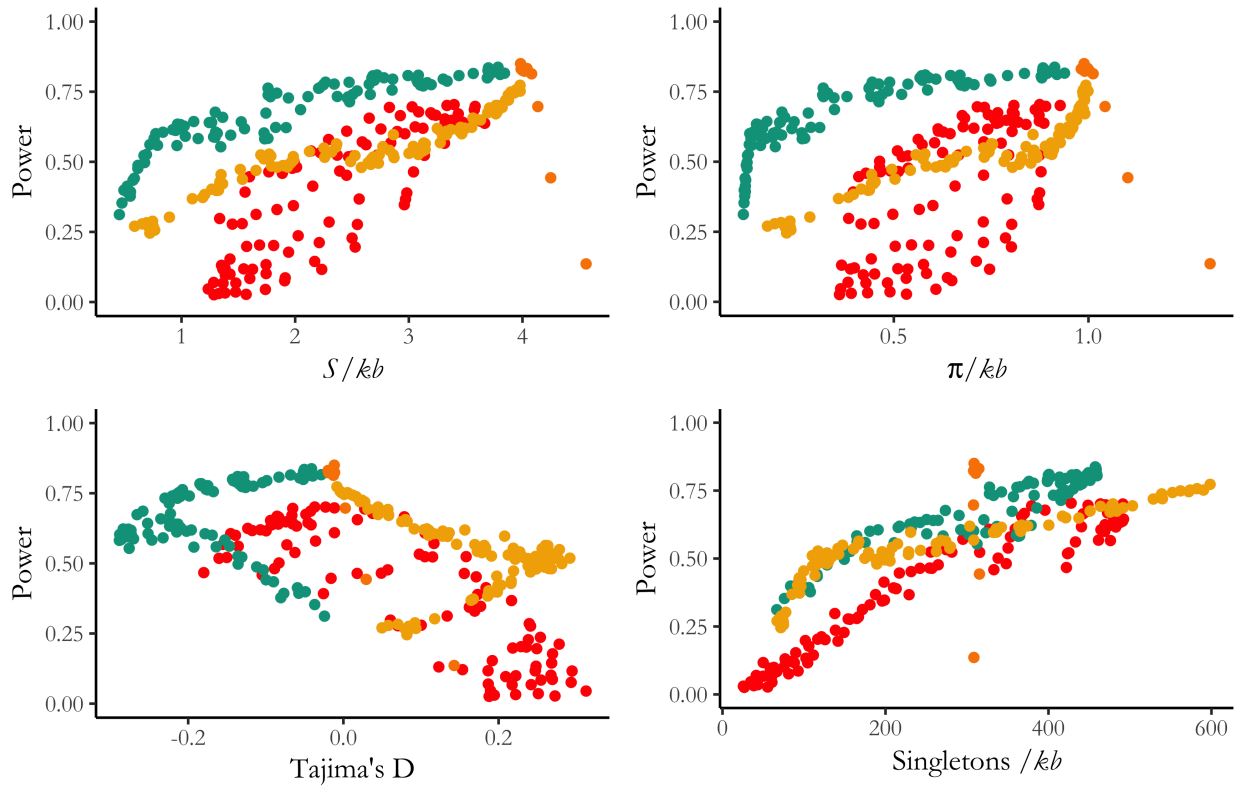


Figure S7: All Conditions - False Positives

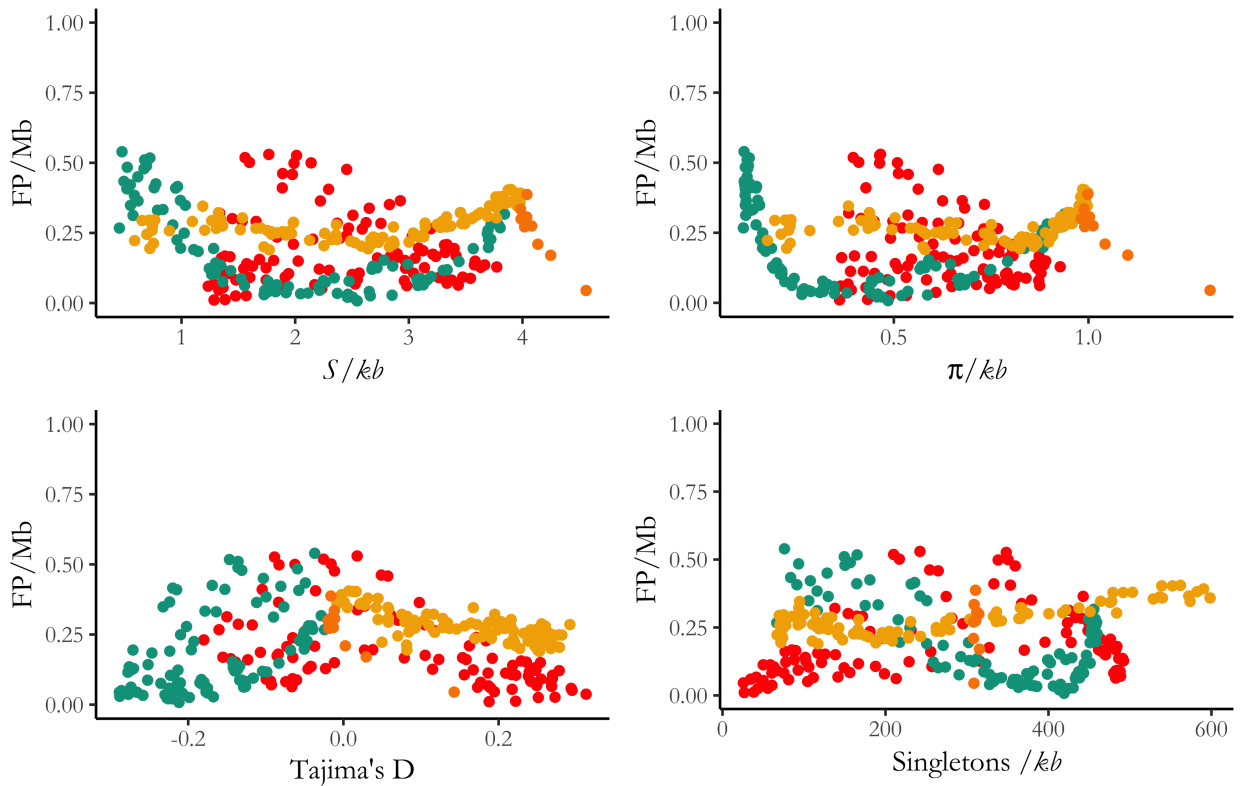


Figure S8: Exponential Contractions - Power

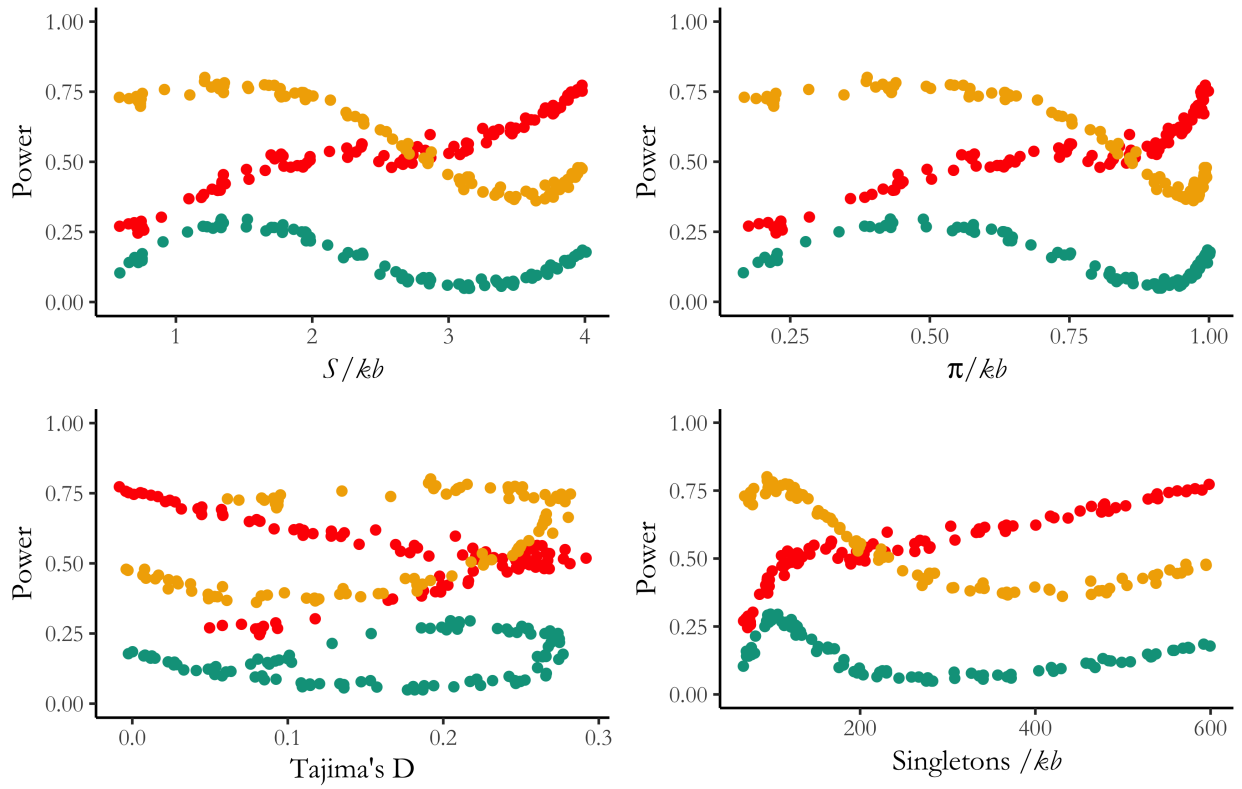
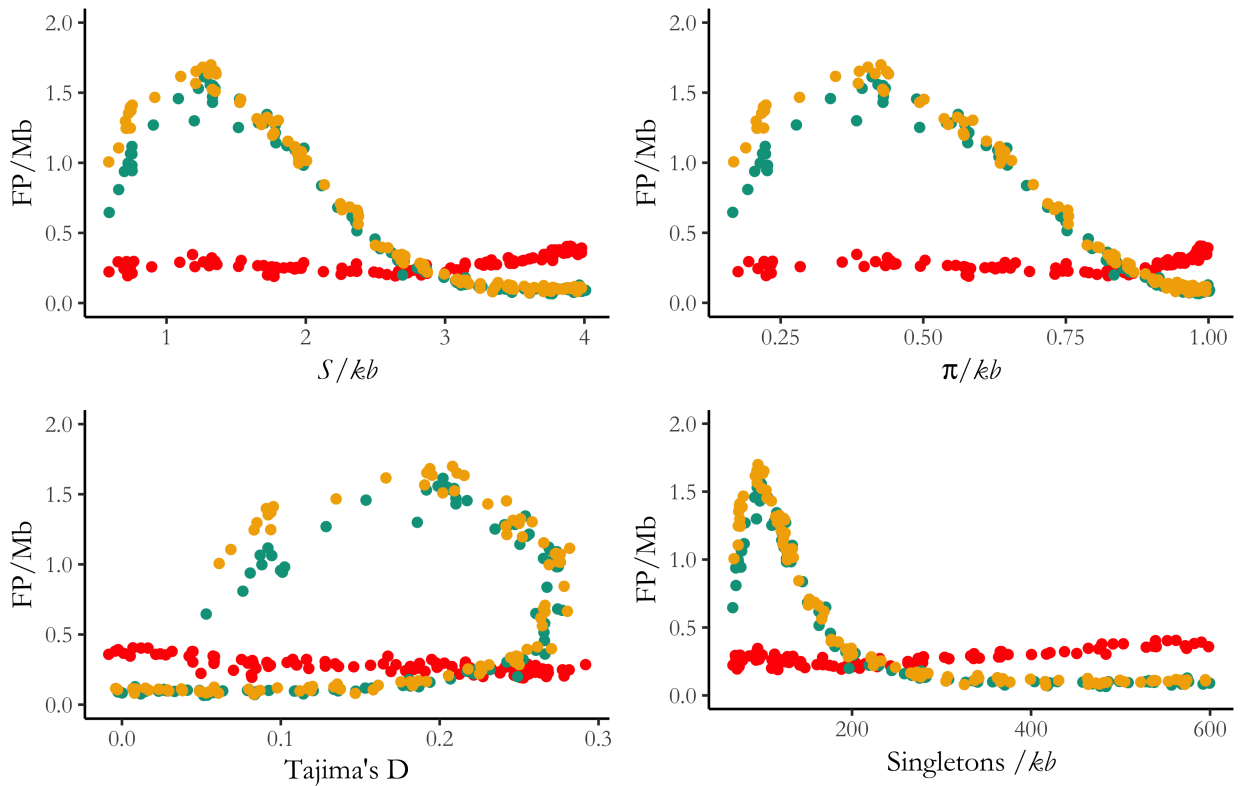


Figure S9: Exponential Contractions - False Positives



Window Size & Performance

LDhot compares the estimated recombination rate at local maxima to the background recombination rate to statistically validate potential hotspots. By default, *LDhot* (2014) compares each local maxima to a 100-*kb* background window (grey). However, the size of the background window specified has been shown to alter performance of LD-based programs (Wall & Stevison 2016). To determine how background window size may affect performance of *LDhot* in cases of non-equilibrium demographic histories, we chose a subset of demographic conditions and re-ran LDhot analyses with two additional background window sizes (50-*kb* (black) and 200-*kb* (white)). We focused our analyses on a subset of instantaneous bottlenecks and population contractions that were selected in order to maximize the range of variation in performance covered.

Figure S10: The effect of background window size on the power of LDhot to identify recombination hotspots (16 ρ/kb hotspot, 0.02 ρ/kb background) following instantaneous bottlenecks.

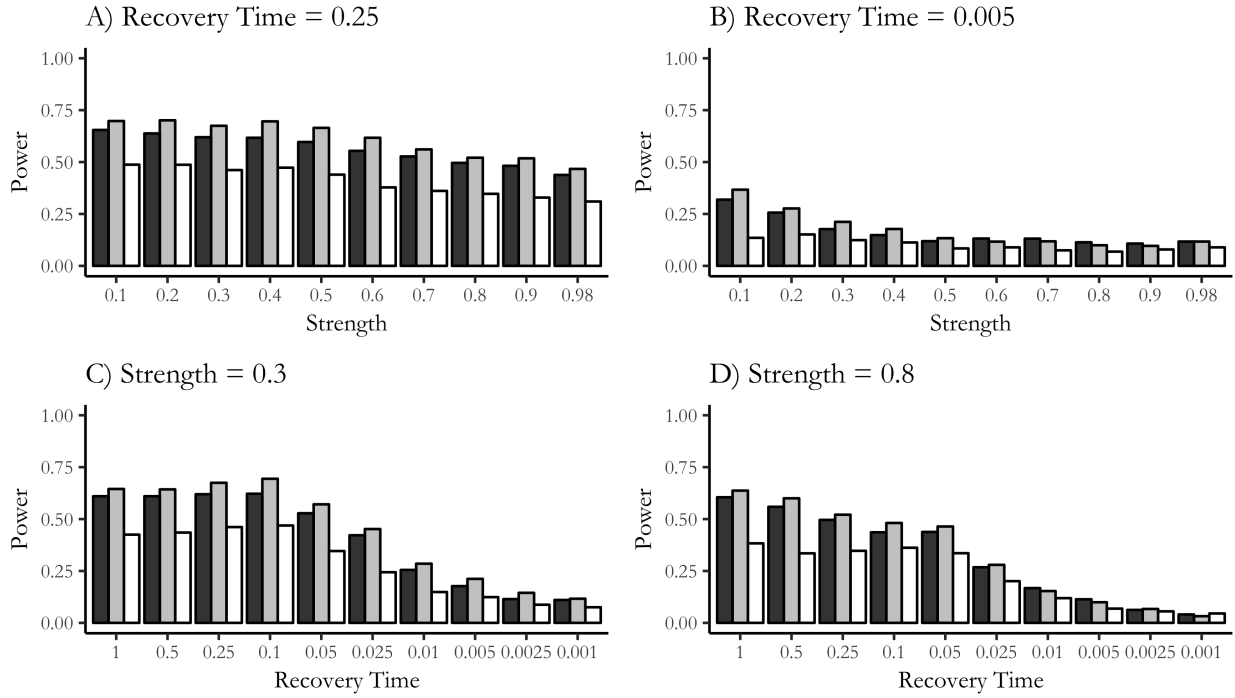


Figure S11: The effect of background window size on the frequency of false positives following instantaneous bottlenecks.

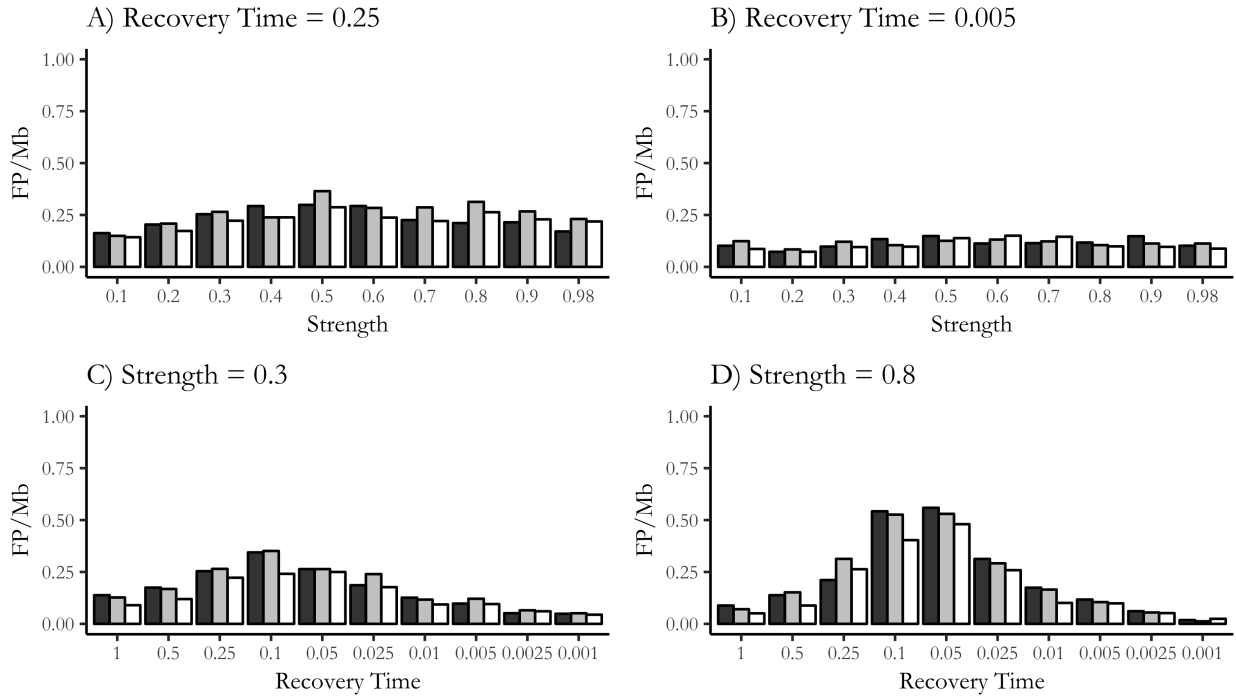


Figure S12: The effect of background window size on the power of LDhot to identify recombination hotspots ($16 \rho/kb$, $0.2 \rho/kb$ background) following population contractions.

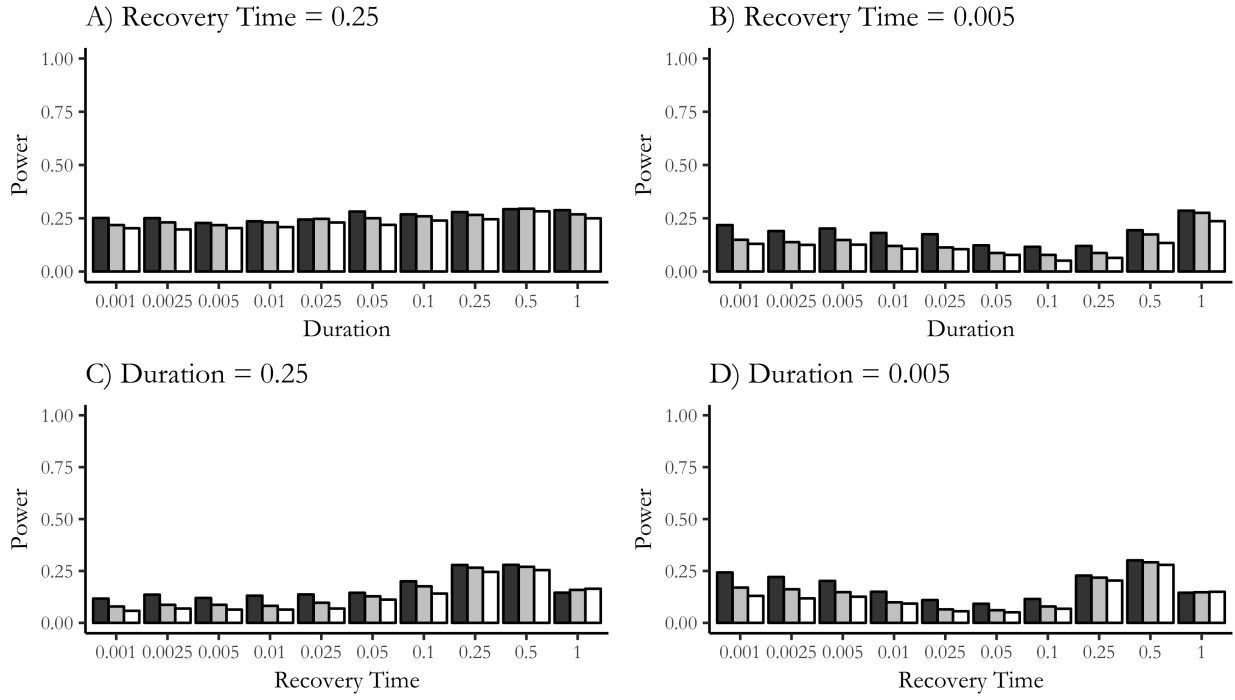


Figure S13: The effect of background window size on the frequency of false positives following population contractions.

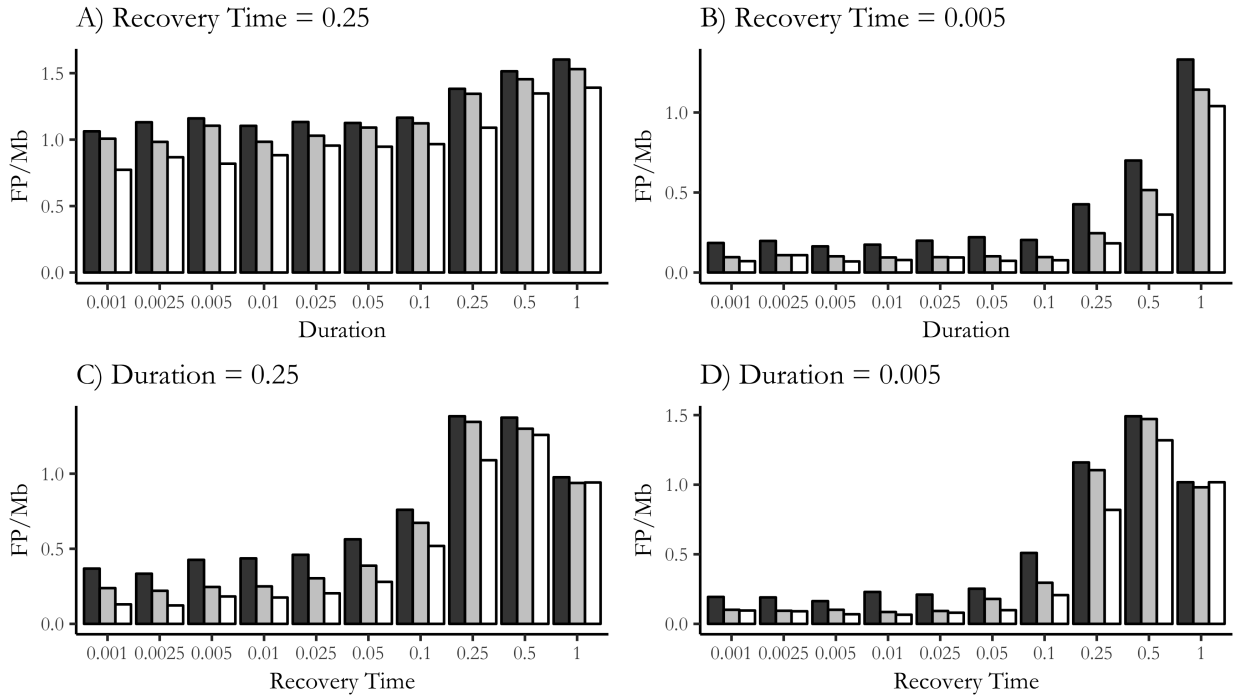


Table S3: Instantaneous Bottleneck - Summary Statistics

<i>Condition</i>	<i>Strength</i>	<i>Time</i>	<i>N</i>	<i>Power</i>	<i>FP/Mb</i>	<i>S</i>	<i>Pi</i>	<i>D</i>	<i>Singletons</i>
0	0.1	1	1000	0.701	0.129	1395.496	463.698	-0.023	491.302
1	0.2	1	1000	0.637	0.136	1342.791	442.785	-0.042	490.929
2	0.3	1	1000	0.645	0.127	1323.939	436.875	-0.046	492.134
3	0.4	1	1000	0.633	0.088	1283.199	419.848	-0.060	487.963
4	0.5	1	1000	0.641	0.092	1252.406	409.697	-0.066	484.758
5	0.6	1	1000	0.671	0.064	1235.133	404.562	-0.066	482.469
6	0.7	1	1000	0.648	0.082	1208.753	394.439	-0.074	480.100
7	0.8	1	1000	0.637	0.071	1179.388	381.998	-0.093	488.508
8	0.9	1	1000	0.653	0.084	1175.923	379.401	-0.094	482.695
9	0.98	1	1000	0.616	0.091	1148.972	370.667	-0.100	482.653
10	0.1	0.5	999	0.566	0.207	1181.004	387.902	-0.073	476.040
11	0.2	0.5	1000	0.686	0.136	1302.016	431.640	-0.042	486.231
12	0.3	0.5	1000	0.643	0.168	1225.500	402.991	-0.065	482.510
13	0.4	0.5	1000	0.640	0.180	1175.689	384.912	-0.084	484.001
14	0.5	0.5	1000	0.668	0.174	1133.271	371.405	-0.085	472.495
15	0.6	0.5	999	0.620	0.186	1089.071	352.845	-0.107	473.180
16	0.7	0.5	999	0.625	0.160	1058.344	338.990	-0.123	469.420
17	0.8	0.5	1000	0.600	0.152	1013.583	322.316	-0.139	469.041
18	0.9	0.5	1000	0.606	0.164	987.708	313.419	-0.145	464.369
19	0.98	0.5	999	0.568	0.169	959.167	302.386	-0.155	461.398
20	0.1	0.25	999	0.698	0.149	1321.595	445.037	-0.012	470.123
21	0.2	0.25	1000	0.701	0.208	1203.950	404.212	-0.037	463.755
22	0.3	0.25	999	0.675	0.265	1146.960	383.400	-0.048	449.707
23	0.4	0.25	1000	0.696	0.238	1066.142	357.189	-0.065	448.520
24	0.5	0.25	999	0.665	0.365	1020.022	337.874	-0.083	442.593
25	0.6	0.25	1000	0.617	0.284	936.641	306.806	-0.117	440.494
26	0.7	0.25	1000	0.561	0.287	878.827	286.377	-0.135	433.155
27	0.8	0.25	1000	0.521	0.313	828.804	268.154	-0.150	425.064
28	0.9	0.25	1000	0.518	0.267	811.377	260.745	-0.160	423.344
29	0.98	0.25	1000	0.467	0.231	773.884	245.720	-0.180	422.038
30	0.1	0.1	1000	0.704	0.195	1271.509	437.329	0.027	427.809
31	0.2	0.1	1000	0.678	0.196	1147.410	402.228	0.038	395.747
32	0.3	0.1	1000	0.694	0.351	1035.254	366.396	0.027	379.319
33	0.4	0.1	999	0.656	0.338	958.765	340.907	0.018	367.078
34	0.5	0.1	997	0.609	0.476	867.460	307.279	-0.012	359.199
35	0.6	0.1	997	0.580	0.406	793.798	281.279	-0.036	353.343
36	0.7	0.1	995	0.539	0.500	719.604	254.633	-0.062	350.423
37	0.8	0.1	997	0.481	0.526	658.009	231.780	-0.089	348.185
38	0.9	0.1	997	0.502	0.498	656.595	231.748	-0.083	338.208
39	0.98	0.1	993	0.459	0.411	610.337	214.148	-0.105	333.016
40	0.1	0.05	1000	0.666	0.166	1248.146	436.566	0.078	370.353
41	0.2	0.05	1000	0.608	0.176	1121.498	401.902	0.105	327.228
42	0.3	0.05	998	0.571	0.264	1000.089	365.568	0.117	294.953
43	0.4	0.05	979	0.524	0.284	900.928	333.205	0.105	281.438
44	0.5	0.05	968	0.533	0.364	834.405	312.642	0.098	274.484
45	0.6	0.05	911	0.477	0.458	717.769	268.491	0.057	264.737
46	0.7	0.05	881	0.465	0.462	680.342	255.883	0.049	254.240
47	0.8	0.05	827	0.464	0.530	619.694	232.924	0.018	242.261
48	0.9	0.05	754	0.447	0.501	543.834	204.929	-0.016	217.028
49	0.98	0.05	741	0.392	0.519	531.217	197.888	-0.026	209.968
50	0.1	0.025	1000	0.523	0.126	1253.147	437.015	0.115	315.547

<i>Condition</i>	<i>Strength</i>	<i>Time</i>	<i>N</i>	<i>Power</i>	<i>FP/Mb</i>	<i>S</i>	<i>Pi</i>	<i>D</i>	<i>Singletons</i>
51	0.2	0.025	1000	0.524	0.161	1106.287	397.547	0.158	255.537
52	0.3	0.025	964	0.452	0.240	994.513	365.279	0.171	231.456
53	0.4	0.025	932	0.413	0.228	879.222	328.665	0.184	198.181
54	0.5	0.025	871	0.344	0.210	790.413	300.221	0.162	195.981
55	0.6	0.025	808	0.330	0.235	733.236	282.746	0.169	181.009
56	0.7	0.025	714	0.312	0.291	640.554	248.737	0.134	171.737
57	0.8	0.025	651	0.279	0.292	583.686	224.552	0.100	164.733
58	0.9	0.025	596	0.278	0.301	539.107	207.827	0.070	154.190
59	0.98	0.025	526	0.298	0.320	487.808	192.009	0.061	137.837
60	0.1	0.01	1000	0.464	0.106	1263.757	439.114	0.156	256.956
61	0.2	0.01	982	0.367	0.107	1093.813	395.517	0.217	187.799
62	0.3	0.01	945	0.285	0.117	982.487	364.915	0.240	166.832
63	0.4	0.01	887	0.236	0.150	873.556	331.306	0.254	138.549
64	0.5	0.01	784	0.202	0.152	772.823	294.786	0.236	125.875
65	0.6	0.01	742	0.203	0.156	708.138	272.696	0.229	116.841
66	0.7	0.01	655	0.198	0.140	649.579	251.818	0.218	101.620
67	0.8	0.01	566	0.153	0.165	565.476	221.059	0.192	89.841
68	0.9	0.01	507	0.121	0.167	516.896	199.392	0.154	85.115
69	0.98	0.01	476	0.131	0.161	473.442	182.943	0.123	76.767
70	0.1	0.005	997	0.367	0.124	1256.583	434.169	0.167	228.969
71	0.2	0.005	981	0.277	0.084	1117.459	401.424	0.241	156.235
72	0.3	0.005	942	0.212	0.121	984.519	365.169	0.278	121.425
73	0.4	0.005	836	0.178	0.105	863.258	323.264	0.270	105.926
74	0.5	0.005	737	0.133	0.126	763.346	288.149	0.248	102.347
75	0.6	0.005	673	0.117	0.131	702.732	267.946	0.247	88.146
76	0.7	0.005	596	0.118	0.123	665.807	255.152	0.247	77.667
77	0.8	0.005	527	0.099	0.105	579.532	225.358	0.222	63.076
78	0.9	0.005	486	0.096	0.112	541.621	210.821	0.209	58.534
79	0.98	0.005	418	0.117	0.112	498.530	194.343	0.186	49.948
80	0.1	0.0025	1000	0.389	0.062	1277.994	437.307	0.173	213.121
81	0.2	0.0025	967	0.228	0.102	1101.285	393.447	0.238	149.127
82	0.3	0.0025	926	0.145	0.065	974.361	356.033	0.268	111.501
83	0.4	0.0025	826	0.086	0.093	861.047	318.819	0.269	92.786
84	0.5	0.0025	740	0.101	0.082	780.705	291.988	0.267	75.430
85	0.6	0.0025	655	0.084	0.091	710.222	265.860	0.255	66.662
86	0.7	0.0025	570	0.068	0.082	638.199	241.824	0.242	60.522
87	0.8	0.0025	501	0.067	0.055	565.482	214.177	0.217	49.810
88	0.9	0.0025	413	0.070	0.067	501.293	191.177	0.187	41.356
89	0.98	0.0025	392	0.047	0.060	474.242	181.715	0.190	34.677
90	0.1	0.001	996	0.347	0.079	1281.527	436.192	0.177	198.714
91	0.2	0.001	985	0.196	0.068	1122.235	401.044	0.249	141.691
92	0.3	0.001	929	0.116	0.051	1012.406	373.004	0.295	104.499
93	0.4	0.001	814	0.076	0.058	871.779	324.475	0.293	81.140
94	0.5	0.001	771	0.045	0.037	802.337	304.062	0.313	60.694
95	0.6	0.001	651	0.027	0.026	712.129	266.263	0.273	55.489
96	0.7	0.001	601	0.036	0.025	657.540	245.060	0.251	43.279
97	0.8	0.001	513	0.032	0.012	584.425	216.321	0.222	38.440
98	0.9	0.001	442	0.030	0.046	534.912	195.339	0.194	25.588
99	0.98	0.001	411	0.026	0.011	479.066	180.213	0.188	26.689

Table S4: Exponential Expansion - Summary Statistics

<i>Cond1</i>	<i>Cond2</i>	<i>Duration</i>	<i>Time</i>	<i>N</i>	<i>Power</i>	<i>FP/Mb</i>	<i>S</i>	<i>Pi</i>	<i>D</i>	<i>Singletons</i>
0	0	0.001	0.001	981	0.312	26.000	149.848	51.079	-0.024	66.574
0	1	0.0025	0.001	993	0.353	53.000	150.818	51.849	-0.037	75.970
0	2	0.005	0.001	1000	0.393	43.000	153.842	53.278	-0.057	91.202
0	3	0.01	0.001	1000	0.441	45.000	156.118	53.090	-0.100	116.030
0	4	0.025	0.001	999	0.583	70.000	178.485	59.896	-0.153	164.708
0	5	0.05	0.001	999	0.558	52.000	221.200	70.966	-0.193	210.596
0	6	0.1	0.001	1000	0.640	36.000	301.015	92.961	-0.213	258.590
0	7	0.25	0.001	998	0.763	14.000	464.322	143.395	-0.207	327.680
0	8	0.5	0.001	998	0.762	22.000	630.612	196.367	-0.175	361.230
0	9	1	0.001	991	0.799	47.000	799.869	255.272	-0.140	402.329
1	0	0.001	0.0025	995	0.399	43.000	151.314	52.073	-0.049	83.565
1	1	0.0025	0.0025	999	0.413	52.000	153.408	53.379	-0.059	93.370
1	2	0.005	0.0025	999	0.393	37.000	151.581	53.305	-0.077	105.910
1	3	0.01	0.0025	1000	0.487	43.000	156.983	54.474	-0.112	129.725
1	4	0.025	0.0025	999	0.559	58.000	181.204	60.692	-0.164	175.112
1	5	0.05	0.0025	999	0.619	47.000	228.968	73.263	-0.196	217.283
1	6	0.1	0.0025	998	0.641	30.000	304.505	93.783	-0.219	264.640
1	7	0.25	0.0025	998	0.738	27.000	464.838	142.799	-0.210	327.586
1	8	0.5	0.0025	998	0.764	17.000	630.513	196.550	-0.177	365.175
1	9	1	0.0025	997	0.791	51.000	812.692	257.977	-0.138	398.920
2	0	0.001	0.005	999	0.378	42.000	149.521	52.635	-0.081	107.786
2	1	0.0025	0.005	998	0.434	33.000	152.330	53.769	-0.090	116.239
2	2	0.005	0.005	999	0.477	53.000	156.392	55.412	-0.103	128.369
2	3	0.01	0.005	999	0.497	67.000	159.372	55.379	-0.136	149.410
2	4	0.025	0.005	999	0.606	62.000	185.905	62.335	-0.178	190.949
2	5	0.05	0.005	999	0.627	60.000	230.641	73.460	-0.210	229.986
2	6	0.1	0.005	997	0.677	31.000	309.745	95.675	-0.223	273.511
2	7	0.25	0.005	997	0.732	18.000	468.815	143.666	-0.214	332.641
2	8	0.5	0.005	995	0.775	30.000	637.369	199.154	-0.180	373.337
2	9	1	0.005	991	0.807	51.000	806.239	257.226	-0.137	399.861
3	0	0.001	0.01	999	0.522	59.000	157.388	55.923	-0.131	150.240
3	1	0.0025	0.01	1000	0.526	64.000	159.089	56.895	-0.136	156.839
3	2	0.005	0.01	999	0.561	72.000	163.819	57.912	-0.147	165.170
3	3	0.01	0.01	1000	0.600	66.000	169.271	58.461	-0.169	180.808
3	4	0.025	0.01	999	0.615	57.000	199.855	65.769	-0.202	215.515
3	5	0.05	0.01	998	0.644	49.000	247.876	78.264	-0.224	250.446
3	6	0.1	0.01	1000	0.659	23.000	322.448	98.916	-0.235	290.297
3	7	0.25	0.01	999	0.745	23.000	484.311	148.504	-0.216	342.372
3	8	0.5	0.01	995	0.784	28.000	643.113	200.078	-0.183	376.133
3	9	1	0.01	990	0.810	49.000	821.794	261.334	-0.136	400.672
4	0	0.001	0.025	1000	0.612	81.000	195.624	65.760	-0.215	231.515
4	1	0.0025	0.025	1000	0.634	85.000	198.961	66.262	-0.220	235.820
4	2	0.005	0.025	999	0.633	77.000	203.366	67.688	-0.224	242.416
4	3	0.01	0.025	996	0.591	78.000	214.291	69.805	-0.232	250.659
4	4	0.025	0.025	999	0.583	47.000	244.970	76.827	-0.247	270.732
4	5	0.05	0.025	1000	0.606	41.000	292.269	89.451	-0.252	292.364
4	6	0.1	0.025	1000	0.643	28.000	365.439	109.762	-0.252	320.698
4	7	0.25	0.025	997	0.728	21.000	515.576	155.871	-0.225	357.035
4	8	0.5	0.025	997	0.777	34.000	672.156	207.661	-0.183	381.529
4	9	1	0.025	996	0.800	60.000	836.255	265.382	-0.143	413.615
5	0	0.001	0.05	1000	0.589	54.000	274.890	83.534	-0.271	301.938

<i>Cond1</i>	<i>Cond2</i>	<i>Duration</i>	<i>Time</i>	<i>N</i>	<i>Power</i>	<i>FP/Mb</i>	<i>S</i>	<i>Pi</i>	<i>D</i>	<i>Singletons</i>
5	1	0.0025	0.05	998	0.588	36.000	279.700	84.848	-0.270	303.011
5	2	0.005	0.05	1000	0.602	35.000	283.112	85.863	-0.273	308.212
5	3	0.01	0.05	999	0.554	39.000	292.811	87.981	-0.276	312.406
5	4	0.025	0.05	999	0.595	35.000	321.392	95.290	-0.278	323.170
5	5	0.05	0.05	998	0.618	20.000	362.468	107.101	-0.274	336.713
5	6	0.1	0.05	1000	0.674	15.000	428.522	126.105	-0.266	355.279
5	7	0.25	0.05	997	0.732	13.000	567.644	170.855	-0.230	382.435
5	8	0.5	0.05	998	0.784	30.000	713.533	220.187	-0.185	398.671
5	9	1	0.05	993	0.795	52.000	863.246	273.702	-0.142	421.216
6	0	0.001	0.1	998	0.603	10.000	413.230	118.717	-0.288	363.097
6	1	0.0025	0.1	998	0.582	15.000	415.543	119.063	-0.289	363.191
6	2	0.005	0.1	999	0.586	17.000	425.040	121.162	-0.286	360.511
6	3	0.01	0.1	999	0.584	15.000	427.139	122.057	-0.287	364.630
6	4	0.025	0.1	996	0.623	14.000	452.727	129.153	-0.284	369.624
6	5	0.05	0.1	996	0.622	13.000	484.962	139.395	-0.277	378.735
6	6	0.1	0.1	999	0.686	12.000	535.011	156.410	-0.258	385.610
6	7	0.25	0.1	996	0.733	13.000	659.698	198.398	-0.221	406.052
6	8	0.5	0.1	996	0.777	16.000	777.098	241.287	-0.175	414.708
6	9	1	0.1	993	0.808	55.000	915.888	290.595	-0.134	428.684
7	0	0.001	0.25	995	0.727	8.000	692.569	205.502	-0.226	413.288
7	1	0.0025	0.25	995	0.730	12.000	694.434	206.339	-0.225	413.687
7	2	0.005	0.25	999	0.731	9.000	691.391	205.605	-0.227	417.380
7	3	0.01	0.25	992	0.714	9.000	699.011	207.797	-0.224	415.276
7	4	0.025	0.25	993	0.740	8.000	711.107	211.604	-0.221	415.258
7	5	0.05	0.25	994	0.753	3.000	725.168	218.364	-0.212	419.162
7	6	0.1	0.25	993	0.740	10.000	771.600	234.098	-0.199	424.499
7	7	0.25	0.25	993	0.756	11.000	851.643	263.963	-0.168	430.213
7	8	0.5	0.25	989	0.792	34.000	938.334	298.981	-0.132	441.073
7	9	1	0.25	990	0.795	47.000	1039.657	335.786	-0.099	443.972
8	0	0.001	0.5	987	0.784	25.000	950.371	300.987	-0.129	433.005
8	1	0.0025	0.5	990	0.809	29.000	951.446	301.509	-0.128	434.149
8	2	0.005	0.5	990	0.782	35.000	951.852	301.139	-0.134	440.551
8	3	0.01	0.5	994	0.774	35.000	956.332	302.528	-0.131	437.093
8	4	0.025	0.5	992	0.771	26.000	966.555	306.787	-0.126	438.236
8	5	0.05	0.5	994	0.782	33.000	977.244	310.628	-0.126	443.061
8	6	0.1	0.5	995	0.775	38.000	995.191	317.790	-0.116	441.082
8	7	0.25	0.5	989	0.788	48.000	1047.554	337.187	-0.104	451.177
8	8	0.5	0.5	985	0.807	60.000	1098.943	356.478	-0.083	446.658
8	9	1	0.5	986	0.815	79.000	1150.766	376.001	-0.068	450.974
9	0	0.001	1	993	0.825	106.000	1201.619	396.950	-0.051	457.989
9	1	0.0025	1	986	0.835	81.000	1203.353	397.494	-0.050	458.085
9	2	0.005	1	989	0.805	93.000	1202.062	395.365	-0.056	459.625
9	3	0.01	1	988	0.799	101.000	1204.043	396.103	-0.052	452.959
9	4	0.025	1	985	0.812	93.000	1210.918	399.572	-0.047	452.253
9	5	0.05	1	992	0.828	93.000	1212.315	399.589	-0.051	458.640
9	6	0.1	1	989	0.816	115.000	1222.604	402.419	-0.045	449.079
9	7	0.25	1	983	0.811	110.000	1248.516	413.558	-0.039	459.128
9	8	0.5	1	988	0.837	115.000	1241.813	410.938	-0.041	457.389
9	9	1	1	989	0.816	130.000	1269.051	422.358	-0.029	455.668

Table S5: Exponential Contraction - Summary Statistics

<i>Cond1</i>	<i>Cond2</i>	<i>Duration</i>	<i>Time</i>	<i>N</i>	<i>Power</i>	<i>FP/Mb</i>	<i>S</i>	<i>Pi</i>	<i>D</i>	<i>Singletons</i>
0	0	0.001	0.001	971	0.773	201.000	1782.009	596.016	-0.008	598.338
0	1	0.0025	0.001	983	0.752	220.000	1790.600	599.350	-0.002	590.288
0	2	0.005	0.001	978	0.752	194.000	1791.398	598.170	0.005	573.744
0	3	0.01	0.001	970	0.743	226.000	1783.566	593.936	0.012	552.222
0	4	0.025	0.001	976	0.687	212.000	1776.834	592.282	0.044	491.619
0	5	0.05	0.001	977	0.649	180.000	1735.096	581.636	0.075	437.360
0	6	0.1	0.001	985	0.615	153.000	1673.025	562.925	0.128	342.196
0	7	0.25	0.001	990	0.525	121.000	1484.331	519.833	0.221	228.457
0	8	0.5	0.001	990	0.553	129.000	1246.395	448.820	0.256	166.306
0	9	1	0.001	994	0.528	92.000	943.886	347.873	0.253	117.075
1	0	0.001	0.0025	974	0.757	214.000	1777.195	592.266	-0.004	582.295
1	1	0.0025	0.0025	980	0.746	205.000	1779.086	592.524	0.001	572.177
1	2	0.005	0.0025	978	0.749	227.000	1770.560	591.120	0.007	561.988
1	3	0.01	0.0025	981	0.725	203.000	1776.960	593.779	0.024	536.255
1	4	0.025	0.0025	973	0.701	212.000	1774.242	588.073	0.045	479.122
1	5	0.05	0.0025	982	0.656	170.000	1714.888	573.040	0.080	417.180
1	6	0.1	0.0025	994	0.609	151.000	1656.283	560.563	0.136	335.795
1	7	0.25	0.0025	994	0.597	149.000	1482.988	514.563	0.208	230.889
1	8	0.5	0.0025	991	0.563	120.000	1248.284	452.209	0.263	167.378
1	9	1	0.0025	993	0.521	123.000	941.660	344.712	0.233	128.343
2	0	0.001	0.005	976	0.738	226.000	1778.904	591.826	0.016	538.994
2	1	0.0025	0.005	979	0.720	201.000	1779.180	594.050	0.021	539.865
2	2	0.005	0.005	977	0.719	199.000	1775.269	593.286	0.028	528.617
2	3	0.01	0.005	980	0.694	213.000	1782.948	590.261	0.032	503.110
2	4	0.025	0.005	980	0.692	194.000	1755.301	585.585	0.057	463.977
2	5	0.05	0.005	979	0.623	168.000	1725.214	576.004	0.091	400.453
2	6	0.1	0.005	985	0.596	162.000	1638.752	554.065	0.134	332.465
2	7	0.25	0.005	987	0.515	116.000	1488.758	520.728	0.221	228.221
2	8	0.5	0.005	989	0.564	148.000	1246.875	450.319	0.260	167.088
2	9	1	0.005	995	0.484	120.000	956.300	349.784	0.247	118.574
3	0	0.001	0.01	979	0.674	170.000	1772.570	589.590	0.045	483.672
3	1	0.0025	0.01	972	0.695	194.000	1783.555	589.146	0.042	477.563
3	2	0.005	0.01	976	0.671	192.000	1776.999	594.464	0.058	475.510
3	3	0.01	0.01	980	0.675	173.000	1758.703	583.433	0.058	451.073
3	4	0.025	0.01	975	0.650	176.000	1735.496	580.399	0.082	421.176
3	5	0.05	0.01	980	0.618	158.000	1725.754	575.009	0.110	363.683
3	6	0.1	0.01	989	0.619	156.000	1640.729	556.216	0.156	303.388
3	7	0.25	0.01	990	0.554	128.000	1443.159	503.808	0.219	214.782
3	8	0.5	0.01	995	0.535	120.000	1228.195	446.685	0.268	160.790
3	9	1	0.01	995	0.519	125.000	924.077	342.596	0.246	128.940
4	0	0.001	0.025	985	0.600	158.000	1707.499	570.505	0.110	365.839
4	1	0.0025	0.025	984	0.620	168.000	1714.184	572.387	0.104	374.412
4	2	0.005	0.025	988	0.623	180.000	1699.642	568.213	0.108	366.963
4	3	0.01	0.025	974	0.606	180.000	1700.223	571.497	0.116	365.512
4	4	0.025	0.025	984	0.597	171.000	1657.198	557.190	0.128	336.273
4	5	0.05	0.025	988	0.568	150.000	1652.211	556.566	0.146	308.253
4	6	0.1	0.025	986	0.555	138.000	1555.761	533.527	0.183	262.361
4	7	0.25	0.025	994	0.517	128.000	1403.281	496.840	0.238	204.489
4	8	0.5	0.025	993	0.549	108.000	1201.634	438.467	0.278	147.324
4	9	1	0.025	998	0.525	128.000	901.221	334.181	0.248	117.969
5	0	0.001	0.05	985	0.538	134.000	1588.724	544.856	0.179	278.846

<i>Cond1</i>	<i>Cond2</i>	<i>Duration</i>	<i>Time</i>	<i>N</i>	<i>Power</i>	<i>FP/Mb</i>	<i>S</i>	<i>Pi</i>	<i>D</i>	<i>Singletons</i>
5	1	0.0025	0.05	987	0.567	131.000	1604.471	542.667	0.169	268.315
5	2	0.005	0.05	990	0.564	151.000	1607.578	550.223	0.181	273.902
5	3	0.01	0.05	989	0.543	158.000	1600.593	546.140	0.173	279.788
5	4	0.025	0.05	984	0.526	131.000	1582.129	543.706	0.191	262.455
5	5	0.05	0.05	989	0.530	120.000	1552.605	538.876	0.212	243.014
5	6	0.1	0.05	988	0.541	110.000	1484.014	516.131	0.227	208.401
5	7	0.25	0.05	989	0.522	116.000	1332.340	474.286	0.251	179.260
5	8	0.5	0.05	995	0.537	116.000	1130.905	411.783	0.266	141.655
5	9	1	0.05	995	0.469	125.000	881.647	325.465	0.241	112.623
6	0	0.001	0.1	993	0.509	114.000	1397.099	497.196	0.247	199.991
6	1	0.0025	0.1	993	0.495	118.000	1435.543	511.301	0.255	199.380
6	2	0.005	0.1	988	0.525	126.000	1442.947	514.522	0.260	195.829
6	3	0.01	0.1	989	0.491	123.000	1389.357	493.179	0.238	205.563
6	4	0.025	0.1	989	0.497	105.000	1392.728	494.276	0.251	188.105
6	5	0.05	0.1	990	0.480	110.000	1355.662	482.799	0.248	189.348
6	6	0.1	0.1	991	0.501	119.000	1314.197	469.954	0.257	174.636
6	7	0.25	0.1	992	0.516	131.000	1209.386	439.323	0.277	142.653
6	8	0.5	0.1	989	0.486	127.000	1011.885	372.273	0.265	121.707
6	9	1	0.1	995	0.473	116.000	804.869	296.994	0.219	110.572
7	0	0.001	0.25	992	0.506	145.000	1057.764	386.014	0.255	133.955
7	1	0.0025	0.25	994	0.494	125.000	1048.354	383.375	0.262	126.784
7	2	0.005	0.25	993	0.519	144.000	1061.523	396.867	0.292	127.765
7	3	0.01	0.25	991	0.499	124.000	1056.233	391.651	0.281	124.932
7	4	0.025	0.25	992	0.486	121.000	1021.393	375.902	0.259	129.727
7	5	0.05	0.25	989	0.481	126.000	1031.257	379.525	0.265	128.399
7	6	0.1	0.25	989	0.481	123.000	990.885	364.812	0.268	116.421
7	7	0.25	0.25	998	0.511	95.000	927.973	345.065	0.267	110.148
7	8	0.5	0.25	989	0.438	133.000	819.991	301.833	0.216	113.449
7	9	1	0.25	997	0.384	100.000	643.063	237.765	0.186	92.786
8	0	0.001	0.5	995	0.429	111.000	731.236	271.209	0.216	94.141
8	1	0.0025	0.5	990	0.422	112.000	742.402	268.845	0.199	93.880
8	2	0.005	0.5	993	0.454	120.000	726.304	265.844	0.198	99.658
8	3	0.01	0.5	989	0.422	118.000	720.782	265.527	0.203	96.362
8	4	0.025	0.5	990	0.399	129.000	721.762	262.302	0.195	93.550
8	5	0.05	0.5	990	0.398	104.000	705.564	260.328	0.198	96.192
8	6	0.1	0.5	991	0.402	115.000	682.435	249.822	0.187	92.164
8	7	0.25	0.5	988	0.373	128.000	633.223	230.060	0.167	94.553
8	8	0.5	0.5	992	0.368	103.000	586.151	214.727	0.165	85.222
8	9	1	0.5	992	0.303	80.000	472.909	170.570	0.118	77.599
9	0	0.001	1	993	0.256	82.000	397.969	141.365	0.083	74.822
9	1	0.0025	1	998	0.288	75.000	386.456	139.918	0.092	71.941
9	2	0.005	1	990	0.266	79.000	368.073	132.513	0.079	74.637
9	3	0.01	1	996	0.276	71.000	387.652	137.700	0.084	70.288
9	4	0.025	1	993	0.267	58.000	392.158	140.071	0.081	73.820
9	5	0.05	1	989	0.268	77.000	386.737	140.049	0.093	72.245
9	6	0.1	1	995	0.246	53.000	375.988	134.746	0.082	71.574
9	7	0.25	1	990	0.283	65.000	353.475	126.172	0.070	73.821
9	8	0.5	1	993	0.279	76.000	333.033	116.391	0.058	69.521
9	9	1	1	989	0.270	55.000	297.717	105.190	0.050	66.935

Table S6: Hidden Population Subdivision - Summary Statistics

<i>Cond</i>	<i>Time</i>	<i>Split</i>	<i>Migration</i>	<i>N</i>	<i>Power</i>	<i>FP/Mb</i>	<i>S</i>	<i>Pi</i>	<i>D</i>	<i>Singletons</i>
0	0.001	16/16	0	1000	0.136	0.045	1367.902	393.730	0.143	308.498
1	0.0025	16/16	0	1000	0.443	0.170	1274.549	330.321	0.029	315.286
2	0.005	16/16	0	1000	0.697	0.210	1240.588	312.791	0.002	308.006
3	0.01	16/16	0	999	0.814	0.275	1224.130	303.590	-0.013	310.829
4	0.025	16/16	0	999	0.833	0.387	1211.869	299.425	-0.016	310.488
5	0.05	16/16	0	1000	0.826	0.307	1200.023	296.376	-0.017	311.923
6	0.1	16/16	0	1000	0.823	0.272	1205.540	297.103	-0.019	308.133
7	0.25	16/16	0	1000	0.850	0.335	1194.944	296.644	-0.012	308.738
8	0.5	16/16	0	1000	0.831	0.300	1196.367	294.442	-0.020	314.532
9	1	16/16	0	1000	0.824	0.307	1211.218	300.838	-0.011	312.323
10	0.5	16/16	0	1000	0.446	0.102	1271.152	332.624	0.039	309.519
11	0.5	16/16	0.004	1000	0.505	0.155	1719.605	462.827	0.059	390.696
12	0.5	16/16	0.04	1000	0.499	0.157	1823.538	533.870	0.139	332.040
13	0.5	16/16	0.4	1000	0.685	0.258	1819.294	527.950	0.164	349.459
14	0.5	16/16	2.0	1000	0.851	0.386	1789.702	505.498	0.133	346.849
15	0.5	16/16	4.0	1000	0.862	0.407	1786.098	501.759	0.127	349.563
16	0.5	16/16	8.0	1000	0.865	0.396	1776.138	496.883	0.121	352.541
17	0.5	16/16	20.0	999	0.874	0.404	1745.257	486.543	0.117	350.533
18	0.5	16/16	40.0	999	0.843	0.457	1720.510	477.489	0.109	345.573
19	0.5	16/16	400.0	1000	0.888	0.391	1716.978	475.571	0.107	349.719
20	0.5	16/16	0	1000	0.465	0.174	1279.462	334.059	0.037	310.765
21	0.5	14/18	0	1000	0.457	0.148	1286.085	333.570	0.030	315.549
22	0.5	12/20	0	1000	0.464	0.159	1254.607	321.763	0.019	308.987
23	0.5	10/22	0	1000	0.461	0.198	1246.970	313.604	0.001	307.337
24	0.5	8/24	0	1000	0.521	0.141	1227.304	298.780	-0.029	310.333
25	0.5	6/26	0	1000	0.554	0.169	1195.796	282.063	-0.057	311.469
26	0.5	4/28	0	1000	0.602	0.303	1152.773	260.724	-0.089	321.146
27	0.5	2/30	0	1000	0.647	0.310	1060.225	235.237	-0.101	318.176
28	0.5	1/31	0	1000	0.681	0.377	979.260	218.077	-0.095	389.383
29	0.5	0/32	0	1000	0.797	0.420	752.484	203.086	0.048	164.104