

Table S1. Results of the evaluation of 11 methods for core subset selection through four conditions and three replications.

Method	Condition	Replication	MR	SH	Time	AR	ObFun	ObFunSt
local	mr70sh30	sample1	0.3308	7.6013	138	96.142132	2.51195	-0.7664255
lr	mr70sh30	sample1	0.3577	7.6305	23239	98.6497462	2.53954	0.85789342
lrsemi	mr70sh30	sample1	0.3577	7.6305	9748	98.6497462	2.53954	0.85789342
mixrep	mr70sh30	sample1	0.3502	7.6234	871	98.5786802	2.53216	0.42340725
mstrat	mr70sh30	sample1	0.3216	7.5938	687	96.7817259	2.50326	-1.2780359
rand	mr70sh30	sample1	0.3217	7.5933	77	95.1269036	2.50318	-1.2827457
remc	mr70sh30	sample1	0.3244	7.5967	432	96.0101523	2.50609	-1.111424
sfs	mr70sh30	sample1	0.3577	7.6305	17615	98.6497462	2.53954	0.85789342
sfssemi	mr70sh30	sample1	0.3577	7.6304	4969	98.6497462	2.53951	0.85612721
steepest	mr70sh30	sample1	0.3204	7.5924	8045	96.9847716	2.502	-1.3522164
tabu	mr70sh30	sample1	0.3211	7.5949	652	96.9238579	2.50324	-1.2792133
local	mr70sh30	sample2	0.3371	7.6118	132	97.3108384	2.51951	-0.3213421
lr	mr70sh30	sample2	0.3633	7.6375	19582	98.8445808	2.54556	1.21231167
lrsemi	mr70sh30	sample2	0.3633	7.6375	11491	98.8445808	2.54556	1.21231167
mixrep	mr70sh30	sample2	0.3556	7.6314	1075	98.599182	2.53834	0.78724526
mstrat	mr70sh30	sample2	0.3276	7.6032	709	97.4744376	2.51028	-0.8647441
rand	mr70sh30	sample2	0.3288	7.6046	79	97.1063395	2.51154	-0.7905636
remc	mr70sh30	sample2	0.3301	7.6038	428	95.7361963	2.51221	-0.7511184
sfs	mr70sh30	sample2	0.3633	7.6375	18450	98.8445808	2.54556	1.21231167
sfssemi	mr70sh30	sample2	0.3632	7.6375	6441	98.8445808	2.54549	1.20819053
steepest	mr70sh30	sample2	0.3265	7.6021	8989	97.0654397	2.50918	-0.929505
tabu	mr70sh30	sample2	0.3275	7.6027	701	97.3415133	2.51006	-0.8776963
local	mr70sh30	sample3	0.3382	7.6168	127	97.3855544	2.52178	-0.1876993
lr	mr70sh30	sample3	0.363	7.6422	22940	99.0539166	2.54676	1.28295983
lrsemi	mr70sh30	sample3	0.363	7.6422	11681	99.0539166	2.54676	1.28295983
mixrep	mr70sh30	sample3	0.3558	7.6358	771	98.646999	2.5398	0.87320052
mstrat	mr70sh30	sample3	0.328	7.6067	638	96.948118	2.51161	-0.7864424
rand	mr70sh30	sample3	0.3269	7.6063	63	97.0803662	2.51072	-0.8388398

remc	mr70sh30	sample3	0.3303	7.6099	407	98.0671414	2.51418	-0.6351376
sfs	mr70sh30	sample3	0.363	7.6422	13824	99.0132248	2.54676	1.28295983
sfssemi	mr70sh30	sample3	0.363	7.6422	5822	99.0539166	2.54676	1.28295983
steepest	mr70sh30	sample3	0.3302	7.6094	7541	97.0803662	2.51396	-0.6480898
tabu	mr70sh30	sample3	0.3275	7.6077	623	97.0803662	2.51156	-0.7893861
local	mr0sh100	sample1	0.3479	7.6331	94	99.0558376	7.6331	0.47800879
lr	mr0sh100	sample1	0.3482	7.6334	16219	99.0862944	7.6334	0.49494611
lrsemi	mr0sh100	sample1	0.3482	7.6334	5601	99.0862944	7.6334	0.49494611
mixrep	mr0sh100	sample1	0.3472	7.6325	93	99.0558376	7.6325	0.44413415
mstrat	mr0sh100	sample1	0.3235	7.5996	94	97.8984772	7.5996	-1.4133252
rand	mr0sh100	sample1	0.3209	7.5942	30	97.1573604	7.5942	-1.7181969
remc	mr0sh100	sample1	0.3331	7.6139	91	98.6091371	7.6139	-0.6059796
sfs	mr0sh100	sample1	0.3482	7.6334	13003	99.0862944	7.6334	0.49494611
sfssemi	mr0sh100	sample1	0.3482	7.6333	3041	99.0862944	7.6333	0.48930033
steepest	mr0sh100	sample1	0.3204	7.5939	3861	96.8832487	7.5939	-1.7351343
tabu	mr0sh100	sample1	0.3241	7.6005	103	97.9695431	7.6005	-1.3625132
local	mr0sh100	sample2	0.3555	7.64	106	99.1104294	7.64	0.86756713
lr	mr0sh100	sample2	0.3552	7.6403	18424	99.1104294	7.6403	0.88450445
lrsemi	mr0sh100	sample2	0.3552	7.6403	6179	99.1104294	7.6403	0.88450445
mixrep	mr0sh100	sample2	0.3545	7.6392	108	99.1513292	7.6392	0.82240094
mstrat	mr0sh100	sample2	0.3285	7.6069	98	98.0879346	7.6069	-1.0011838
rand	mr0sh100	sample2	0.3265	7.6016	34	95.3271984	7.6016	-1.3004097
remc	mr0sh100	sample2	0.339	7.6204	95	98.8752556	7.6204	-0.2390044
sfs	mr0sh100	sample2	0.3552	7.6403	13612	99.1104294	7.6403	0.88450445
sfssemi	mr0sh100	sample2	0.3551	7.6402	2936	99.1104294	7.6402	0.87885867
steepest	mr0sh100	sample2	0.328	7.6041	3890	97.1370143	7.6041	-1.1592654
tabu	mr0sh100	sample2	0.3298	7.6081	107	98.190184	7.6081	-0.9334345
local	mr0sh100	sample3	0.3536	7.6448	96	99.318413	7.6448	1.13856423
lr	mr0sh100	sample3	0.3538	7.645	16587	99.4201424	7.645	1.14985578
lrsemi	mr0sh100	sample3	0.3538	7.645	6187	99.4201424	7.645	1.14985578
mixrep	mr0sh100	sample3	0.3534	7.644	93	99.4201424	7.644	1.09339805

mstrat	mr0sh100	sample3	0.3268	7.6106	94	98.474059	7.6106	-0.7922902
rand	mr0sh100	sample3	0.3269	7.6076	29	95.9003052	7.6076	-0.9616633
remc	mr0sh100	sample3	0.34	7.6253	91	98.809766	7.6253	0.03763849
sfs	mr0sh100	sample3	0.3538	7.645	13133	99.4201424	7.645	1.14985578
sfssemi	mr0sh100	sample3	0.3536	7.645	3020	99.4201424	7.645	1.14985578
steepest	mr0sh100	sample3	0.327	7.6078	3503	97.5890132	7.6078	-0.9503718
tabu	mr0sh100	sample3	0.33	7.6102	94	98.2400814	7.6102	-0.8148732
local	mr100sh0	sample1	0.33	7.602	129	97.7969543	0.33	-0.7194809
lr	mr100sh0	sample1	0.3581	7.6284	11784	98.6497462	0.3581	0.91815929
lrsemi	mr100sh0	sample1	0.3581	7.6284	4824	98.6497462	0.3581	0.91815929
mixrep	mr100sh0	sample1	0.3503	7.621	669	98.1725888	0.3503	0.46358302
mstrat	mr100sh0	sample1	0.3201	7.5925	649	96.751269	0.3201	-1.296443
rand	mr100sh0	sample1	0.3207	7.5935	69	95.0964467	0.3207	-1.2614756
remc	mr100sh0	sample1	0.3258	7.5984	406	97.8680203	0.3258	-0.9642527
sfs	mr100sh0	sample1	0.3581	7.6284	5168	98.6497462	0.3581	0.91815929
sfssemi	mr100sh0	sample1	0.3581	7.6284	2641	98.6497462	0.3581	0.91815929
steepest	mr100sh0	sample1	0.3219	7.5951	4331	97.2284264	0.3219	-1.1915408
tabu	mr100sh0	sample1	0.3216	7.5945	640	96.8832487	0.3216	-1.2090245
local	mr100sh0	sample2	0.3364	7.6107	140	96.3190184	0.3364	-0.3464952
lr	mr100sh0	sample2	0.3637	7.6351	7550	98.7014315	0.3637	1.24452174
lrsemi	mr100sh0	sample2	0.3637	7.6351	5102	98.7014315	0.3637	1.24452174
mixrep	mr100sh0	sample2	0.3562	7.6295	785	98.5378323	0.3562	0.80742917
mstrat	mr100sh0	sample2	0.3279	7.6036	673	97.7198364	0.3279	-0.8418668
rand	mr100sh0	sample2	0.3265	7.6027	74	96.8609407	0.3265	-0.9234574
remc	mr100sh0	sample2	0.3293	7.6038	414	95.3680982	0.3293	-0.7602762
sfs	mr100sh0	sample2	0.3637	7.6351	9719	98.7014315	0.3637	1.24452174
sfssemi	mr100sh0	sample2	0.3636	7.6351	3244	98.7014315	0.3636	1.23869384
steepest	mr100sh0	sample2	0.3275	7.6036	4614	97.7505112	0.3275	-0.8651784
tabu	mr100sh0	sample2	0.3262	7.6027	683	97.8220859	0.3262	-0.9409411
local	mr100sh0	sample3	0.3376	7.6153	123	97.4262462	0.3376	-0.2765604
lr	mr100sh0	sample3	0.3634	7.64	6930	98.8504578	0.3634	1.22703804

lrsemi	mr100sh0	sample3	0.3634	7.64	4641	98.8504578	0.3634	1.22703804
mixrep	mr100sh0	sample3	0.3563	7.6337	657	98.3723296	0.3563	0.81325707
mstrat	mr100sh0	sample3	0.3287	7.6079	617	97.7619532	0.3287	-0.7952436
rand	mr100sh0	sample3	0.326	7.6064	63	96.8158698	0.326	-0.9525969
remc	mr100sh0	sample3	0.3324	7.6101	387	96.7141404	0.3324	-0.5796112
sfs	mr100sh0	sample3	0.3634	7.64	4978	98.8504578	0.3634	1.22703804
sfssemi	mr100sh0	sample3	0.3633	7.6399	2556	98.8504578	0.3633	1.22121013
steepest	mr100sh0	sample3	0.3267	7.6065	4051	97.6907426	0.3267	-0.9118016
tabu	mr100sh0	sample3	0.3287	7.6072	623	96.6429298	0.3287	-0.7952436
local	mr50sh50	sample1	0.3324	7.6045	129	97.6954315	3.96845	-0.6649756
lr	mr50sh50	sample1	0.3569	7.6317	19718	98.7817259	3.9943	0.82721806
lrsemi	mr50sh50	sample1	0.3569	7.6317	11228	98.7817259	3.9943	0.82721806
mixrep	mr50sh50	sample1	0.3499	7.6247	788	98.5482234	3.9873	0.42314242
mstrat	mr50sh50	sample1	0.3232	7.5954	646	97.0558376	3.9593	-1.1931602
rand	mr50sh50	sample1	0.3199	7.5914	71	95.5634518	3.95565	-1.4038567
remc	mr50sh50	sample1	0.3232	7.5965	410	96.9847716	3.95985	-1.1614114
sfs	mr50sh50	sample1	0.3569	7.6317	18571	98.7817259	3.9943	0.82721806
sfssemi	mr50sh50	sample1	0.3569	7.6317	6078	98.7817259	3.9943	0.82721806
steepest	mr50sh50	sample1	0.3214	7.5939	8928	96.3756345	3.95765	-1.2884066
tabu	mr50sh50	sample1	0.3206	7.5933	648	97.5634518	3.95695	-1.3288141
local	mr50sh50	sample2	0.3351	7.6108	142	97.4744376	3.97295	-0.4052127
lr	mr50sh50	sample2	0.3625	7.6388	20719	98.9775051	4.00065	1.1937724
lrsemi	mr50sh50	sample2	0.3625	7.6388	12258	98.9775051	4.00065	1.1937724
mixrep	mr50sh50	sample2	0.3551	7.6317	780	98.8752556	3.9934	0.77526548
mstrat	mr50sh50	sample2	0.3268	7.6027	681	97.3415133	3.96475	-0.8785584
rand	mr50sh50	sample2	0.326	7.6003	71	95.6339468	3.96315	-0.9709186
remc	mr50sh50	sample2	0.3297	7.6056	415	97.5153374	3.96765	-0.7111556
sfs	mr50sh50	sample2	0.3624	7.6388	18278	98.9775051	4.0006	1.19088614
sfssemi	mr50sh50	sample2	0.3624	7.6387	5730	98.9775051	4.00055	1.18799989
steepest	mr50sh50	sample2	0.3261	7.6017	8214	97.00409	3.9639	-0.9276247
tabu	mr50sh50	sample2	0.3279	7.602	640	96.799591	3.96495	-0.8670134

local	mr50sh50	sample3	0.3366	7.6162	123	97.3245168	3.9764	-0.2060611
lr	mr50sh50	sample3	0.3622	7.6434	18525	99.0844354	4.0028	1.31788135
lrsemi	mr50sh50	sample3	0.3622	7.6434	11381	99.0844354	4.0028	1.31788135
mixrep	mr50sh50	sample3	0.3548	7.6365	761	99.155646	3.99565	0.90514694
mstrat	mr50sh50	sample3	0.3277	7.6067	628	97.3550356	3.9672	-0.7371319
rand	mr50sh50	sample3	0.3284	7.6077	62	96.8158698	3.96805	-0.6880656
remc	mr50sh50	sample3	0.3298	7.6099	386	97.456765	3.96985	-0.5841604
sfs	mr50sh50	sample3	0.3622	7.6434	13352	99.0844354	4.0028	1.31788135
sfssemi	mr50sh50	sample3	0.3622	7.6434	4348	99.0844354	4.0028	1.31788135
steepest	mr50sh50	sample3	0.3282	7.6067	7645	97.4262462	3.96745	-0.7227007
tabu	mr50sh50	sample3	0.328	7.6073	625	97.1515768	3.96765	-0.7111556

Table S2. Percentages of common accessions among core subsets generated by eleven methods through optimization of an objective function that contains MR and SH with equal weights. The data contained information from 1,500 SNP loci.

Method	Local	LR	LRSemi	MixRep	MSTRAT	Rand	REMC	SFS	SFSSemi	Steepest
LR	16.54									
LRSemi	16.54	100.00								
MixRep	16.29	55.14	55.14							
MSTRAT	9.65	9.65	9.65	12.03						
Rand	7.77	8.15	8.15	8.52	10.28					
REMC	9.65	11.40	11.40	11.28	9.90	9.77				
SFS	16.54	99.75	99.75	55.14	9.65	8.15	11.28			
SFSSemi	16.54	99.62	99.62	55.26	9.52	8.02	11.40	99.75		
Steepest	8.27	10.78	10.78	10.40	9.65	11.28	9.40	10.78	10.90	
Tabu	8.27	9.52	9.52	8.65	9.77	9.40	9.27	9.52	9.40	10.40