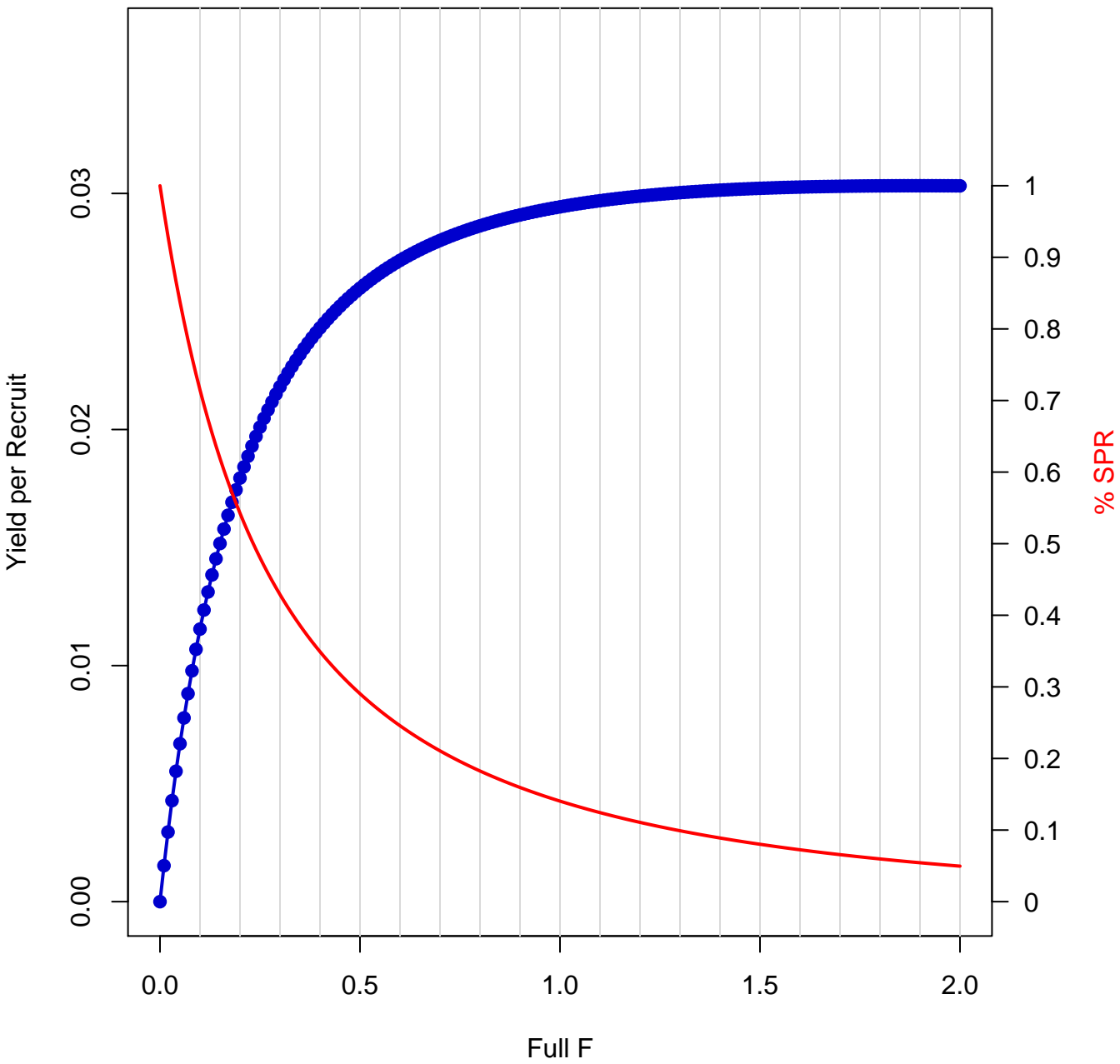


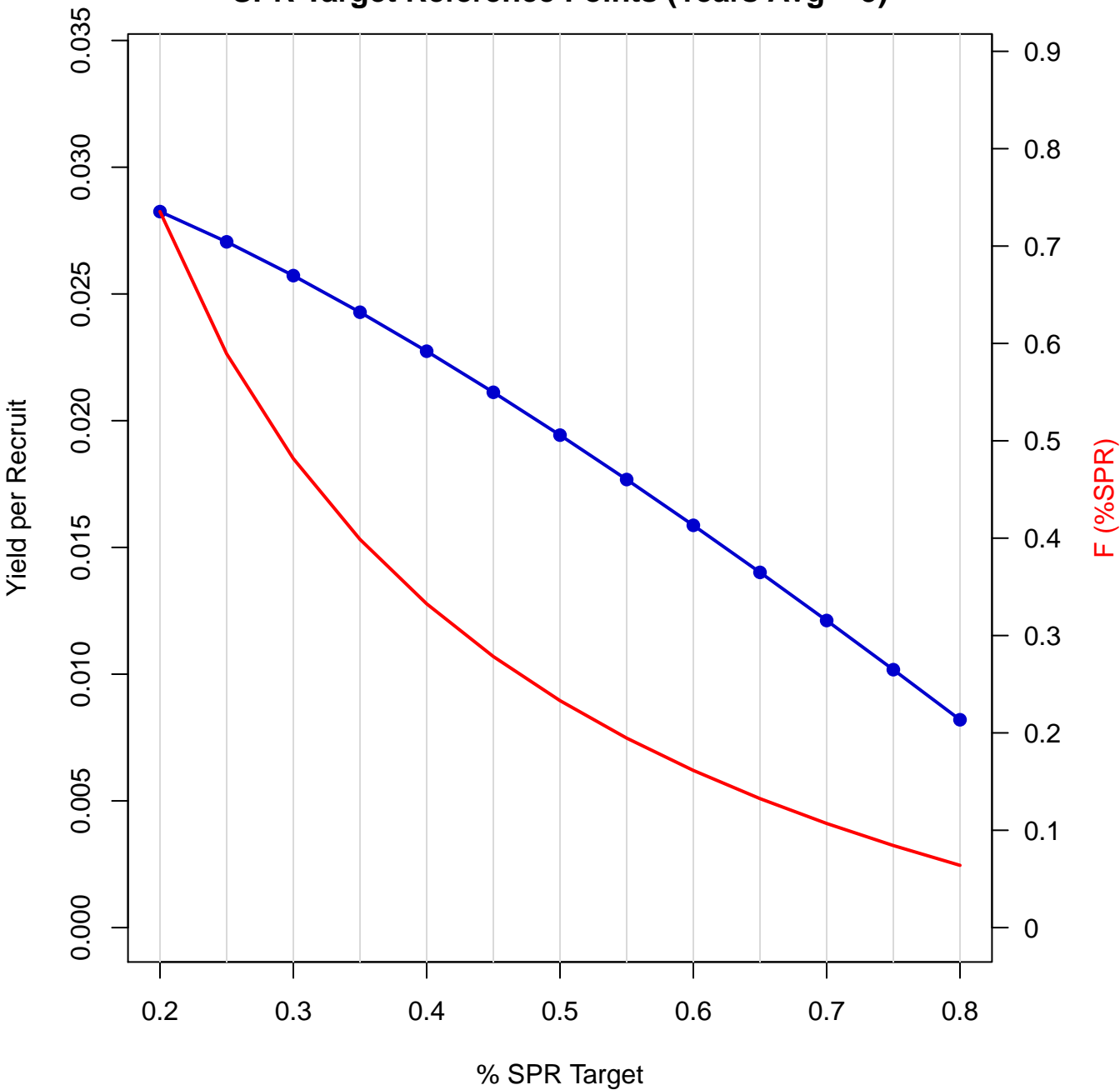
**YPR-SPR Reference Points (Years Avg = 5)**



# YPR–SPR Reference Points (Years Avg = 5)

F	YPR	SPR	F	YPR	SPR	F	YPR	SPR
0	0	1	0.35	0.0232	0.3858	0.7	0.028	0.2107
0.01	0.0015	0.9636	0.36	0.0234	0.378	0.71	0.0281	0.2076
0.02	0.0029	0.9293	0.37	0.0237	0.3704	0.72	0.0281	0.2045
0.03	0.0043	0.897	0.38	0.0239	0.3631	0.73	0.0282	0.2016
0.04	0.0055	0.8665	0.39	0.0241	0.356	0.74	0.0283	0.1987
0.05	0.0067	0.8377	0.4	0.0243	0.3492	0.75	0.0283	0.1958
0.06	0.0078	0.8105	0.41	0.0245	0.3425	0.76	0.0284	0.1931
0.07	0.0088	0.7846	0.42	0.0247	0.336	0.77	0.0285	0.1903
0.08	0.0098	0.7602	0.43	0.0249	0.3297	0.78	0.0285	0.1877
0.09	0.0107	0.7369	0.44	0.0251	0.3236	0.79	0.0286	0.1851
0.1	0.0115	0.7148	0.45	0.0252	0.3177	0.8	0.0286	0.1825
0.11	0.0124	0.6938	0.46	0.0254	0.312	0.81	0.0287	0.18
0.12	0.0131	0.6737	0.47	0.0255	0.3064	0.82	0.0287	0.1775
0.13	0.0138	0.6546	0.48	0.0257	0.3009	0.83	0.0288	0.1751
0.14	0.0145	0.6364	0.49	0.0258	0.2956	0.84	0.0288	0.1728
0.15	0.0152	0.619	0.5	0.026	0.2905	0.85	0.0289	0.1705
0.16	0.0158	0.6024	0.51	0.0261	0.2855	0.86	0.0289	0.1682
0.17	0.0164	0.5864	0.52	0.0263	0.2806	0.87	0.029	0.1659
0.18	0.0169	0.5712	0.53	0.0264	0.2758	0.88	0.029	0.1638
0.19	0.0174	0.5566	0.54	0.0265	0.2712	0.89	0.029	0.1616
0.2	0.0179	0.5426	0.55	0.0266	0.2667	0.9	0.0291	0.1595
0.21	0.0184	0.5291	0.56	0.0267	0.2623	0.91	0.0291	0.1574
0.22	0.0189	0.5162	0.57	0.0269	0.258	0.92	0.0292	0.1554
0.23	0.0193	0.5038	0.58	0.027	0.2538	0.93	0.0292	0.1534
0.24	0.0197	0.4919	0.59	0.0271	0.2497	0.94	0.0292	0.1515
0.25	0.0201	0.4804	0.6	0.0272	0.2457	0.95	0.0293	0.1495
0.26	0.0205	0.4693	0.61	0.0273	0.2418	0.96	0.0293	0.1476
0.27	0.0208	0.4587	0.62	0.0274	0.2381	0.97	0.0293	0.1458
0.28	0.0212	0.4484	0.63	0.0274	0.2343	0.98	0.0294	0.144
0.29	0.0215	0.4385	0.64	0.0275	0.2307	0.99	0.0294	0.1422
0.3	0.0218	0.4289	0.65	0.0276	0.2272	1	0.0294	0.1404
0.31	0.0221	0.4197	0.66	0.0277	0.2237	1.01	0.0295	0.1387
0.32	0.0224	0.4108	0.67	0.0278	0.2203	1.02	0.0295	0.137
0.33	0.0227	0.4022	0.68	0.0279	0.217	1.03	0.0295	0.1353
0.34	0.0229	0.3939	0.69	0.0279	0.2138	1.04	0.0295	0.1337

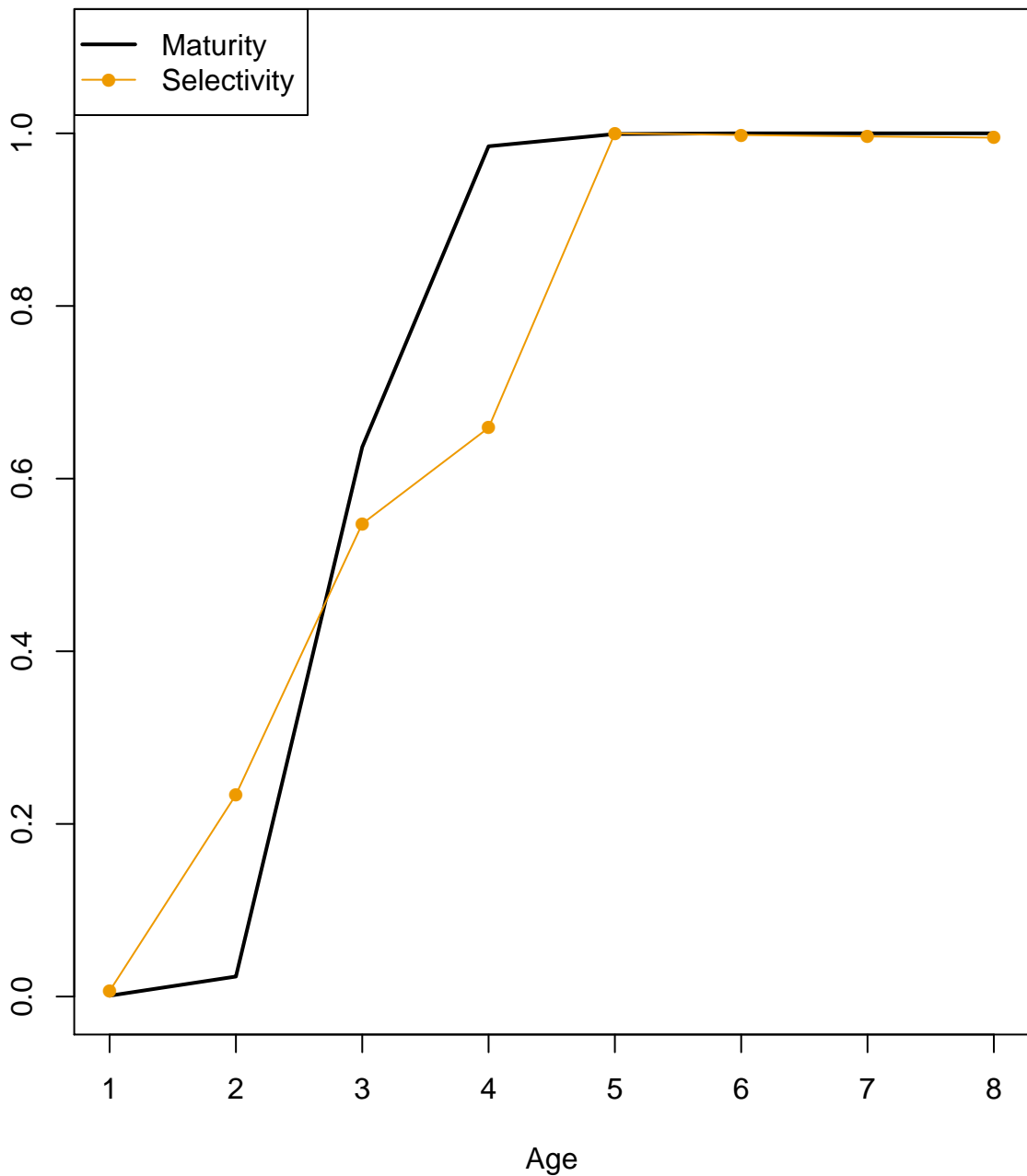
**SPR Target Reference Points (Years Avg = 5)**



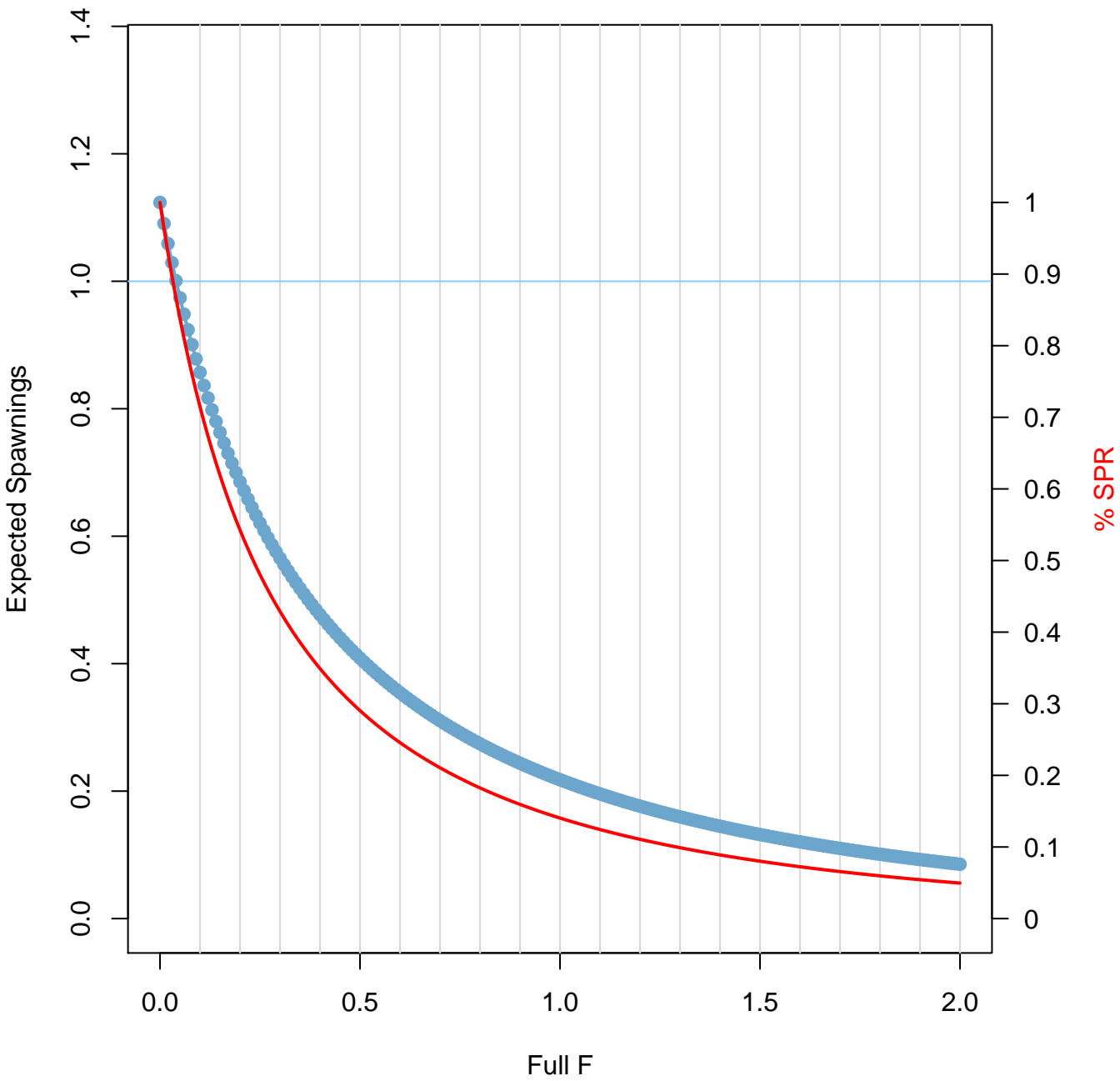
## SPR Target Reference Points (Years Avg = 5)

% SPR	F(%SPR)	YPR
0.2	0.7354	0.0283
0.25	0.5893	0.0271
0.3	0.4817	0.0257
0.35	0.3988	0.0243
0.4	0.3326	0.0227
0.45	0.2784	0.0211
0.5	0.2331	0.0194
0.55	0.1946	0.0177
0.6	0.1615	0.0159
0.65	0.1325	0.014
0.7	0.107	0.0121
0.75	0.0843	0.0102
0.8	0.064	0.0082

Selectivity or Maturity at age



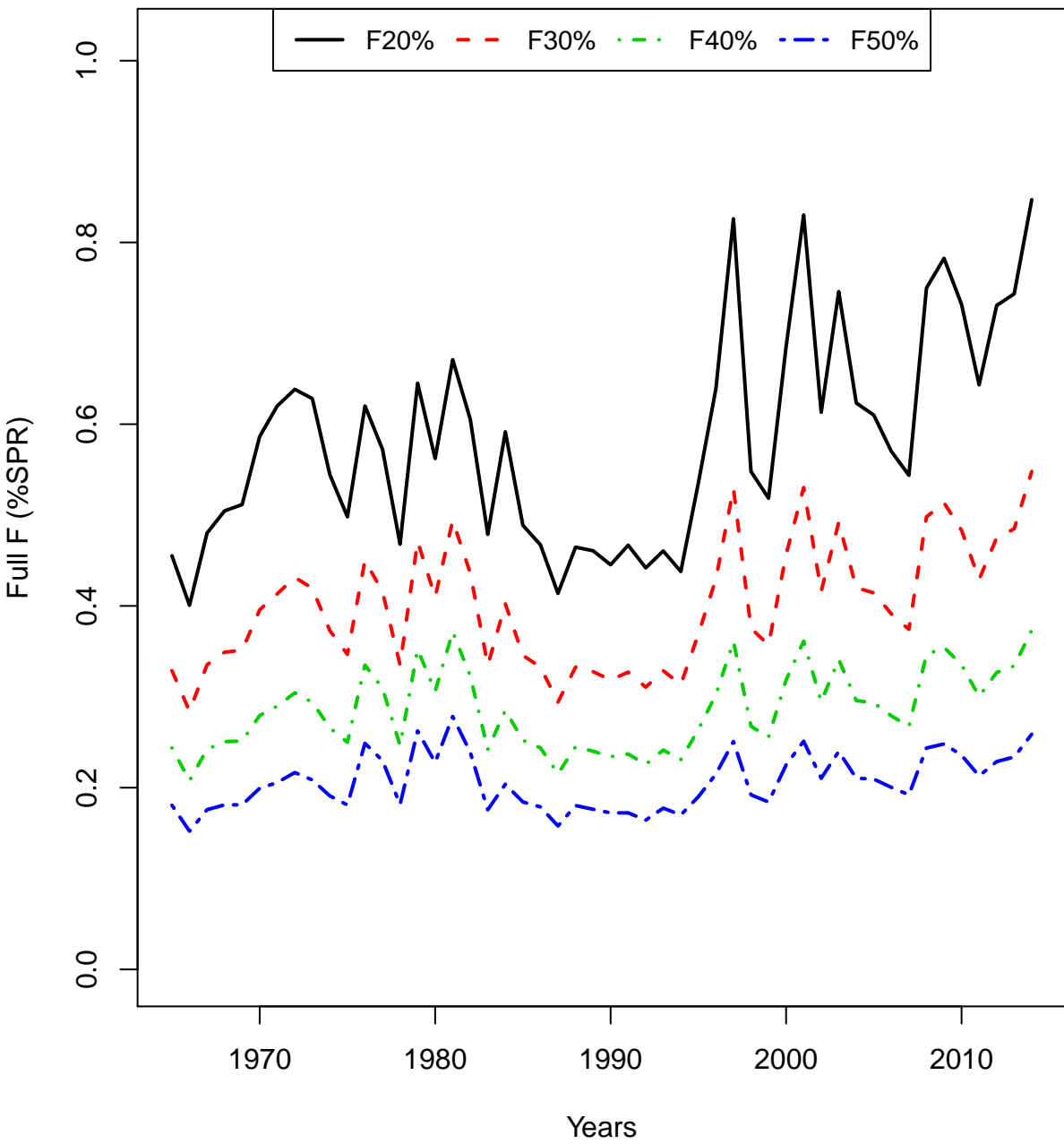
Expected Spawnings and SPR Reference Points (Years Avg = 5)



# Expected Spawnings & SPR Reference Points (Years Avg = 5)

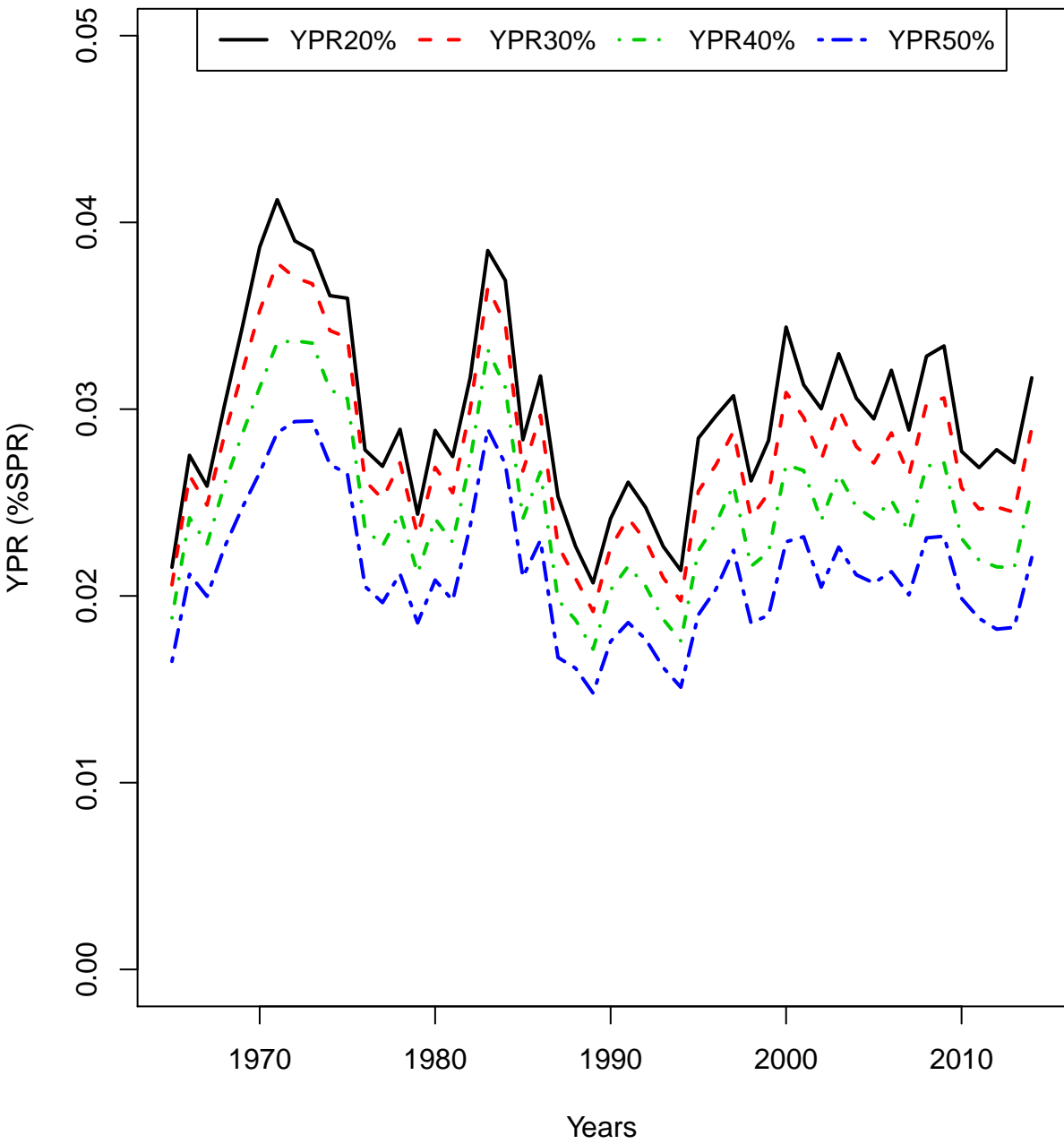
F	E[Sp]	SPR	F	E[Sp]	SPR	F	E[Sp]	SPR
0	1.1237	1	0.35	0.5181	0.3858	0.7	0.3106	0.2107
0.01	1.0905	0.9636	0.36	0.5094	0.378	0.71	0.3067	0.2076
0.02	1.059	0.9293	0.37	0.5009	0.3704	0.72	0.3028	0.2045
0.03	1.0292	0.897	0.38	0.4927	0.3631	0.73	0.299	0.2016
0.04	1.0009	0.8665	0.39	0.4846	0.356	0.74	0.2953	0.1987
0.05	0.974	0.8377	0.4	0.4768	0.3492	0.75	0.2916	0.1958
0.06	0.9483	0.8105	0.41	0.4692	0.3425	0.76	0.288	0.1931
0.07	0.9239	0.7846	0.42	0.4618	0.336	0.77	0.2845	0.1903
0.08	0.9006	0.7602	0.43	0.4546	0.3297	0.78	0.281	0.1877
0.09	0.8783	0.7369	0.44	0.4475	0.3236	0.79	0.2776	0.1851
0.1	0.8569	0.7148	0.45	0.4406	0.3177	0.8	0.2743	0.1825
0.11	0.8365	0.6938	0.46	0.4339	0.312	0.81	0.271	0.18
0.12	0.8169	0.6737	0.47	0.4274	0.3064	0.82	0.2678	0.1775
0.13	0.7981	0.6546	0.48	0.421	0.3009	0.83	0.2646	0.1751
0.14	0.7801	0.6364	0.49	0.4147	0.2956	0.84	0.2615	0.1728
0.15	0.7628	0.619	0.5	0.4086	0.2905	0.85	0.2584	0.1705
0.16	0.7461	0.6024	0.51	0.4027	0.2855	0.86	0.2554	0.1682
0.17	0.7301	0.5864	0.52	0.3968	0.2806	0.87	0.2524	0.1659
0.18	0.7146	0.5712	0.53	0.3911	0.2758	0.88	0.2495	0.1638
0.19	0.6997	0.5566	0.54	0.3856	0.2712	0.89	0.2466	0.1616
0.2	0.6854	0.5426	0.55	0.3801	0.2667	0.9	0.2438	0.1595
0.21	0.6715	0.5291	0.56	0.3748	0.2623	0.91	0.241	0.1574
0.22	0.6581	0.5162	0.57	0.3695	0.258	0.92	0.2383	0.1554
0.23	0.6452	0.5038	0.58	0.3644	0.2538	0.93	0.2356	0.1534
0.24	0.6327	0.4919	0.59	0.3594	0.2497	0.94	0.233	0.1515
0.25	0.6205	0.4804	0.6	0.3545	0.2457	0.95	0.2304	0.1495
0.26	0.6088	0.4693	0.61	0.3497	0.2418	0.96	0.2278	0.1476
0.27	0.5975	0.4587	0.62	0.345	0.2381	0.97	0.2253	0.1458
0.28	0.5865	0.4484	0.63	0.3404	0.2343	0.98	0.2228	0.144
0.29	0.5758	0.4385	0.64	0.3359	0.2307	0.99	0.2203	0.1422
0.3	0.5655	0.4289	0.65	0.3315	0.2272	1	0.2179	0.1404
0.31	0.5554	0.4197	0.66	0.3271	0.2237	1.01	0.2155	0.1387
0.32	0.5457	0.4108	0.67	0.3229	0.2203	1.02	0.2132	0.137
0.33	0.5362	0.4022	0.68	0.3187	0.217	1.03	0.2109	0.1353
0.34	0.527	0.3939	0.69	0.3146	0.2138	1.04	0.2086	0.1337

**Annual F(%SPR) Reference Points**

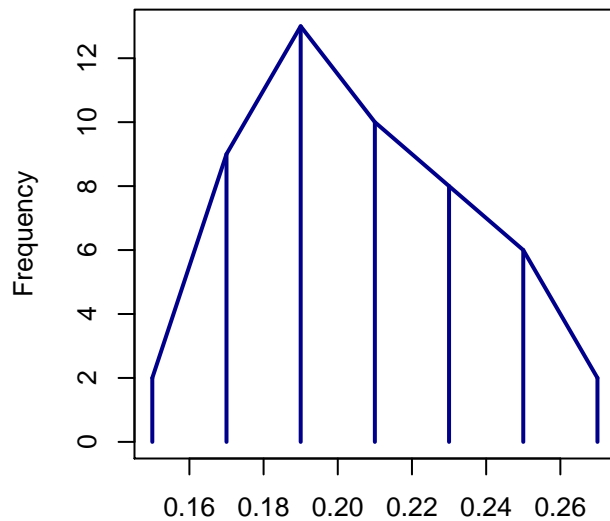
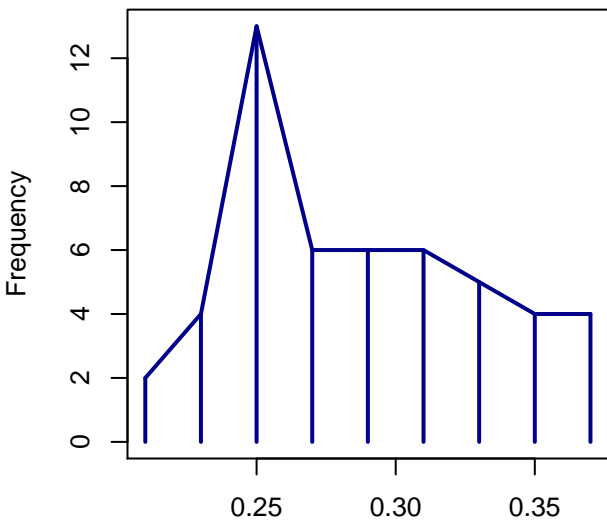
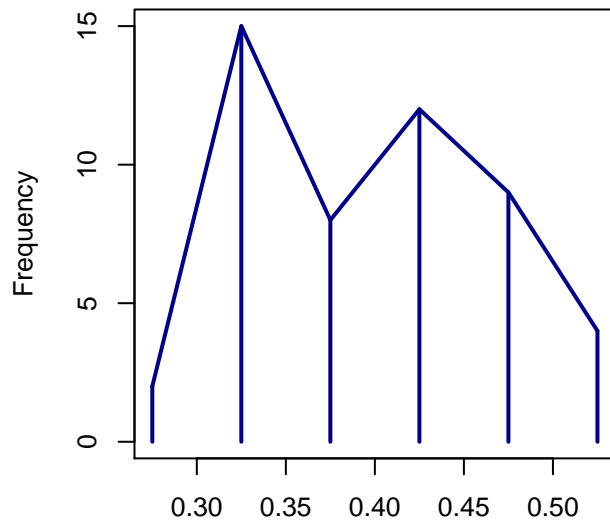
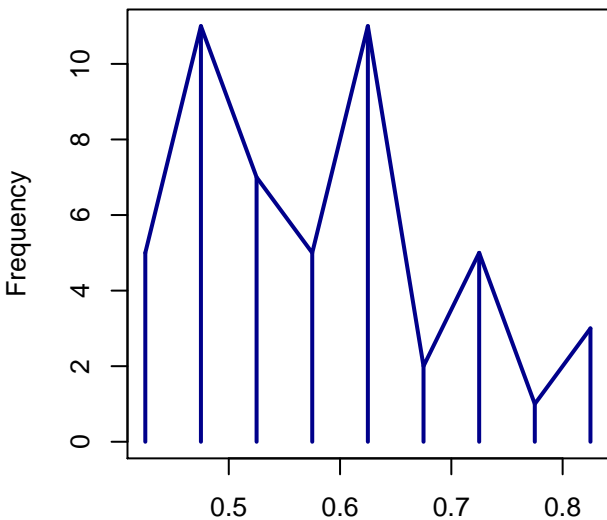




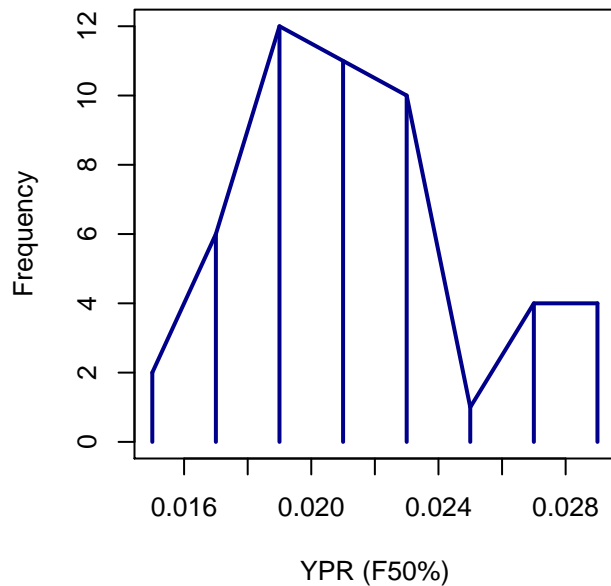
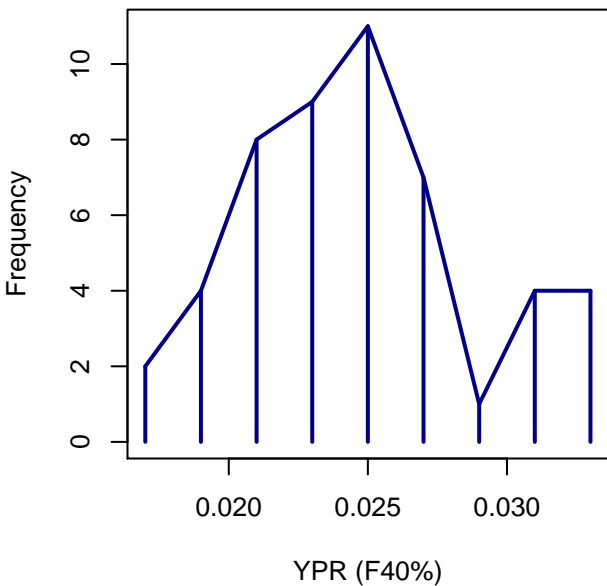
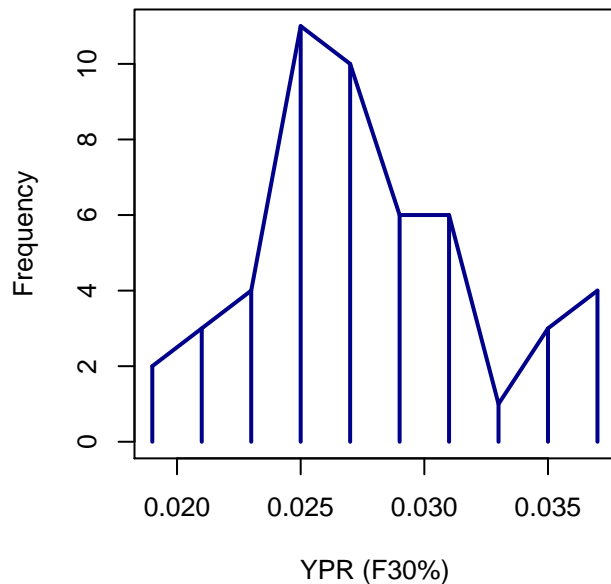
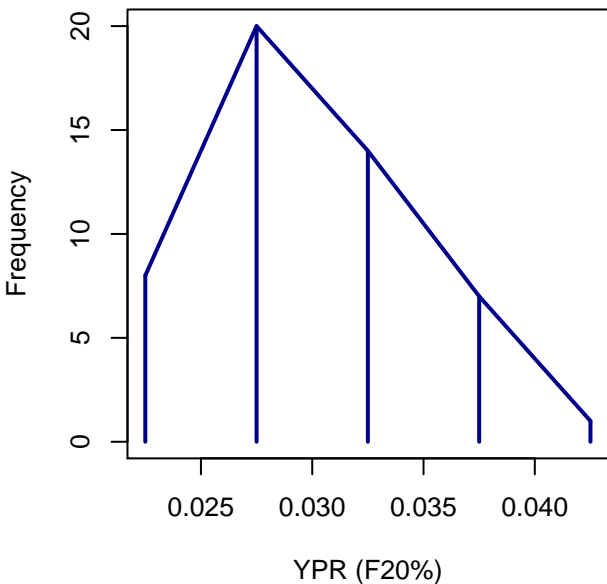
**Annual YPR(%SPR) Reference Points**



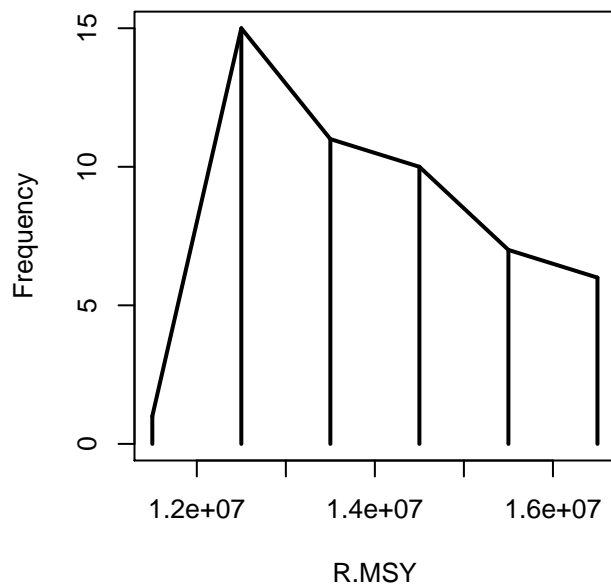
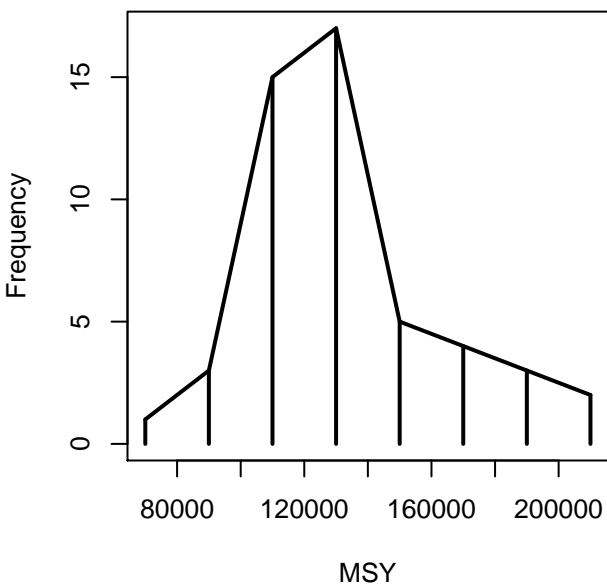
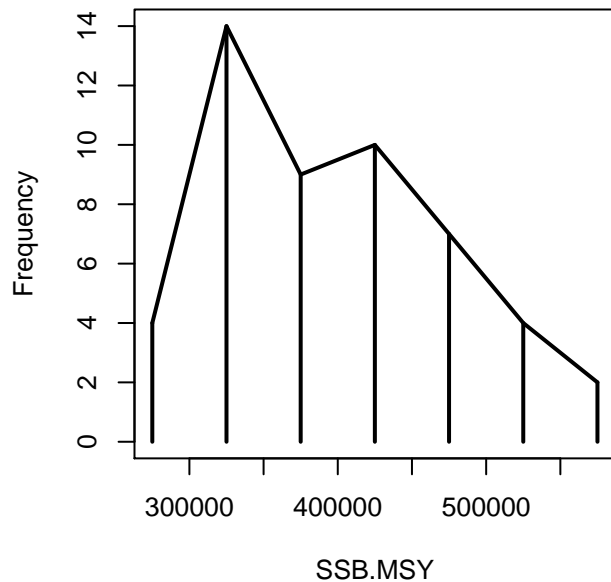
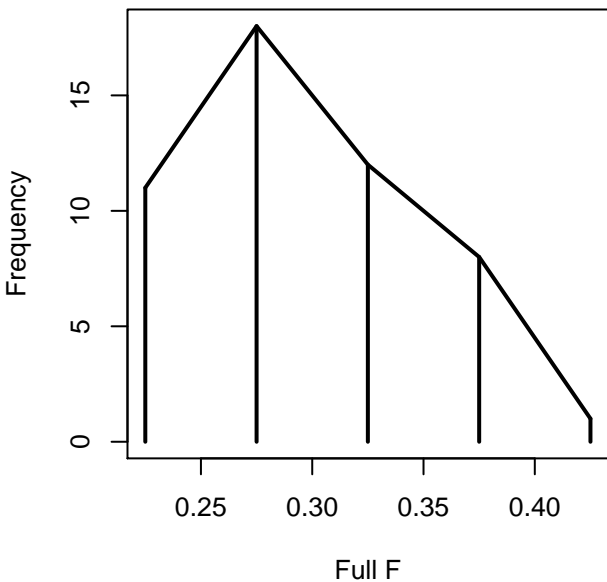
## Annual F (%SPR) Reference Points



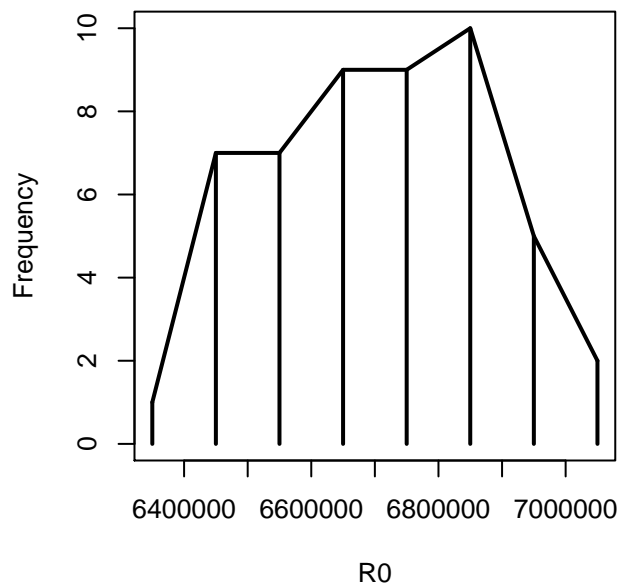
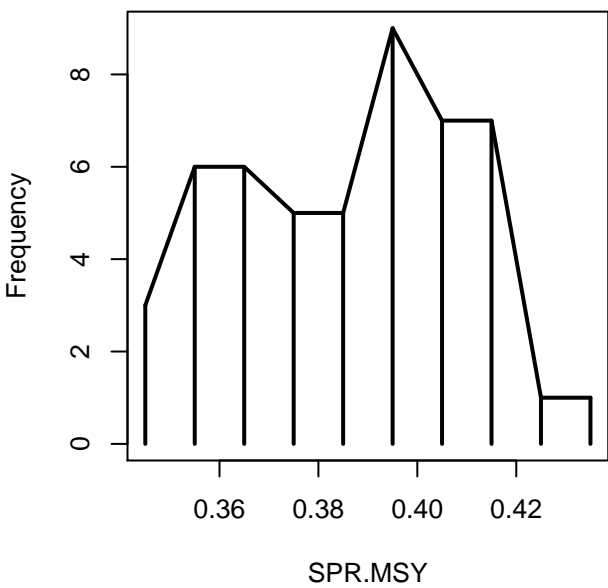
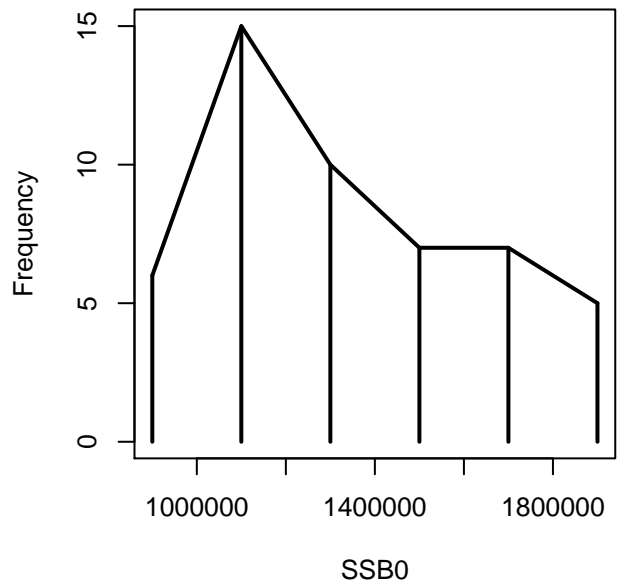
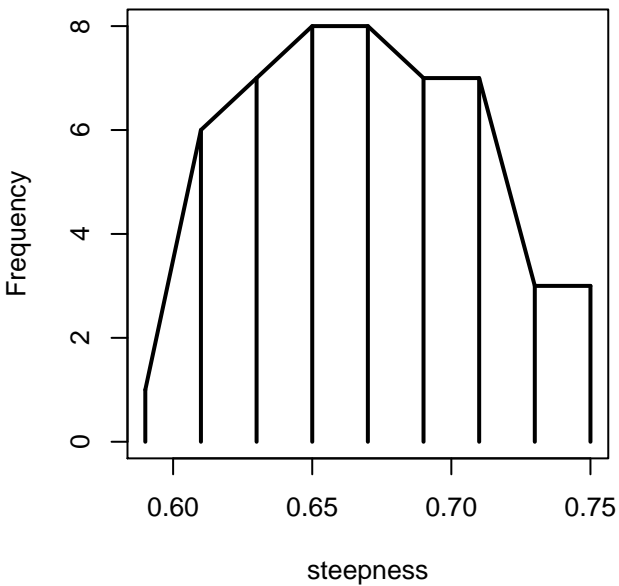
# Annual YPR (%SPR) Reference Points



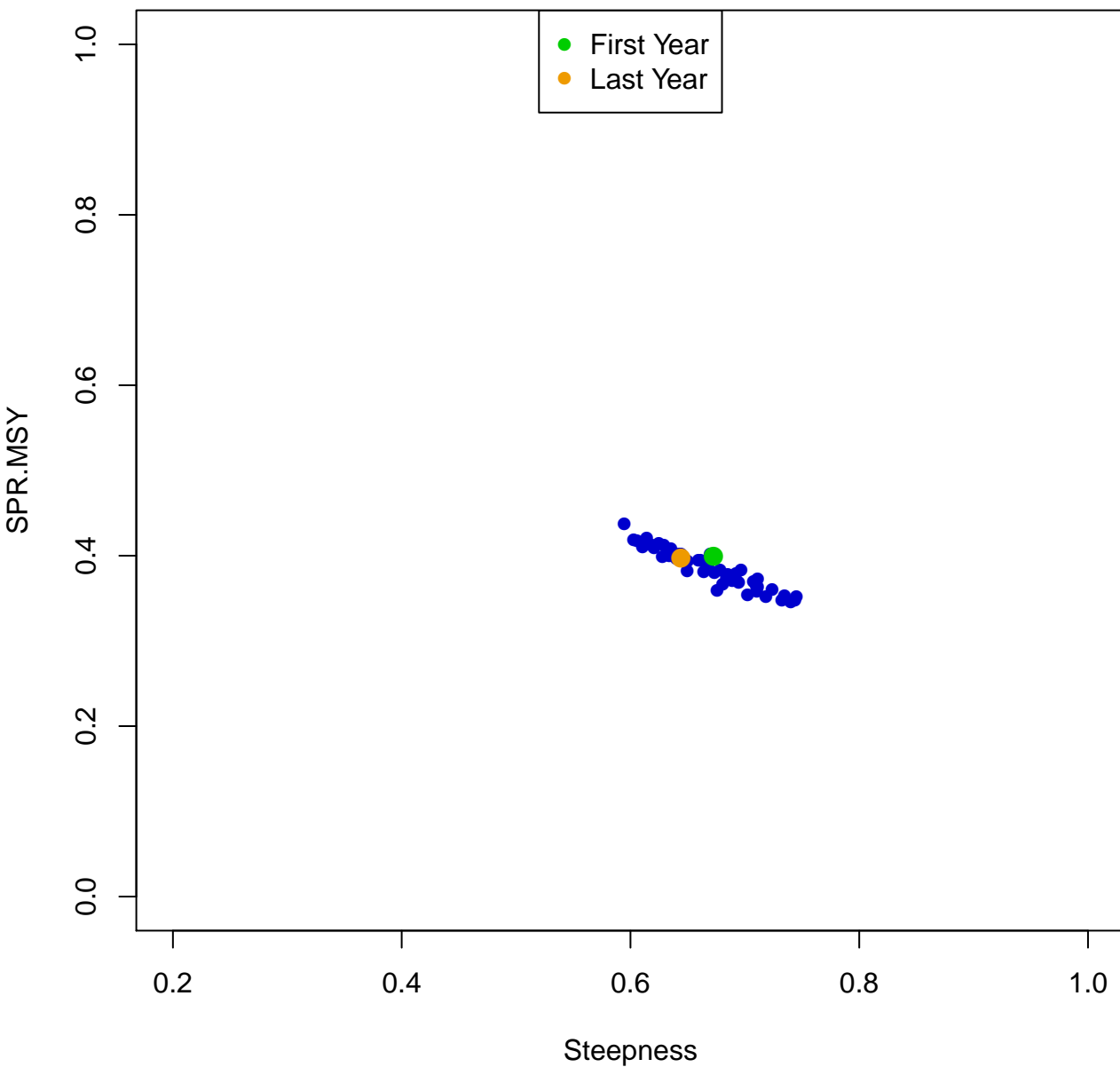
# Annual MSY Reference Points (from S-R curve)



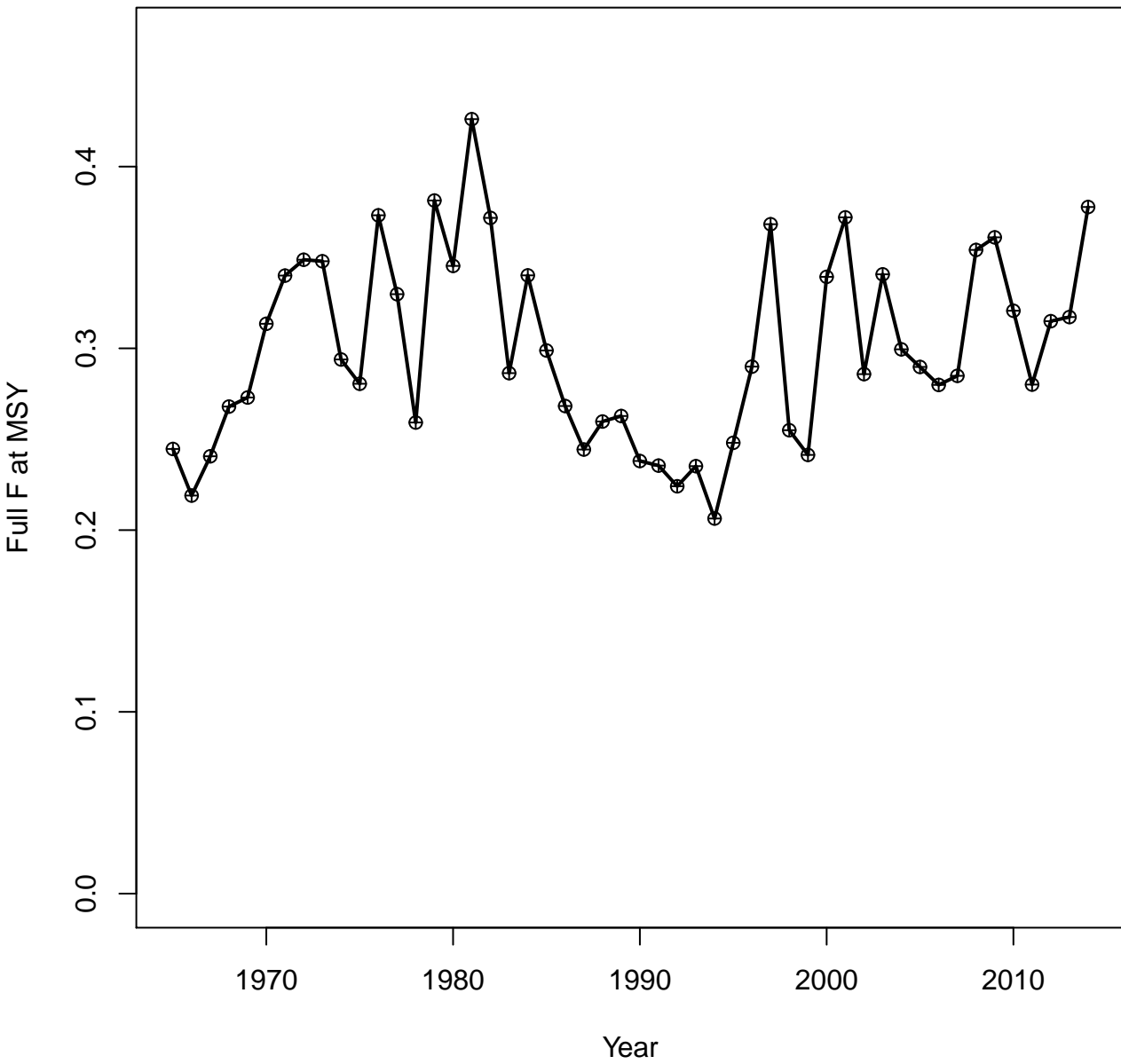
# Annual MSY Reference Points (from S-R curve)



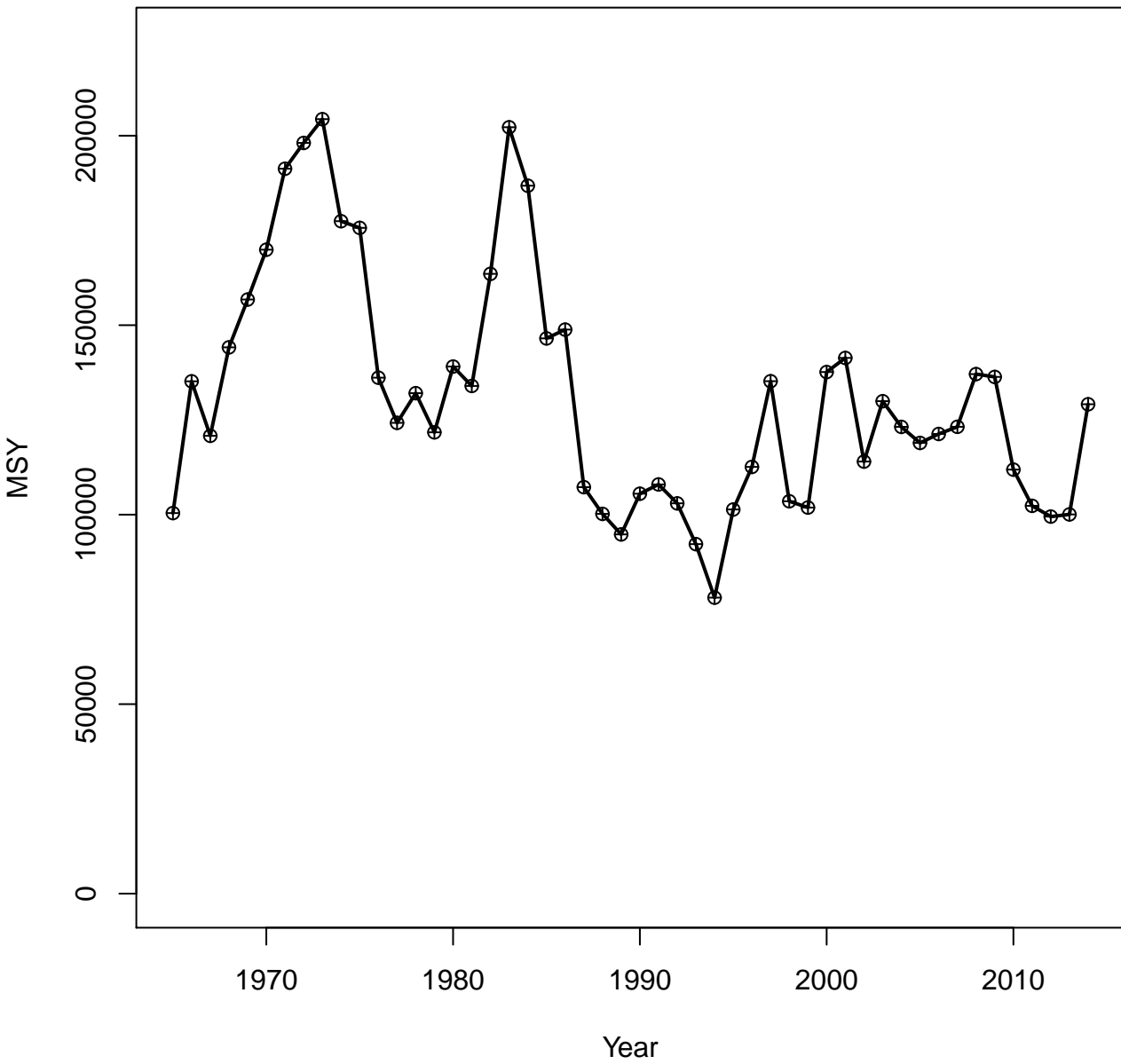
**Annual Steepness and SPR.MSY (from S-R curve)**



## Annual MSY Reference Points (from S-R curve)

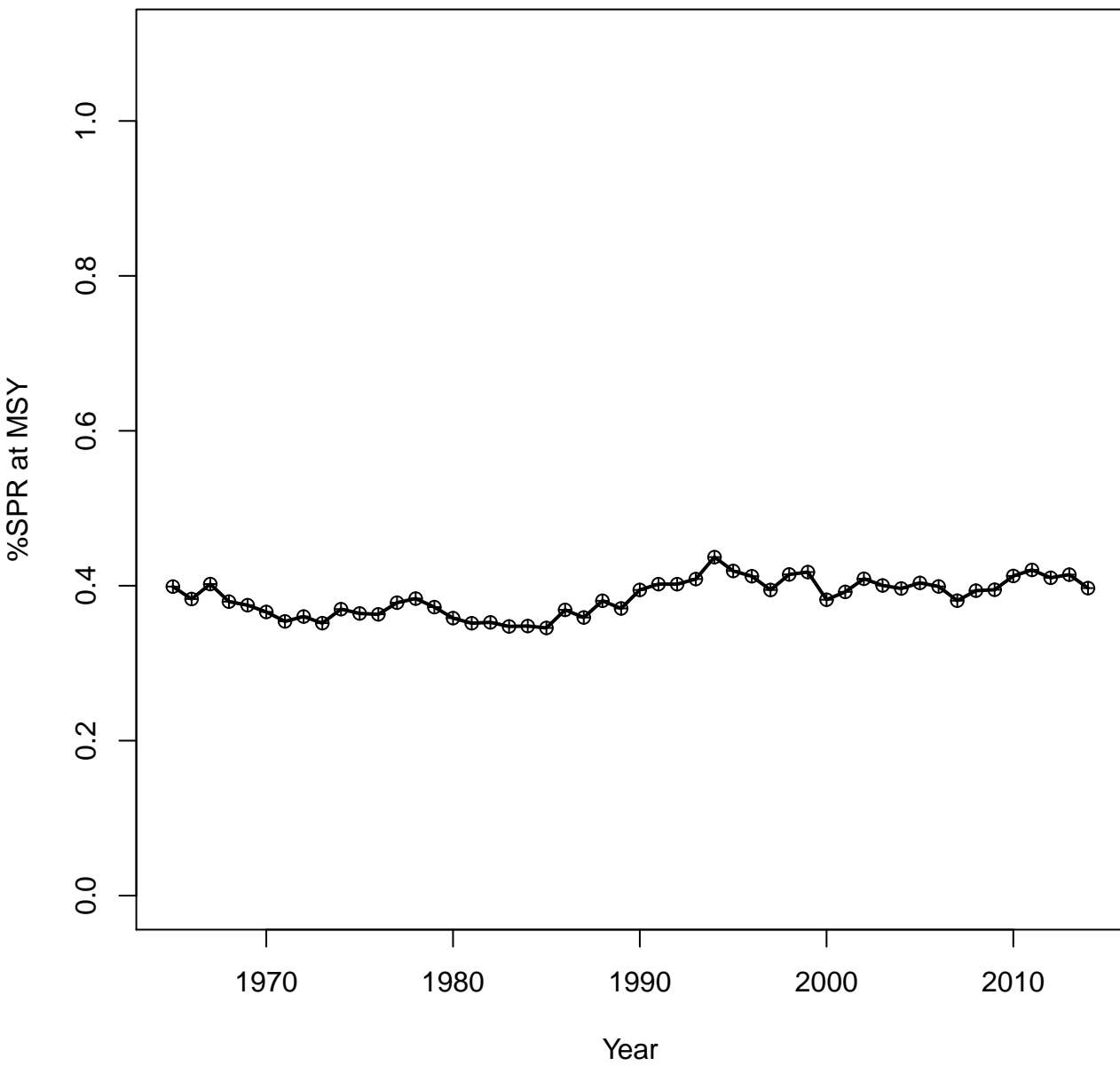


**Annual MSY Reference Points (from S-R curve)**

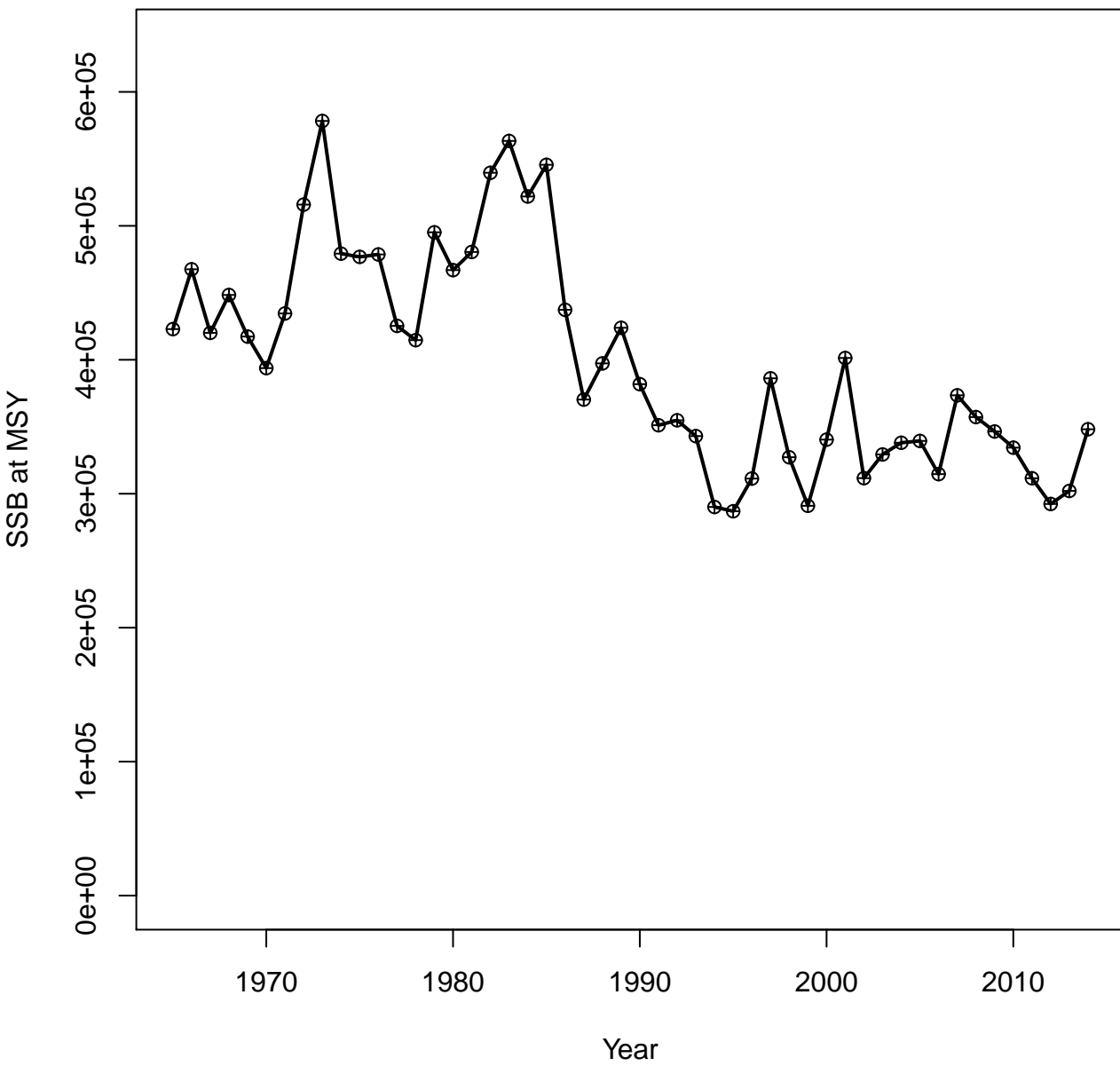




## Annual MSY Reference Points (from S-R curve)



**Annual MSY Reference Points (from S-R curve)**



## Annual MSY Reference Points (from S-R curve)

