

Broodstock Collection in 2013: Model Results

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April 2013

Broodstock Calculation

Basic Broodstock Calculation

$$\begin{array}{cccccccccc} \text{Number} & & \text{Pre-} & & \text{BKD} & & \text{Egg to} & & & \\ \text{of} & & \text{Spawn} & & \text{Culling} & & \text{Release} & & & \\ \text{Females} & \times & \text{Survival} & \times & \text{Survival} & \times & \text{Survival} & \times & & \\ \text{Collected} & & & & & & & & = & \text{Smolts} \end{array}$$

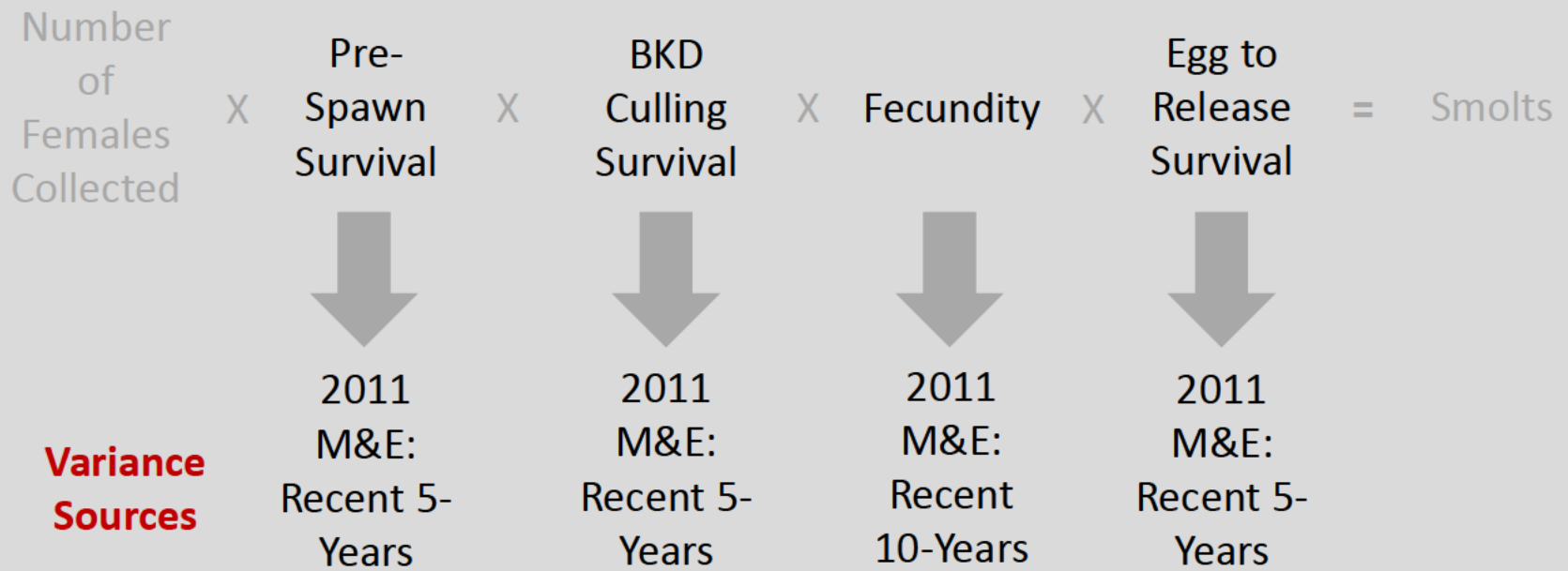
Assume 1:1 Sex Ratio

$$\begin{array}{ccc} + & \text{Number} & = \\ & \text{of Males} & \\ & \text{Collected} & \\ & & \text{Total} \\ & & \text{Broodstock} \end{array}$$

Broodstock Calculation

Data Sources

Used 2013 Broodstock Protocol Mean Values



Size Matters

Program				Females			
90%	100%	110%	Fecundity	90%	100%	110%	Range
27,000	30,000	33,000	5,000	6	6	7	1
270,000	300,000	330,000	5,000	54	60	66	12

Methow Spring Chinook Program

134,126	Broodstock							
P ≥ Target	Total	Hatchery	Wild	Mean Production	Lower 95% CI	Upper 95% CI	P < 90% of Target	P > 110% of Target
0.400	84	20	64	132,116	115,883	148,661	0.086	0.034
0.450								
0.500								
0.550	86	20	66	135,465	118,805	152,446	0.043	0.083
0.600								
0.650								
0.700	88	20	68	138,808	121,729	156,190	0.019	0.162
0.750								
0.800	90	20	70	142,161	124,686	159,943	0.008	0.270
0.850	92	20	72	145,511	127,614	163,752	0.003	0.407
0.900	94	22	72	148,098	129,915	166,785	0.001	0.518
0.950	96	22	74	151,451	132,888	170,515	0.000	0.658
1.000	108	24	84	170,803	149,922	192,296	0.000	0.985

Twisp Spring Chinook Program

30,000	Broodstock							
P ≥ Target	Total	Hatchery	Wild	Mean Production	Lower 95% CI	Upper 95% CI	P < 90% of Target	P > 110% of Target
0.400	20	14	6	29,842	21,756	39,279	0.274	0.230
0.450								
0.500								
0.550								
0.600								
0.650	22	16	6	32,640	23,805	42,914	0.117	0.449
0.700								
0.750								
0.800								
0.850	24	18	6	35,544	25,854	46,590	0.043	0.667
0.900	26	18	8	38,690	28,373	50,410	0.011	0.843
0.950	28	20	8	41,663	30,540	54,200	0.003	0.929
1.000	36	26	10	53,126	38,789	69,474	0.000	0.998

Twisp Steelhead Program

48,000	Broodstock							
P ≥ Target	Total	Hatchery	Wild	Mean Production	Lower 95% CI	Upper 95% CI	P < 90% of Target	P > 110% of Target
0.400								
0.450	24	0	24	47,964	31,700	64,929	0.291	0.281
0.500								
0.550								
0.600								
0.650	26	0	26	51,804	34,327	70,092	0.173	0.452
0.700								
0.750	28	0	28	55,688	37,001	75,296	0.099	0.613
0.800								
0.850	30	0	30	59,568	39,567	80,415	0.056	0.737
0.900	32	0	32	63,475	42,112	85,653	0.031	0.830
0.950	34	0	34	67,385	44,751	90,809	0.018	0.894
1.000	54	0	54	106,877	71,227	144,059	0.000	0.999

Methow Safety Net Steelhead Program

100,000	Broodstock							
P ≥ Target	Total	Hatchery	Wild	Mean Production	Lower 95% CI	Upper 95% CI	P < 90% of Target	P > 110% of Target
0.400								
0.450	50	50	0	97,856	65,366	130,213	0.319	0.231
0.500	52	52	0	101,757	67,953	135,499	0.247	0.313
0.550								
0.600	54	54	0	105,666	70,586	140,545	0.191	0.403
0.650	56	56	0	109,580	73,040	145,867	0.146	0.497
0.700								
0.750	58	58	0	113,503	75,695	151,201	0.114	0.573
0.800	60	60	0	117,442	78,134	156,425	0.085	0.647
0.850	62	62	0	121,363	80,772	161,527	0.065	0.710
0.900	66	66	0	129,222	86,207	171,676	0.035	0.811
0.950	72	72	0	140,956	93,792	187,409	0.016	0.903
1.000	110	110	0	215,360	143,932	285,909	0.000	0.999

Columbia Safety Net Steelhead Program

160,000	Broodstock							
P ≥ Target	Total	Hatchery	Wild	Mean Production	Lower 95% CI	Upper 95% CI	P < 90% of Target	P > 110% of Target
0.400								
0.450	80	80	0	157,293	105,351	210,105	0.315	0.239
0.500	82	82	0	161,226	108,123	215,291	0.270	0.295
0.550	84	84	0	165,178	110,766	220,541	0.230	0.351
0.600	86	86	0	169,124	113,325	225,907	0.194	0.405
0.650	88	88	0	173,063	116,024	230,892	0.164	0.459
0.700	90	90	0	176,988	118,613	236,320	0.137	0.509
0.750	94	94	0	184,852	123,931	246,752	0.096	0.607
0.800	96	96	0	188,797	126,532	252,116	0.080	0.651
0.850	100	100	0	196,646	131,396	262,742	0.054	0.727
0.900	104	104	0	204,498	136,641	273,466	0.039	0.789
0.950	112	112	0	220,241	147,341	294,347	0.019	0.881
1.000	184	184	0	361,824	242,174	483,102	0.000	0.999

Wells Yearling Summer Chinook Program

	Broodstock							
P ≥ Target	Total	Hatchery	Wild	Mean Production	Lower 95% CI	Upper 95% CI	P < 90% of Target	P > 110% of Target
0.400								
0.450	174	156	18	317,141	267,361	370,040	0.130	0.093
0.500	176	158	18	320,783	270,348	374,158	0.105	0.122
0.550	178	160	18	324,426	273,432	378,576	0.083	0.151
0.600	180	162	18	328,062	276,524	382,968	0.066	0.184
0.650	182	162	20	331,695	279,703	386,710	0.050	0.223
0.700	186	166	20	338,961	285,837	395,423	0.030	0.311
0.750	188	168	20	342,598	288,651	399,822	0.023	0.361
0.800	190	170	20	346,228	291,736	404,104	0.018	0.409
0.850	194	174	20	353,486	297,901	412,748	0.011	0.505
0.900	198	178	20	360,764	304,101	421,065	0.006	0.603
0.950	204	182	22	371,551	313,390	433,532	0.002	0.731
1.000	236	212	24	429,470	362,381	500,821	0.000	0.987

Wells SubYearling Summer Chinook Program

484,000	Broodstock							
P ≥ Target	Total	Hatchery	Wild	Mean Production	Lower 95% CI	Upper 95% CI	P < 90% of Target	P > 110% of Target
0.400	288	258	30	476,646	397,146	560,488	0.161	0.092
0.450	290	260	30	479,960	399,903	564,105	0.142	0.107
0.500	294	264	30	486,569	405,554	572,182	0.110	0.138
0.550	298	268	30	493,190	410,895	580,069	0.084	0.179
0.600	300	270	30	496,500	413,675	583,963	0.074	0.200
0.650	304	272	32	502,985	418,802	591,362	0.056	0.247
0.700	308	276	32	509,597	424,311	599,167	0.042	0.300
0.750	312	280	32	516,206	430,048	607,069	0.032	0.354
0.800	316	284	32	522,824	435,426	615,037	0.025	0.409
0.850	322	288	34	532,648	443,716	626,928	0.015	0.493
0.900	330	296	34	545,870	454,567	642,480	0.009	0.602
0.950	340	306	34	562,430	468,602	661,238	0.003	0.727
1.000	394	354	40	651,666	542,729	765,884	0.000	0.985