

APPENDIX 3.A

Snake River Anadromous Fish Run Size and Harvest Forecasts

Spring/Summer Chinook

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement: Definitions and Equations
Species: Spring/Summer Chinook
Date: September 2, 1999

Equation	Variable	Definition
[]	Point Estimates <ul style="list-style-type: none"> • Equal weights • Mean of experts 	Sum of seven index stocks Average of the sum of the seven index stocks for the four expert estimates
[1]	Index wild ocean escapement <ul style="list-style-type: none"> • Year 0 • Future years 	Share (51.6%) of total wild ocean escapement based on action A1 year 5 index wild ocean escapement divided by 10-year total wild ocean escapement from TAC (1997); (see [25]) PATH results: mainstem harvest ÷ mainstem harvest rate
[2]	Index wild ocean harvest	Assumed to be zero
[3]	Index wild mainstem harvest <ul style="list-style-type: none"> • Year 0 • Future Years 	Action A1 year 5 PATH results
[4]	Index wild tributary harvest <ul style="list-style-type: none"> • Year 0 • Future Years 	Action A1 year 5 PATH results
[5]	Index wild in-river harvest	[3] + [4]
[6]	Index wild total harvest	[2] + [5]
[7]	Index wild pre-spawning mortality rate	[8] * 10%
[8]	Index wild LWG escapement	([4] + [9]) ÷ 90%
[9]	Index wild spawners <ul style="list-style-type: none"> • Year 0 • Future years 	Action A1, Year 5 PATH results
[10]	Index wild total adults	[6] + [7] + [9]
[11]	Index wild egg production	[9] ÷ 2 * 3,500
[12]	Index wild smolt production	Based on fecundity function dependent on spawners
[13]	Index wild SAR	[10] ÷ [12] _(lagged 5 years)
[14]	Index wild SAR change <ul style="list-style-type: none"> • Year 5 • Future years 	Change in index wild SAR between year 5 and year 10 Change in index wild SAR over previous 5 years
[15]	Other wild ocean escapement	[25] - [1]
[16]	Other wild ocean harvest	Assumed to be zero

[17-18]	Other wild	Same proportion as compared to PATH results LWG escapement
	<ul style="list-style-type: none"> • Main stem harvest • Tributaries harvest 	
[21-23]	<ul style="list-style-type: none"> • Pre-spawning • LWG escapement • Spawners 	
[19]	Other wild in-river harvest	[17] + [18]
[20]	Other wild total harvest	[16] + [19]
[24]	Other wild total adults	[20] + [21] + [23]
[25]	Total wild ocean escapement	
	<ul style="list-style-type: none"> • Year 0 • Future years 	Columbia River run size average for 1986 – 1995. Tab 1, Table 2 and Tab 2, Table 2, TAC (1997) Change in PATH ocean escapement
[26-28]	Total wild harvest	(index wild stock) + (other wild)
	<ul style="list-style-type: none"> • Ocean Harvest • Main stem harvest • Tributary harvest 	
[29]	Total wild in-river harvest	[27] + [28]
[30]	Total harvest	[26] + [27] + [28]
[31-33]	Total wild stocks	(index wild) + (other wild)
	<ul style="list-style-type: none"> • Pre-spawning mortality • LWG escapement • Spawners 	
[34]	Total wild total adults	[30] + [31] + [33]
[35]	SAR change applied to hatchery stocks	[14]
[36]	Hatchery production	Smolt releases from personal communications with Steve Smith, NMFS (1998). Future years are same as Year 0
[37]	Hatchery SAR	
	<ul style="list-style-type: none"> • Year 0 • Future years 	1986-1995 average; SAR from CWT Missing Production Groups Annual Reports (NMFS, IDFW) Same rate change as wild total adults to PATH wild spawners and supplements lagged 5 years
[38]	Hatchery total adults	[36] * [37]
[39]	Hatchery ocean escapement	[38] * ([1] ÷ [10])
[40]	Hatchery ocean harvest	Assumed to be zero
[41]	Hatchery in-river harvest	[38] * ([5] ÷ [10])

[42]	Hatchery mainstem harvest	$[38] * ([3] \div [10])$
[43]	Hatchery tributary harvest	$[38] * ([4] \div [10])$
[44]	Hatchery total harvest	$[40] + [41]$
[45]	Hatchery requirements	$[36] \div 3,500 * 3$; i.e. it takes 3 adults to generate a typical hatch with a fecundity of 3,500 eggs
[46]	Hatchery surplus	$[36] - [43] - [44]$

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project

Statement: Wild spring/summer chinook PATH index stocks

Data: PATH Results October 1998

Filter: "equal weights"

Action: A1

Date: October 8, 1999

PATH Index Stocks																	
Year	(1)	(2)	(3)	(4)			(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)
	Ocean	Ocean	Mainstem	Tributaries	Inriver	Total	Pre-spawning	Mortality	Escapement	Spawners	Total Adults	Production	Eggs	Smolts	5 year	Adult Survival	Rate Change
0	4,474	0	386	152	537	537	285	2,850	2,413	3,236	4,223,613	629,991					
5	6,048	0	386	152	537	537	285	2,850	2,413	3,236	4,223,613	629,991			0.5%	-70.6%	
10	8,932	0	927	169	1,097	1,097	392	3,923	3,361	4,850	5,882,340	185,485			0.8%	49.9%	
15	11,062	0	1,489	209	1,698	1,698	462	4,617	3,946	6,106	6,905,241	163,769			3.3%	327.6%	
20	13,418	0	2,073	289	2,362	2,362	523	5,230	4,418	7,303	7,732,205	155,796			4.5%	35.5%	
25	13,047	0	2,042	296	2,338	2,338	513	5,129	4,320	7,171	7,559,185	157,079			4.6%	3.2%	
30	13,691	0	2,181	327	2,508	2,508	524	5,244	4,392	7,425	7,686,253	156,121			4.7%	2.7%	
35	14,924	0	2,563	394	2,957	2,957	571	5,713	4,747	8,275	8,307,790	152,525			5.3%	12.1%	
40	14,538	0	2,487	378	2,865	2,865	561	5,609	4,670	8,096	8,172,393	153,177			5.3%	0.1%	
45	13,876	0	2,310	352	2,661	2,661	534	5,344	4,458	7,653	7,800,920	155,330			5.0%	-5.9%	
50	12,963	0	2,170	299	2,468	2,468	522	5,221	4,400	7,390	7,699,620	156,025			4.8%	-4.8%	
55	12,945	0	2,177	299	2,476	2,476	523	5,232	4,409	7,409	7,716,478	155,906			4.7%	-0.2%	
60	12,034	0	1,885	260	2,145	2,145	488	4,884	4,136	6,769	7,237,342	159,954			4.3%	-8.6%	
65	11,825	0	1,823	257	2,080	2,080	480	4,803	4,065	6,626	7,114,450	161,252			4.1%	-4.6%	
70	12,818	0	2,113	295	2,408	2,408	516	5,159	4,348	7,271	7,608,391	156,697			4.5%	8.9%	
75	12,747	0	2,141	293	2,434	2,434	518	5,185	4,373	7,326	7,652,988	156,363			4.7%	3.7%	
80	13,772	0	2,315	340	2,655	2,655	533	5,330	4,457	7,645	7,799,398	155,340			4.9%	4.6%	
85	13,878	0	2,346	353	2,699	2,699	537	5,373	4,483	7,719	7,844,810	155,044			5.0%	1.6%	
90	15,173	0	2,717	420	3,137	3,137	583	5,827	4,825	8,545	8,443,711	151,933			5.5%	10.9%	
95	14,786	0	2,612	400	3,011	3,011	570	5,702	4,732	8,314	8,281,811	152,645			5.5%	-0.7%	
100	14,007	0	2,401	367	2,768	2,768	544	5,441	4,530	7,842	7,927,698	154,529			5.1%	-6.1%	

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Other wild spring/summer chinook stocks
Action: A1
Date: October 8, 1999

Year	Other Wild Stocks									
	(15) Ocean Escapement	(16) Ocean	(17) Mainstem	(18) Harvest Tributary	(19) Inriver	(20) Total	(21) Pre-spawning Mortality	(22) LWG Escapement	(23) Spawners	(24) Total Adult
0	4,203	0	362	142	505	505	268	2,678	2,267	2,772
5	9,807	0	625	246	871	871	462	4,622	3,914	4,785
10	14,485	0	1,504	275	1,778	1,778	636	6,361	5,451	7,229
15	17,938	0	2,415	339	2,754	2,754	749	7,487	6,399	9,153
20	21,758	0	3,361	468	3,830	3,830	848	8,481	7,165	10,995
25	21,157	0	3,311	481	3,792	3,792	832	8,317	7,005	10,796
30	22,201	0	3,536	531	4,067	4,067	850	8,504	7,122	11,190
35	24,200	0	4,155	639	4,794	4,794	926	9,263	7,698	12,493
40	23,575	0	4,033	613	4,646	4,646	910	9,095	7,573	12,219
45	22,501	0	3,745	570	4,315	4,315	867	8,665	7,229	11,544
50	21,022	0	3,518	484	4,002	4,002	847	8,466	7,135	11,137
55	20,991	0	3,530	486	4,016	4,016	848	8,484	7,150	11,166
60	19,514	0	3,057	422	3,479	3,479	792	7,920	6,706	10,185
65	19,175	0	2,956	417	3,373	3,373	779	7,789	6,592	9,966
70	20,786	0	3,426	479	3,905	3,905	837	8,365	7,050	10,955
75	20,670	0	3,471	476	3,947	3,947	841	8,408	7,091	11,039
80	22,332	0	3,754	552	4,306	4,306	864	8,644	7,227	11,533
85	22,505	0	3,804	573	4,377	4,377	871	8,714	7,269	11,646
90	24,605	0	4,406	680	5,087	5,087	945	9,450	7,824	12,911
95	23,977	0	4,235	648	4,883	4,883	925	9,247	7,674	12,558
100	22,714	0	3,894	595	4,489	4,489	882	8,823	7,346	11,835

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Total wild spring/summer chinook stocks
Action: A1
Date: October 8, 1999

Total Wild Stocks										
	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Ocean			Harvest			Pre-spawning	LWG		
Year	Escapement	Ocean	Mainstem	Tributary	Inriver	Total	Mortality	Escapement	Spawners	Total Adults
0	11,730	0	748	294	1,042	1,042	553	5,528	4,681	5,723
5	15,854	0	1,011	397	1,409	1,409	747	7,472	6,327	7,736
10	23,417	0	2,431	444	2,875	2,875	1,028	10,284	8,812	11,687
15	28,999	0	3,904	549	4,453	4,453	1,210	12,103	10,344	14,797
20	35,176	0	5,434	757	6,192	6,192	1,371	13,712	11,583	17,775
25	34,204	0	5,353	777	6,130	6,130	1,345	13,446	11,324	17,454
30	35,892	0	5,717	858	6,576	6,576	1,375	13,747	11,514	18,090
35	39,124	0	6,718	1,033	7,751	7,751	1,498	14,976	12,446	20,196
40	38,113	0	6,521	991	7,512	7,512	1,470	14,704	12,243	19,754
45	36,378	0	6,055	922	6,976	6,976	1,401	14,009	11,686	18,663
50	33,985	0	5,688	783	6,471	6,471	1,369	13,686	11,534	18,005
55	33,936	0	5,707	785	6,492	6,492	1,372	13,716	11,560	18,052
60	31,548	0	4,942	682	5,624	5,624	1,280	12,805	10,842	16,466
65	30,999	0	4,779	675	5,453	5,453	1,259	12,592	10,658	16,111
70	33,603	0	5,539	774	6,312	6,312	1,352	13,524	11,398	17,710
75	33,417	0	5,612	769	6,381	6,381	1,359	13,593	11,465	17,846
80	36,104	0	6,068	892	6,961	6,961	1,397	13,974	11,684	18,645
85	36,383	0	6,149	926	7,076	7,076	1,409	14,087	11,752	18,828
90	39,779	0	7,124	1,100	8,224	8,224	1,528	15,277	12,649	20,873
95	38,762	0	6,847	1,048	7,895	7,895	1,495	14,949	12,407	20,301
100	36,722	0	6,295	962	7,257	7,257	1,426	14,264	11,876	19,133

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Hatchery spring/summer chinook
Action: A1
Date: October 8, 1999

Year	Hatchery Stocks											
	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)	(46)
	SAR	Production	Survival Rate	Total Adults	Ocean Escapement	Ocean	Inriver	Harvest Mainstem	Tributary	Total	Requirements	Surplus
0	--	2,202,224	0.25%	5,506	7,613	0	914	656	258	914	1,888	2,704
5	-70.6%	2,202,224	0.07%	1,621	3,030	0	269	193	76	269	1,888	-536
10	49.9%	2,202,224	0.11%	2,430	4,475	0	549	464	85	549	1,888	-7
15	327.6%	2,202,224	0.47%	10,389	18,821	0	2,890	2,534	356	2,890	1,888	5,612
20	35.5%	2,202,224	0.64%	14,074	25,857	0	4,551	3,995	557	4,551	1,888	7,635
25	3.2%	2,202,224	0.66%	14,526	26,429	0	4,737	4,136	601	4,737	1,888	7,901
30	2.7%	2,202,224	0.68%	14,917	27,507	0	5,039	4,382	658	5,039	1,888	7,990
35	12.1%	2,202,224	0.76%	16,728	30,168	0	5,977	5,180	796	5,977	1,888	8,864
40	0.1%	2,202,224	0.76%	16,752	30,081	0	5,929	5,146	782	5,929	1,888	8,936
45	-5.9%	2,202,224	0.72%	15,768	28,589	0	5,483	4,758	724	5,483	1,888	8,398
50	-4.8%	2,202,224	0.68%	15,015	26,339	0	5,015	4,408	607	5,015	1,888	8,112
55	-0.2%	2,202,224	0.68%	14,986	26,184	0	5,009	4,403	606	5,009	1,888	8,090
60	-8.6%	2,202,224	0.62%	13,703	24,360	0	4,343	3,816	527	4,343	1,888	7,473
65	-4.6%	2,202,224	0.59%	13,073	23,330	0	4,104	3,597	508	4,104	1,888	7,081
70	8.9%	2,202,224	0.65%	14,231	25,087	0	4,712	4,135	578	4,712	1,888	7,631
75	3.7%	2,202,224	0.67%	14,754	25,673	0	4,902	4,312	591	4,902	1,888	7,964
80	4.6%	2,202,224	0.70%	15,430	27,796	0	5,359	4,672	687	5,359	1,888	8,184
85	1.6%	2,202,224	0.71%	15,682	28,195	0	5,483	4,765	718	5,483	1,888	8,311
90	10.9%	2,202,224	0.79%	17,393	30,886	0	6,385	5,531	854	6,385	1,888	9,120
95	-0.7%	2,202,224	0.78%	17,270	30,713	0	6,255	5,425	830	6,255	1,888	9,127
100	-6.1%	2,202,224	0.74%	16,214	28,960	0	5,723	4,965	759	5,723	1,888	8,603

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project

Statement: Wild spring/summer chinook PATH index stocks

Data: PATH Results October 1998

Filter: "equal weights"

Action: A2

Date: October 8, 1999

PATH Index Stocks																
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)
	Ocean			Harvest				Pre-spawning	LWG			Production			5 year	Adult Survival
Year	Escapement	Ocean	Mainstem	Tributaries	Inriver	Total	Total	Mortality	Escapement	Spawners	Total Adults	Eggs	Smolts		Rates	Rate Change
0	4,474	0	386	152	537	537	537	285	2,850	2,413	3,236	4,223,613	629,991			
5	6,133	0	431	163	594	594	594	312	3,119	2,645	3,551	4,627,974	308,112	0.6%		-51.1%
10	8,911	0	1,019	182	1,201	1,201	1,201	423	4,231	3,627	5,250	6,346,443	173,094	1.7%		202.4%
15	11,078	0	1,539	209	1,748	1,748	1,748	492	4,922	4,220	6,461	7,385,622	158,543	3.7%		119.0%
20	13,914	0	2,356	320	2,675	2,675	2,675	577	5,774	4,877	8,130	8,535,222	151,567	5.1%		37.4%
25	13,532	0	2,271	319	2,590	2,590	2,590	559	5,595	4,716	7,865	8,253,005	152,781	5.2%		1.2%
30	14,094	0	2,352	339	2,691	2,691	2,691	568	5,684	4,777	8,036	8,359,762	152,292	5.3%		1.4%
35	14,866	0	2,703	393	3,096	3,096	3,096	609	6,095	5,092	8,797	8,910,590	150,298	5.8%		9.8%
40	14,395	0	2,585	369	2,953	2,953	2,953	596	5,957	4,992	8,541	8,736,838	150,841	5.7%		-1.6%
45	13,966	0	2,425	348	2,774	2,774	2,774	573	5,733	4,812	8,159	8,420,575	152,030	5.4%		-4.8%
50	12,046	0	2,013	259	2,272	2,272	2,272	536	5,357	4,562	7,370	7,983,669	154,198	4.8%		-10.4%
55	12,043	0	2,046	261	2,306	2,306	2,306	539	5,390	4,590	7,435	8,032,892	153,918	4.8%		-0.5%
60	11,553	0	1,787	236	2,023	2,023	2,023	508	5,085	4,340	6,872	7,595,759	156,794	4.5%		-7.4%
65	11,632	0	1,771	238	2,009	2,009	2,009	503	5,033	4,292	6,804	7,510,464	157,471	4.3%		-2.8%
70	11,990	0	1,975	257	2,232	2,232	2,232	531	5,311	4,523	7,287	7,915,367	154,603	4.6%		6.6%
75	12,038	0	2,014	259	2,274	2,274	2,274	536	5,359	4,563	7,373	7,985,841	154,185	4.8%		3.1%
80	13,901	0	2,379	330	2,710	2,710	2,710	571	5,713	4,811	8,092	8,419,458	152,035	5.2%		10.1%
85	14,053	0	2,448	354	2,802	2,802	2,802	575	5,754	4,825	8,202	8,442,946	151,936	5.4%		2.8%
90	14,904	0	2,770	404	3,174	3,174	3,174	616	6,159	5,139	8,929	8,993,769	150,063	5.9%		8.9%
95	14,521	0	2,677	384	3,061	3,061	3,061	604	6,037	5,049	8,713	8,835,508	150,524	5.8%		-1.2%
100	14,079	0	2,480	354	2,835	2,835	2,835	580	5,796	4,862	8,276	8,508,101	151,673	5.5%		-5.3%

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study

Statement: Other wild spring/summer chinook stocks

Action: A2

Date: October 8, 1999

Other Wild Stocks										
	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
	Ocean			Harvest			Pre-spawning	LWG		
Year	Escapement	Ocean	Mainstem	Tributary	Inriver	Total	Mortality	Escapement	Spawners	Total Adult
0	4,203	0	362	142	505	505	268	2,678	2,267	2,772
5	9,946	0	699	264	963	963	506	5,058	4,288	5,252
10	14,451	0	1,653	295	1,947	1,947	686	6,861	5,881	7,828
15	17,964	0	2,495	339	2,835	2,835	798	7,981	6,844	9,678
20	22,564	0	3,820	518	4,338	4,338	936	9,364	7,909	12,247
25	21,944	0	3,682	518	4,200	4,200	907	9,072	7,647	11,847
30	22,854	0	3,815	549	4,364	4,364	922	9,217	7,746	12,110
35	24,107	0	4,383	638	5,021	5,021	988	9,883	8,257	13,278
40	23,344	0	4,191	598	4,789	4,789	966	9,659	8,096	12,885
45	22,647	0	3,933	564	4,498	4,498	930	9,297	7,803	12,300
50	19,534	0	3,265	420	3,685	3,685	869	8,687	7,398	11,083
55	19,529	0	3,317	423	3,740	3,740	874	8,740	7,444	11,183
60	18,735	0	2,898	383	3,280	3,280	825	8,246	7,038	10,319
65	18,862	0	2,872	386	3,258	3,258	816	8,162	6,959	10,217
70	19,442	0	3,203	417	3,620	3,620	861	8,613	7,335	10,955
75	19,521	0	3,266	421	3,687	3,687	869	8,690	7,400	11,087
80	22,542	0	3,858	536	4,394	4,394	926	9,264	7,802	12,196
85	22,789	0	3,969	575	4,544	4,544	933	9,331	7,823	12,367
90	24,169	0	4,491	655	5,146	5,146	999	9,988	8,334	13,480
95	23,547	0	4,341	623	4,963	4,963	979	9,789	8,187	13,150
100	22,831	0	4,022	575	4,597	4,597	940	9,398	7,884	12,480

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Total wild spring/summer chinook stocks
Action: A2
Date: October 8, 1999

Total Wild Stocks										
	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Ocean			Harvest			Pre-spawning	LWG		
Year	Escapement	Ocean	Mainstem	Tributary	Inriver	Total	Mortality	Escapement	Spawners	Total Adults
0	11,730	0	748	294	1,042	1,042	553	5,528	4,681	5,723
5	16,080	0	1,131	427	1,557	1,557	818	8,177	6,933	8,490
10	23,362	0	2,672	476	3,148	3,148	1,109	11,093	9,507	12,655
15	29,042	0	4,034	548	4,583	4,583	1,290	12,903	11,064	15,647
20	36,478	0	6,176	838	7,013	7,013	1,514	15,138	12,786	19,800
25	35,476	0	5,953	837	6,790	6,790	1,467	14,667	12,363	19,153
30	36,948	0	6,167	888	7,055	7,055	1,490	14,901	12,523	19,578
35	38,973	0	7,086	1,031	8,117	8,117	1,598	15,977	13,349	21,466
40	37,739	0	6,776	966	7,742	7,742	1,562	15,616	13,088	20,831
45	36,613	0	6,359	913	7,271	7,271	1,503	15,030	12,615	19,886
50	31,580	0	5,278	680	5,957	5,957	1,404	14,044	11,960	17,917
55	31,572	0	5,363	683	6,046	6,046	1,413	14,130	12,034	18,080
60	30,289	0	4,684	618	5,303	5,303	1,333	13,330	11,379	16,682
65	30,493	0	4,643	624	5,267	5,267	1,319	13,195	11,251	16,518
70	31,432	0	5,178	674	5,852	5,852	1,392	13,924	11,858	17,710
75	31,559	0	5,281	680	5,961	5,961	1,405	14,048	11,963	17,924
80	36,443	0	6,238	866	7,104	7,104	1,498	14,976	12,613	19,717
85	36,842	0	6,417	929	7,346	7,346	1,509	15,085	12,648	19,994
90	39,073	0	7,261	1,059	8,320	8,320	1,615	16,147	13,473	21,793
95	38,068	0	7,017	1,007	8,024	8,024	1,583	15,825	13,236	21,260
100	36,911	0	6,502	929	7,431	7,431	1,519	15,194	12,746	20,177

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Hatchery spring/summer chinook
Action: A2
Date: October 8, 1999

Year	Hatchery Stocks												
	(35) SAR Change	(36) Production	(37) Adult Survival Rate	(38) Total Adults	(39) Ocean Escapement	(40) Ocean	(41) Inriver	(42) Harvest			(43) Tributary	(44) Total	(45) Requirements
0	--	2,202,224	0.25%	5,506	7,613	0	914	656	258	914	1,888	2,704	
5	-51.1%	2,202,224	0.12%	2,693	4,651	0	451	327	123	451	1,888	354	
10	202.4%	2,202,224	0.37%	8,141	13,818	0	1,862	1,580	282	1,862	1,888	4,392	
15	119.0%	2,202,224	0.81%	17,832	30,577	0	4,825	4,247	577	4,825	1,888	11,120	
20	37.4%	2,202,224	1.11%	24,499	41,931	0	8,062	7,099	963	8,062	1,888	14,550	
25	1.2%	2,202,224	1.13%	24,793	42,656	0	8,164	7,158	1,006	8,164	1,888	14,742	
30	1.4%	2,202,224	1.14%	25,131	44,072	0	8,415	7,356	1,059	8,415	1,888	14,828	
35	9.8%	2,202,224	1.25%	27,599	46,637	0	9,713	8,479	1,234	9,713	1,888	15,998	
40	-1.6%	2,202,224	1.23%	27,151	45,759	0	9,388	8,216	1,172	9,388	1,888	15,876	
45	-4.8%	2,202,224	1.17%	25,841	44,234	0	8,785	7,682	1,103	8,785	1,888	15,169	
50	-10.4%	2,202,224	1.05%	23,161	37,855	0	7,141	6,327	815	7,141	1,888	14,133	
55	-0.5%	2,202,224	1.05%	23,038	37,314	0	7,146	6,338	807	7,146	1,888	14,005	
60	-7.4%	2,202,224	0.97%	21,330	35,862	0	6,279	5,546	732	6,279	1,888	13,163	
65	-2.8%	2,202,224	0.94%	20,732	35,442	0	6,121	5,396	725	6,121	1,888	12,723	
70	6.6%	2,202,224	1.00%	22,107	36,376	0	6,773	5,993	780	6,773	1,888	13,447	
75	3.1%	2,202,224	1.03%	22,784	37,201	0	7,026	6,225	802	7,026	1,888	13,870	
80	10.1%	2,202,224	1.14%	25,074	43,074	0	8,396	7,373	1,024	8,396	1,888	14,790	
85	2.8%	2,202,224	1.17%	25,775	44,162	0	8,805	7,692	1,113	8,805	1,888	15,082	
90	8.9%	2,202,224	1.27%	28,077	46,867	0	9,979	8,709	1,270	9,979	1,888	16,210	
95	-1.2%	2,202,224	1.26%	27,741	46,231	0	9,745	8,522	1,223	9,745	1,888	16,109	
100	-5.3%	2,202,224	1.19%	26,268	44,688	0	8,997	7,872	1,125	8,997	1,888	15,383	

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project

Statement: Wild spring/summer chinook PATH index stocks

Data: PATH Results October 1998

Filter: "equal weights"

Action: A3

Date: October 8, 1999

PATH Index Stocks																	
Year	(1)	(2)	(3)	(4)			(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)
	Ocean	Ocean	Mainstem	Harvest			Inriver	Total	Pre-spawning Mortality	LWG Escapement	Spawners	Total Adults	Production		Smolts	5 year Rates	Adult Survival Rate Change
0	4,474	0	386	152	537	537	537	285	2,850	2,413	3,236	4,223,613	629,991				
5	5,929	0	434	179	613	613	613	328	3,279	2,772	3,713	4,851,020	261,062		0.6%	-58.6%	
10	8,707	0	1,019	197	1,216	1,216	1,216	449	4,487	3,841	5,506	6,722,034	166,352		2.1%	257.9%	
15	10,573	0	1,574	225	1,799	1,799	1,799	520	5,198	4,453	6,772	7,793,335	155,380		4.1%	93.0%	
20	13,181	0	2,347	323	2,670	2,670	2,670	600	6,004	5,080	8,351	8,890,212	150,358		5.4%	32.0%	
25	12,840	0	2,270	326	2,595	2,595	2,595	582	5,819	4,912	8,089	8,595,491	151,338		5.4%	0.1%	
30	13,160	0	2,357	347	2,703	2,703	2,703	589	5,885	4,950	8,242	8,662,104	151,097		5.4%	1.2%	
35	14,179	0	2,747	407	3,153	3,153	3,153	636	6,359	5,316	9,106	9,303,868	149,310		6.0%	10.7%	
40	13,743	0	2,639	386	3,025	3,025	3,025	623	6,230	5,221	8,870	9,137,334	149,691		5.9%	-1.4%	
45	13,192	0	2,447	362	2,809	2,809	2,809	598	5,981	5,021	8,428	8,786,811	150,678		5.6%	-5.2%	
50	11,666	0	2,116	273	2,390	2,390	2,390	567	5,665	4,825	7,781	8,444,149	151,931		5.2%	-8.3%	
55	11,737	0	2,137	276	2,413	2,413	2,413	570	5,696	4,850	7,833	8,487,931	151,753		5.2%	-0.2%	
60	10,836	0	1,869	252	2,122	2,122	2,122	536	5,363	4,574	7,232	8,004,497	154,078		4.8%	-7.6%	
65	10,811	0	1,820	251	2,071	2,071	2,071	528	5,282	4,503	7,102	7,880,474	154,818		4.6%	-3.3%	
70	11,550	0	2,075	275	2,350	2,350	2,350	561	5,606	4,771	7,681	8,348,994	152,340		5.0%	7.6%	
75	11,675	0	2,118	277	2,395	2,395	2,395	567	5,671	4,827	7,788	8,446,708	151,921		5.1%	3.0%	
80	12,992	0	2,419	340	2,759	2,759	2,759	595	5,947	5,012	8,366	8,771,839	150,726		5.5%	7.7%	
85	13,224	0	2,472	363	2,834	2,834	2,834	599	5,986	5,024	8,457	8,792,625	150,659		5.6%	1.9%	
90	14,301	0	2,831	418	3,250	3,250	3,250	643	6,433	5,371	9,264	9,399,514	149,113		6.1%	9.6%	
95	13,805	0	2,711	395	3,107	3,107	3,107	630	6,298	5,273	9,009	9,227,328	149,478		6.0%	-1.7%	
100	13,252	0	2,503	368	2,872	2,872	2,872	603	6,033	5,062	8,537	8,857,833	150,455		5.7%	-5.5%	

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Other wild spring/summer chinook stocks
Action: A3
Date: October 8, 1999

Other Wild Stocks										
	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
	Ocean			Harvest			Pre-spawning	LWG		
Year	Escapement	Ocean	Mainstem	Tributary	Inriver	Total	Mortality	Escapement	Spawners	Total Adult
0	4,203	0	362	142	505	505	268	2,678	2,267	2,772
5	9,615	0	704	290	994	994	532	5,317	4,495	5,489
10	14,119	0	1,652	320	1,972	1,972	728	7,276	6,229	8,201
15	17,146	0	2,553	365	2,917	2,917	843	8,429	7,222	10,139
20	21,374	0	3,805	524	4,330	4,330	974	9,736	8,238	12,568
25	20,822	0	3,680	528	4,208	4,208	944	9,437	7,965	12,173
30	21,340	0	3,821	562	4,384	4,384	954	9,543	8,027	12,410
35	22,992	0	4,454	659	5,113	5,113	1,031	10,312	8,621	13,734
40	22,286	0	4,280	626	4,906	4,906	1,010	10,103	8,467	13,373
45	21,393	0	3,968	587	4,555	4,555	970	9,699	8,142	12,697
50	18,917	0	3,432	443	3,875	3,875	919	9,187	7,825	11,700
55	19,033	0	3,466	448	3,914	3,914	924	9,237	7,865	11,779
60	17,572	0	3,031	409	3,441	3,441	870	8,696	7,417	10,858
65	17,532	0	2,951	407	3,358	3,358	857	8,565	7,302	10,660
70	18,729	0	3,366	445	3,811	3,811	909	9,091	7,736	11,547
75	18,931	0	3,434	449	3,883	3,883	920	9,196	7,827	11,710
80	21,067	0	3,922	552	4,474	4,474	964	9,644	8,128	12,602
85	21,444	0	4,008	588	4,596	4,596	971	9,706	8,148	12,744
90	23,191	0	4,591	679	5,270	5,270	1,043	10,432	8,710	13,980
95	22,387	0	4,397	641	5,038	5,038	1,021	10,213	8,550	13,588
100	21,490	0	4,059	597	4,657	4,657	978	9,784	8,208	12,865

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Total wild spring/summer chinook stocks
Action: A3
Date: October 8, 1999

Total Wild Stocks										
	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Ocean			Harvest			Pre-spawning	LWG		
Year	Escapement	Ocean	Mainstem	Tributary	Inriver	Total	Mortality	Escapement	Spawners	Total Adults
0	11,730	0	748	294	1,042	1,042	553	5,528	4,681	5,723
5	15,544	0	1,138	469	1,607	1,607	860	8,596	7,267	8,874
10	22,826	0	2,671	517	3,188	3,188	1,176	11,763	10,070	13,258
15	27,719	0	4,127	589	4,716	4,716	1,363	13,627	11,675	16,391
20	34,555	0	6,152	848	7,000	7,000	1,574	15,740	13,318	20,318
25	33,662	0	5,950	854	6,803	6,803	1,526	15,256	12,877	19,680
30	34,499	0	6,178	909	7,087	7,087	1,543	15,428	12,976	20,064
35	37,171	0	7,200	1,066	8,266	8,266	1,667	16,671	13,938	22,204
40	36,030	0	6,920	1,012	7,932	7,932	1,633	16,334	13,688	21,620
45	34,585	0	6,414	950	7,364	7,364	1,568	15,681	13,163	20,527
50	30,583	0	5,548	717	6,265	6,265	1,485	14,852	12,650	18,915
55	30,770	0	5,603	724	6,327	6,327	1,493	14,933	12,715	19,043
60	28,407	0	4,900	662	5,562	5,562	1,406	14,059	11,991	17,553
65	28,343	0	4,771	657	5,428	5,428	1,385	13,848	11,805	17,234
70	30,279	0	5,441	720	6,161	6,161	1,470	14,697	12,507	18,668
75	30,606	0	5,551	726	6,278	6,278	1,487	14,867	12,654	18,932
80	34,059	0	6,341	892	7,233	7,233	1,559	15,592	13,141	20,374
85	34,667	0	6,480	951	7,431	7,431	1,569	15,692	13,172	20,602
90	37,492	0	7,423	1,097	8,520	8,520	1,686	16,865	14,081	22,601
95	36,193	0	7,108	1,037	8,145	8,145	1,651	16,511	13,823	21,968
100	34,743	0	6,562	966	7,528	7,528	1,582	15,817	13,270	20,798

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Hatchery spring/summer chinook
Action: A3
Date: October 8, 1999

Year	Hatchery Stocks											
	(35) SAR Change	(36) Production	(37) Adult Survival Rate	(38) Total Adults	(39) Ocean Escapement	(40) Ocean	(41) Inriver	(42) Harvest Mainstem	(43) Tributary	(44) Total	(45) Requirements	(46) Surplus
0	--	2,202,224	0.25%	5,506	7,613	0	914	656	258	914	1,888	2,704
5	-58.6%	2,202,224	0.10%	2,281	3,643	0	377	267	110	377	1,888	17
10	257.9%	2,202,224	0.37%	8,164	12,911	0	1,803	1,511	292	1,803	1,888	4,473
15	93.0%	2,202,224	0.72%	15,759	24,605	0	4,187	3,663	523	4,187	1,888	9,685
20	32.0%	2,202,224	0.94%	20,804	32,839	0	6,652	5,847	805	6,652	1,888	12,265
25	0.1%	2,202,224	0.95%	20,825	33,058	0	6,681	5,843	838	6,681	1,888	12,256
30	1.2%	2,202,224	0.96%	21,081	33,661	0	6,915	6,028	887	6,915	1,888	12,279
35	10.7%	2,202,224	1.06%	23,328	36,326	0	8,078	7,037	1,042	8,078	1,888	13,362
40	-1.4%	2,202,224	1.04%	22,996	35,632	0	7,844	6,843	1,001	7,844	1,888	13,265
45	-5.2%	2,202,224	0.99%	21,796	34,116	0	7,264	6,327	937	7,264	1,888	12,644
50	-8.3%	2,202,224	0.91%	19,992	29,971	0	6,140	5,437	702	6,140	1,888	11,964
55	-0.2%	2,202,224	0.91%	19,959	29,905	0	6,149	5,445	704	6,149	1,888	11,922
60	-7.6%	2,202,224	0.84%	18,448	27,641	0	5,412	4,768	644	5,412	1,888	11,148
65	-3.3%	2,202,224	0.81%	17,843	27,162	0	5,202	4,572	630	5,202	1,888	10,753
70	7.6%	2,202,224	0.87%	19,207	28,879	0	5,876	5,189	686	5,876	1,888	11,443
75	3.0%	2,202,224	0.90%	19,791	29,666	0	6,085	5,381	704	6,085	1,888	11,818
80	7.7%	2,202,224	0.97%	21,318	33,104	0	7,030	6,163	867	7,030	1,888	12,400
85	1.9%	2,202,224	0.99%	21,721	33,962	0	7,279	6,348	931	7,279	1,888	12,554
90	9.6%	2,202,224	1.08%	23,804	36,746	0	8,350	7,275	1,075	8,350	1,888	13,566
95	-1.7%	2,202,224	1.06%	23,389	35,840	0	8,065	7,039	1,027	8,065	1,888	13,436
100	-5.5%	2,202,224	1.00%	22,107	34,320	0	7,437	6,483	954	7,437	1,888	12,783

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project

Statement: Wild spring/summer chinook PATH index stocks

Data: PATH Results October 1998

Filter: "equal weights"

Action: A4

Date: October 8, 1999

PATH Index Stocks																
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)
	Ocean			Harvest			Total	Pre-spawning	LWG		Total Adults	Production			5 year	Adult Survival
Year	Escapement	Ocean	Mainstem	Tributaries	Inriver			Mortality	Escapement	Spawners		Eggs	Smolts		Rates	Rate Change
0	4,474	0	386	152	537		537	285	2,850	2,413	3,236	4,223,613	629,991			
5	6,008	0	459	179	639		639	339	3,386	2,868	3,845	5,018,545	238,772	0.6%		-62.1%
10	8,969	0	1,126	201	1,327		1,327	478	4,782	4,103	5,908	7,179,851	160,546	2.5%		305.4%
15	11,642	0	1,915	258	2,172		2,172	619	6,187	5,311	8,102	9,294,147	149,331	5.0%		104.0%
20	15,599	0	3,452	488	3,940		3,940	849	8,486	7,149	11,938	12,511,054	148,041	8.0%		58.4%
25	17,547	0	4,556	709	5,265		5,265	973	9,726	8,044	14,282	14,076,567	149,439	9.6%		20.7%
30	19,738	0	5,581	969	6,550		6,550	1,090	10,895	8,836	16,476	15,463,686	151,121	11.0%		14.3%
35	21,935	0	6,480	1,246	7,726		7,726	1,199	11,988	9,543	18,468	16,700,362	152,826	12.2%		10.8%
40	21,317	0	6,290	1,230	7,520		7,520	1,178	11,775	9,368	18,065	16,393,891	152,390	11.8%		-3.3%
45	20,718	0	6,048	1,199	7,247		7,247	1,150	11,496	9,147	17,544	16,007,895	151,853	11.5%		-2.6%
50	20,849	0	6,075	1,228	7,303		7,303	1,156	11,556	9,173	17,631	16,052,167	151,914	11.6%		0.8%
55	20,790	0	6,054	1,243	7,296		7,296	1,154	11,544	9,147	17,597	16,006,503	151,851	11.6%		-0.2%
60	19,533	0	5,557	1,133	6,690		6,690	1,096	10,960	8,731	16,517	15,279,044	150,881	10.9%		-6.1%
65	19,645	0	5,564	1,147	6,711		6,711	1,097	10,972	8,728	16,536	15,273,589	150,874	11.0%		0.8%
70	21,063	0	6,155	1,308	7,463		7,463	1,172	11,719	9,239	17,874	16,168,542	152,075	11.8%		8.1%
75	20,775	0	6,058	1,287	7,345		7,345	1,160	11,599	9,152	17,657	16,015,900	151,864	11.6%		-2.0%
80	21,302	0	6,272	1,351	7,623		7,623	1,184	11,837	9,302	18,109	16,279,164	152,229	11.9%		2.7%
85	21,449	0	6,332	1,396	7,728		7,728	1,196	11,965	9,372	18,296	16,401,208	152,400	12.0%		0.8%
90	23,072	0	6,941	1,571	8,511		8,511	1,273	12,733	9,889	19,673	17,305,330	153,706	12.9%		7.4%
95	22,078	0	6,610	1,480	8,090		8,090	1,230	12,303	9,593	18,913	16,787,094	152,950	12.3%		-4.7%
100	21,230	0	6,258	1,378	7,636		7,636	1,185	11,849	9,286	18,107	16,250,796	152,189	11.8%		-3.8%

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Other wild spring/summer chinook stocks
Action: A4
Date: October 8, 1999

Other Wild Stocks										
	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
	Ocean			Harvest			Pre-spawning	LWG		
Year	Escapement	Ocean	Mainstem	Tributary	Inriver	Total	Mortality	Escapement	Spawners	Total Adult
0	4,203	0	362	142	505	505	268	2,678	2,267	2,772
5	9,742	0	745	291	1,036	1,036	549	5,490	4,650	5,686
10	14,544	0	1,826	325	2,151	2,151	775	7,754	6,653	8,804
15	18,879	0	3,105	418	3,523	3,523	1,003	10,034	8,612	12,135
20	25,295	0	5,598	791	6,389	6,389	1,376	13,760	11,593	17,983
25	28,454	0	7,388	1,150	8,539	8,539	1,577	15,771	13,044	21,582
30	32,007	0	9,050	1,572	10,622	10,622	1,767	17,668	14,329	24,951
35	35,571	0	10,509	2,021	12,529	12,529	1,944	19,440	15,475	28,004
40	34,568	0	10,200	1,994	12,194	12,194	1,909	19,095	15,191	27,385
45	33,597	0	9,808	1,944	11,752	11,752	1,864	18,642	14,833	26,586
50	33,810	0	9,851	1,991	11,842	11,842	1,874	18,739	14,874	26,716
55	33,713	0	9,817	2,015	11,832	11,832	1,872	18,719	14,832	26,664
60	31,675	0	9,011	1,837	10,848	10,848	1,777	17,773	14,158	25,006
65	31,857	0	9,022	1,861	10,883	10,883	1,779	17,793	14,153	25,036
70	34,156	0	9,981	2,121	12,102	12,102	1,900	19,004	14,982	27,084
75	33,688	0	9,824	2,087	11,911	11,911	1,881	18,808	14,841	26,752
80	34,543	0	10,171	2,191	12,361	12,361	1,919	19,195	15,085	27,446
85	34,781	0	10,268	2,264	12,531	12,531	1,940	19,402	15,198	27,729
90	37,414	0	11,255	2,547	13,802	13,802	2,065	20,647	16,036	29,837
95	35,801	0	10,719	2,400	13,119	13,119	1,995	19,951	15,555	28,675
100	34,427	0	10,148	2,235	12,383	12,383	1,922	19,215	15,058	27,442

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Total wild spring/summer chinook stocks
Action: A4
Date: October 8, 1999

Total Wild Stocks										
	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Ocean			Harvest			Pre-spawning	LWG		
Year	Escapement	Ocean	Mainstem	Tributary	Inriver	Total	Mortality	Escapement	Spawners	Total Adults
0	11,730	0	748	294	1,042	1,042	553	5,528	4,681	5,723
5	15,749	0	1,204	470	1,675	1,675	888	8,876	7,518	9,193
10	23,513	0	2,952	526	3,478	3,478	1,254	12,535	10,756	14,234
15	30,522	0	5,019	676	5,695	5,695	1,622	16,221	13,923	19,618
20	40,894	0	9,050	1,279	10,330	10,330	2,225	22,246	18,742	29,072
25	46,001	0	11,945	1,859	13,804	13,804	2,550	25,496	21,088	34,892
30	51,745	0	14,631	2,541	17,172	17,172	2,856	28,563	23,166	40,338
35	57,506	0	16,989	3,267	20,256	20,256	3,143	31,428	25,018	45,274
40	55,884	0	16,489	3,224	19,713	19,713	3,087	30,870	24,559	44,272
45	54,316	0	15,856	3,143	19,000	19,000	3,014	30,138	23,981	42,981
50	54,659	0	15,926	3,219	19,145	19,145	3,030	30,295	24,047	43,192
55	54,503	0	15,870	3,258	19,128	19,128	3,026	30,263	23,979	43,106
60	51,208	0	14,567	2,970	17,538	17,538	2,873	28,733	22,889	40,427
65	51,502	0	14,586	3,008	17,594	17,594	2,877	28,765	22,881	40,475
70	55,220	0	16,135	3,429	19,564	19,564	3,072	30,723	24,221	43,786
75	54,463	0	15,882	3,373	19,256	19,256	3,041	30,407	23,993	43,249
80	55,844	0	16,443	3,542	19,984	19,984	3,103	31,032	24,387	44,371
85	56,230	0	16,600	3,660	20,259	20,259	3,137	31,366	24,570	44,829
90	60,486	0	18,195	4,117	22,313	22,313	3,338	33,380	25,924	48,237
95	57,879	0	17,329	3,881	21,210	21,210	3,225	32,254	25,148	46,358
100	55,657	0	16,406	3,613	20,020	20,020	3,106	31,064	24,345	44,364

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
 Statement: Hatchery spring/summer chinook
 Action: A4
 Date: October 8, 1999

Year	Hatchery Stocks												
	(35) SAR Change	(36) Production	(37) Adult Survival Rate	(38) Total Adults	(39) Ocean Escapement	(40) Ocean	(41) Inriver	(42) Harvest			(43) Tributary	(44) Total	(45) Requirements
0	--	2,202,224	0.25%	5,506	7,613	0	914	656	258	914	1,888	2,704	
5	-62.1%	2,202,224	0.09%	2,087	3,260	0	347	249	97	347	1,888	-148	
10	305.4%	2,202,224	0.38%	8,459	12,842	0	1,900	1,612	287	1,900	1,888	4,672	
15	104.0%	2,202,224	0.78%	17,253	24,793	0	4,626	4,077	549	4,626	1,888	10,740	
20	58.4%	2,202,224	1.24%	27,331	35,713	0	9,021	7,904	1,117	9,021	1,888	16,423	
25	20.7%	2,202,224	1.50%	32,982	40,523	0	12,160	10,522	1,638	12,160	1,888	18,935	
30	14.3%	2,202,224	1.71%	37,694	45,157	0	14,986	12,768	2,218	14,986	1,888	20,821	
35	10.8%	2,202,224	1.90%	41,781	49,625	0	17,480	14,661	2,819	17,480	1,888	22,414	
40	-3.3%	2,202,224	1.84%	40,413	47,688	0	16,822	14,071	2,751	16,822	1,888	21,704	
45	-2.6%	2,202,224	1.79%	39,361	46,482	0	16,259	13,569	2,690	16,259	1,888	21,214	
50	0.8%	2,202,224	1.80%	39,695	46,941	0	16,441	13,677	2,764	16,441	1,888	21,366	
55	-0.2%	2,202,224	1.80%	39,603	46,788	0	16,420	13,624	2,796	16,420	1,888	21,295	
60	-6.1%	2,202,224	1.69%	37,186	43,978	0	15,062	12,511	2,551	15,062	1,888	20,237	
65	0.8%	2,202,224	1.70%	37,470	44,515	0	15,207	12,607	2,600	15,207	1,888	20,375	
70	8.1%	2,202,224	1.84%	40,503	47,730	0	16,911	13,947	2,964	16,911	1,888	21,704	
75	-2.0%	2,202,224	1.80%	39,695	46,704	0	16,513	13,620	2,893	16,513	1,888	21,295	
80	2.7%	2,202,224	1.85%	40,768	47,955	0	17,161	14,120	3,041	17,161	1,888	21,719	
85	0.8%	2,202,224	1.87%	41,091	48,171	0	17,356	14,220	3,135	17,356	1,888	21,848	
90	7.4%	2,202,224	2.00%	44,133	51,758	0	19,093	15,570	3,523	19,093	1,888	23,153	
95	-4.7%	2,202,224	1.91%	42,069	49,107	0	17,995	14,703	3,293	17,995	1,888	22,186	
100	-3.8%	2,202,224	1.84%	40,475	47,455	0	17,069	13,989	3,081	17,069	1,888	21,518	

Fall Chinook

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement: Definitions and Equations
Species: Fall Chinook
Date: September 2, 1999

Equation	Variable	Definition
[]	Point Estimates	Ocean and in-river harvest, ocean and in-river harvest rates, and spawners point estimates are the average between upper median and lower median PATH results base case
[1]	Wild ocean escapement <ul style="list-style-type: none"> Year 0 Future years 	1986-1995 average Columbia River run size from "1996 All Species Review: Columbia River Fish Management Plan," August 4, 1997 (TAC 1997); Tab 3 Table 9 PATH results: in-river harvest ÷ in-river harvest rate
[2]	Wild ocean harvest <ul style="list-style-type: none"> Year 0 Future years 	Proportion of A2, Year 5 ocean harvest to ocean escapement PATH results
[3]	Wild mainstem harvest <ul style="list-style-type: none"> Year 0 Future years 	1986-1995 average Columbia River mainstem harvest; Tab 3 Table 9 TAC (1997) PATH results
[4]	Wild tributary harvest	PATH results
[5]	Wild in-river harvest	[3] + [4]
[6]	Wild total harvest	[5] + [2]
[7]	Wild supplements	Adults added to spawners to increase wild production
[8]	Wild LWG escapement	[4] + [9] + [7]
[9]	Wild spawners <ul style="list-style-type: none"> Year 0 Future years 	1986-1995 average LWG escapement. Tab 3 Table 9 TAC (1997); i.e. pre-spawning mortality rate is assumed zero PATH results
[10]	Wild total adults	[9] + [6] + [7], i.e., pre-spawning mortality is assumed to be zero
[11]	Wild egg production <ul style="list-style-type: none"> Year 0 Future years 	[9] ÷ 2 * 3,500 ([9] + [7]) ÷ 2 * 3,500
[12]	Wild smolt production	Based on fecundity function dependent on spawners
[13]	Wild SAR	[10] ÷ [12] _(lagged 5 years)
[14]	Wild SAR change <ul style="list-style-type: none"> Year 5 Future years 	Change in wild smolt production over previous 5 years Change in wild SAR over previous 5 years

[15]	SAR change applied to hatchery stocks	[14]
[16]	Hatchery production	Smolt releases from personal communication with Steve Smith, NMFS (1998). Lyons Ferry production adjusted for hatchery capacity improvements made in 1999. Future years same as Year 0
[17]	Hatchery SAR <ul style="list-style-type: none"> • Year 0 • Future years 	1986-1995 average; SAR from CWT Missing Production Groups Annual Reports (NMFS, IDFW) Same rate change as wild total adults to PATH wild spawners and supplements lagged 5 years
[18]	Hatchery total adults	[16] * [17]
[19]	Hatchery ocean escapement	[18] * ([1] ÷ [10])
[20]	Hatchery ocean harvest	[18] * ([2] ÷ [10])
[21]	Hatchery in-river harvest	[18] * ([5] ÷ [10])
[22]	Hatchery mainstem harvest	[18] * ([3] ÷ [10])
[23]	Hatchery tributary harvest	[18] * ([4] ÷ [10])
[24]	Hatchery total harvest	[20] + [21]
[25]	Hatchery requirements	[16] ÷ 3,500 * 3; i.e. it takes 3 adults to generate a typical hatch with fecundity of 3500 eggs
[26]	Hatchery surplus	[18] - [24] - [25]

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement: Wild fall chinook using PATH results
Data: PATH Results November 9, 1998
Filter: "base case"
Action: A2
Date: October 8, 1999

PATH Index Stocks														
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Ocean			Harvest				LWG			Production		5 year Adult Survival	
Year	Escapement	Ocean	Mainstem	Tributaries	Inriver	Total	Supplements	Escapement	Spawners	Total Adults	Eggs	Smolts	Rates	Rate Change
0	1,951	599	748	0	748	1,347	0	414	414	1,761	725,278	170,128		
5	3,590	1,101	917	0	917	2,019	500	1,695	1,195	3,714	2,966,465	107,354	2.2%	-36.9%
10	5,493	1,335	1,414	0	1,414	2,749	500	2,192	1,692	4,940	3,835,617	97,947	4.6%	110.8%
15	6,432	1,495	1,650	0	1,650	3,145	500	2,528	2,028	5,673	4,424,454	95,399	5.8%	25.9%
20	6,975	1,571	1,796	0	1,796	3,367	500	2,625	2,125	5,992	4,593,163	94,938	6.3%	8.4%
25	7,227	1,590	1,861	0	1,861	3,451	500	2,691	2,191	6,143	4,710,028	94,670	6.5%	3.0%
30	7,174	1,538	1,847	0	1,847	3,385	500	2,702	2,202	6,088	4,729,140	94,629	6.4%	-0.6%
35	7,196	1,587	1,846	0	1,846	3,433	500	2,684	2,184	6,117	4,696,978	94,698	6.5%	0.5%
40	7,309	1,575	1,882	0	1,882	3,457	0	2,204	2,204	5,662	3,857,528	77,128	6.0%	-7.5%
45	7,114	1,556	1,832	0	1,832	3,387	0	2,169	2,169	5,556	3,795,103	77,003	7.2%	20.5%
50	7,054	1,573	1,810	0	1,810	3,383	0	2,158	2,158	5,540	3,775,861	76,965	7.2%	-0.1%
55	7,289	1,536	1,877	0	1,877	3,414	0	2,203	2,203	5,617	3,855,071	77,123	7.3%	1.4%
60	7,037	1,531	1,812	0	1,812	3,343	0	2,181	2,181	5,525	3,817,564	77,048	7.2%	-1.8%
65	7,197	1,571	1,853	0	1,853	3,424	0	2,210	2,210	5,634	3,866,683	77,146	7.3%	2.1%
70	7,303	1,581	1,881	0	1,881	3,462	0	2,210	2,210	5,672	3,867,703	77,148	7.4%	0.5%
75	7,101	1,542	1,828	0	1,828	3,370	0	2,182	2,182	5,553	3,818,648	77,050	7.2%	-2.1%
80	7,254	1,591	1,861	0	1,861	3,453	0	2,240	2,240	5,693	3,920,828	77,255	7.4%	2.7%
85	7,238	1,540	1,857	0	1,857	3,397	0	2,191	2,191	5,588	3,833,513	77,080	7.2%	-2.1%
90	7,214	1,490	1,857	0	1,857	3,347	0	2,195	2,195	5,542	3,841,452	77,095	7.2%	-0.6%
95	7,288	1,541	1,876	0	1,876	3,417	0	2,178	2,178	5,595	3,811,129	77,035	7.3%	0.9%
100	7,269	1,607	1,865	0	1,865	3,473	0	2,223	2,223	5,696	3,889,821	77,193	7.4%	1.9%

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project

Statement: Hatchery fall chinook

Data: PATH November 9, 1998

Filter: PATH index stock changes

Action: A2

Date: October 8, 1999

Hatchery Stocks														
	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)		
	SAR	Production	Survival Rate	Adult	Total Adults	Ocean	Escapement	Ocean	Inriver	Mainstem	Tributary	Total	Requirements	Surplus
Year	Change													
0	--	900,000	0.60%	5,400	5,982	1,835	2,294	2,294	0	4,129	771	499		
5	-36.9%	900,000	0.38%	3,407	3,294	1,011	842	842	0	1,852	771	784		
10	110.8%	900,000	0.80%	7,184	7,987	1,941	2,055	2,055	0	3,997	771	2,416		
15	25.9%	900,000	1.00%	9,041	10,250	2,383	2,629	2,629	0	5,012	771	3,258		
20	8.4%	900,000	1.09%	9,804	11,413	2,570	2,939	2,939	0	5,509	771	3,523		
25	3.0%	900,000	1.12%	10,100	11,883	2,614	3,060	3,060	0	5,674	771	3,654		
30	-0.6%	900,000	1.12%	10,038	11,830	2,536	3,046	3,046	0	5,582	771	3,684		
35	0.5%	900,000	1.12%	10,091	11,870	2,617	3,046	3,046	0	5,663	771	3,656		
40	-7.5%	900,000	1.04%	9,333	12,049	2,596	3,103	3,103	0	5,699	771	2,862		
45	20.5%	900,000	1.25%	11,245	14,399	3,148	3,707	3,707	0	6,855	771	3,618		
50	-0.1%	900,000	1.25%	11,231	14,300	3,189	3,669	3,669	0	6,857	771	3,603		
55	1.4%	900,000	1.27%	11,392	14,783	3,116	3,808	3,808	0	6,924	771	3,696		
60	-1.8%	900,000	1.24%	11,182	14,242	3,099	3,668	3,668	0	6,767	771	3,644		
65	2.1%	900,000	1.27%	11,414	14,581	3,182	3,755	3,755	0	6,938	771	3,705		
70	0.5%	900,000	1.28%	11,476	14,777	3,199	3,806	3,806	0	7,004	771	3,701		
75	-2.1%	900,000	1.25%	11,235	14,367	3,121	3,699	3,699	0	6,820	771	3,644		
80	2.7%	900,000	1.28%	11,534	14,696	3,224	3,771	3,771	0	6,995	771	3,768		
85	-2.1%	900,000	1.25%	11,290	14,624	3,112	3,752	3,752	0	6,864	771	3,655		
90	-0.6%	900,000	1.25%	11,224	14,610	3,017	3,762	3,762	0	6,779	771	3,674		
95	0.9%	900,000	1.26%	11,328	14,757	3,119	3,799	3,799	0	6,919	771	3,638		
100	1.9%	900,000	1.28%	11,541	14,730	3,257	3,780	3,780	0	7,037	771	3,733		

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project

Statement: Wild fall chinook using PATH results

Data: PATH Results November 9, 1998

Filter: "base case"

Action: A3

Date: October 8, 1999

PATH Index Stocks														
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Ocean			Harvest				LWG			Production		5 year	Adult Survival
Year	Escapement	Ocean	Mainstem	Tributaries	Inriver	Total	Supplements	Escapement	Spawners	Total Adults	Eggs	Smolts	Rates	Rate Change
0	1,951	599	748	0	748	1,347	0	414	414	1,761	725,278	170,128		
5	3,540	1,105	907	0	907	2,013	500	1,681	1,181	3,694	2,942,141	107,811	2.2%	-36.6%
10	5,612	1,574	1,445	0	1,445	3,018	500	2,243	1,743	5,261	3,924,792	97,440	4.9%	124.8%
15	7,506	1,804	1,926	0	1,926	3,730	500	2,774	2,274	6,504	4,854,187	94,388	6.7%	36.8%
20	8,175	1,851	2,106	0	2,106	3,957	500	2,873	2,373	6,830	5,028,365	94,111	7.2%	8.4%
25	8,387	1,892	2,160	0	2,160	4,052	500	2,944	2,444	6,996	5,151,432	93,952	7.4%	2.7%
30	8,574	1,816	2,209	0	2,209	4,025	500	2,992	2,492	7,017	5,235,660	93,859	7.5%	0.5%
35	8,576	1,897	2,209	0	2,209	4,106	500	2,980	2,480	7,086	5,215,690	93,880	7.5%	1.1%
40	8,612	1,899	2,218	0	2,218	4,117	0	2,505	2,505	6,622	4,383,899	78,222	7.1%	-6.6%
45	8,600	1,886	2,215	0	2,215	4,101	0	2,479	2,479	6,581	4,338,927	78,127	8.4%	19.3%
50	8,452	1,902	2,177	0	2,177	4,079	0	2,472	2,472	6,551	4,326,589	78,100	8.4%	-0.3%
55	8,526	1,867	2,196	0	2,196	4,063	0	2,446	2,446	6,509	4,280,328	78,002	8.3%	-0.6%
60	8,595	1,869	2,214	0	2,214	4,083	0	2,447	2,447	6,530	4,282,886	78,008	8.4%	0.5%
65	8,502	1,890	2,190	0	2,190	4,080	0	2,437	2,437	6,517	4,264,671	77,969	8.4%	-0.2%
70	8,512	1,964	2,193	0	2,193	4,156	0	2,497	2,497	6,653	4,370,090	78,193	8.5%	2.1%
75	8,631	1,863	2,223	0	2,223	4,086	0	2,510	2,510	6,596	4,393,267	78,242	8.4%	-1.1%
80	8,583	1,869	2,211	0	2,211	4,079	0	2,507	2,507	6,587	4,387,961	78,231	8.4%	-0.2%
85	8,547	1,892	2,202	0	2,202	4,094	0	2,469	2,469	6,563	4,320,604	78,088	8.4%	-0.4%
90	8,782	1,922	2,262	0	2,262	4,184	0	2,517	2,517	6,702	4,405,244	78,268	8.6%	2.3%
95	8,318	1,907	2,142	0	2,142	4,050	0	2,409	2,409	6,459	4,215,901	77,866	8.3%	-3.8%
100	8,641	1,879	2,226	0	2,226	4,105	0	2,464	2,464	6,568	4,311,126	78,068	8.4%	2.2%

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project

Statement: Hatchery fall chinook

Data: PATH November 9, 1998

Filter: PATH index stock changes

Action: A3

Date: October 8, 1999

Hatchery Stocks														
	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)		
	SAR	Production	Survival Rate	Adult	Total Adults	Ocean	Escapement	Ocean	Inriver	Mainstem	Tributary	Total	Requirements	Surplus
Year	Change													
0	--	900,000	0.60%	5,400	5,982	1,835	2,294	2,294	0	4,129	771	499		
5	-36.6%	900,000	0.38%	3,422	3,280	1,024	841	841	0	1,864	771	786		
10	124.8%	900,000	0.85%	7,691	8,205	2,301	2,112	2,112	0	4,413	771	2,507		
15	36.8%	900,000	1.17%	10,520	12,142	2,917	3,116	3,116	0	6,033	771	3,715		
20	8.4%	900,000	1.27%	11,405	13,651	3,091	3,516	3,516	0	6,607	771	4,027		
25	2.7%	900,000	1.30%	11,717	14,046	3,169	3,618	3,618	0	6,787	771	4,158		
30	0.5%	900,000	1.31%	11,771	14,383	3,047	3,705	3,705	0	6,752	771	4,248		
35	1.1%	900,000	1.32%	11,899	14,401	3,185	3,710	3,710	0	6,895	771	4,233		
40	-6.6%	900,000	1.24%	11,118	14,459	3,188	3,725	3,725	0	6,912	771	3,434		
45	19.3%	900,000	1.47%	13,259	17,329	3,800	4,464	4,464	0	8,264	771	4,224		
50	-0.3%	900,000	1.47%	13,216	17,051	3,836	4,392	4,392	0	8,228	771	4,216		
55	-0.6%	900,000	1.46%	13,136	17,207	3,767	4,433	4,433	0	8,200	771	4,165		
60	0.5%	900,000	1.47%	13,195	17,368	3,777	4,474	4,474	0	8,250	771	4,174		
65	-0.2%	900,000	1.46%	13,167	17,177	3,819	4,425	4,425	0	8,244	771	4,152		
70	2.1%	900,000	1.49%	13,450	17,207	3,970	4,432	4,432	0	8,402	771	4,277		
75	-1.1%	900,000	1.48%	13,296	17,398	3,754	4,482	4,482	0	8,236	771	4,289		
80	-0.2%	900,000	1.47%	13,269	17,290	3,764	4,454	4,454	0	8,218	771	4,280		
85	-0.4%	900,000	1.47%	13,222	17,221	3,812	4,436	4,436	0	8,248	771	4,203		
90	2.3%	900,000	1.50%	13,527	17,726	3,879	4,566	4,566	0	8,446	771	4,309		
95	-3.8%	900,000	1.45%	13,006	16,750	3,841	4,314	4,314	0	8,155	771	4,080		
100	2.2%	900,000	1.48%	13,295	17,492	3,803	4,506	4,506	0	8,309	771	4,215		

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement: Wild fall chinook using PATH results
Data: PATH Results November 9, 1998
Filter: "base case"
Action: A4
Date: October 8, 1999

PATH Index Stocks														
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Ocean			Harvest				LWG			Production		5 year Adult Survival	
Year	Escapement	Ocean	Mainstem	Tributaries	Inriver	Total	Supplements	Escapement	Spawners	Total Adults	Eggs	Smolts	Rates	Rate Change
0	1,951	599	748	0	748	1,347	0	414	414	1,761	725,278	170,128		
5	2,224	427	567	0	567	994	500	1,105	605	2,099	1,934,034	170,959	1.2%	0.5%
10	8,040	3,090	2,071	0	2,071	5,161	500	4,007	3,507	9,168	7,012,562	93,683	5.4%	334.6%
15	26,730	6,357	6,892	0	6,892	13,248	500	11,566	11,066	24,815	20,241,125	106,920	26.5%	393.9%
20	39,260	6,767	10,163	0	10,163	16,929	500	14,927	14,427	31,856	26,121,859	112,153	29.8%	12.5%
25	42,045	7,138	10,879	0	10,879	18,017	500	15,599	15,099	33,615	27,297,412	113,121	30.0%	0.6%
30	43,298	7,170	11,202	0	11,202	18,372	500	16,152	15,652	34,524	28,266,416	113,901	30.5%	1.8%
35	43,298	7,258	11,202	0	11,202	18,460	500	16,157	15,657	34,616	28,274,586	113,908	30.4%	-0.4%
40	44,334	7,176	11,483	0	11,483	18,659	0	15,498	15,498	34,157	27,121,662	110,133	30.0%	-1.3%
45	43,719	7,178	11,310	0	11,310	18,489	0	15,371	15,371	33,859	26,898,977	109,931	30.7%	2.5%
50	43,451	7,272	11,241	0	11,241	18,513	0	15,401	15,401	33,914	26,951,509	109,979	30.9%	0.3%
55	44,188	7,338	11,432	0	11,432	18,770	0	15,331	15,331	34,101	26,829,229	109,867	31.0%	0.5%
60	43,846	7,214	11,356	0	11,356	18,570	0	15,678	15,678	34,248	27,437,003	110,416	31.2%	0.5%
65	42,684	7,095	11,042	0	11,042	18,138	0	15,787	15,787	33,924	27,626,471	110,586	30.7%	-1.4%
70	43,059	7,392	11,140	0	11,140	18,532	0	15,661	15,661	34,193	27,407,552	110,390	30.9%	0.6%
75	44,284	7,247	11,457	0	11,457	18,704	0	15,605	15,605	34,309	27,308,869	110,301	31.1%	0.5%
80	43,901	7,187	11,370	0	11,370	18,557	0	15,596	15,596	34,153	27,293,101	110,287	31.0%	-0.4%
85	44,253	7,167	11,449	0	11,449	18,617	0	15,907	15,907	34,524	27,837,845	110,774	31.3%	1.1%
90	43,991	7,014	11,381	0	11,381	18,395	0	15,201	15,201	33,596	26,601,684	109,660	30.3%	-3.1%
95	43,339	7,178	11,212	0	11,212	18,390	0	15,509	15,509	33,899	27,140,994	110,150	30.9%	1.9%
100	43,967	7,133	11,388	0	11,388	18,520	0	15,507	15,507	34,028	27,137,651	110,147	30.9%	-0.1%

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project

Statement: Hatchery fall chinook

Data: PATH November 9, 1998

Filter: PATH index stock changes

Action: A4

Date: October 8, 1999

Hatchery Stocks														
	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)		
Year	SAR	Production	Survival Rate	Adult	Total Adults	Ocean	Escapement	Ocean	Inriver	Mainstem	Tributary	Total	Requirements	Surplus
0	--	900,000	0.60%	5,400	5,982	1,835	2,294	2,294	0	4,129	771	499		
5	0.5%	900,000	0.60%	5,426	5,750	1,103	1,466	1,466	0	2,569	771	2,085		
10	334.6%	900,000	2.62%	23,584	20,683	7,948	5,328	5,328	0	13,276	771	9,537		
15	393.9%	900,000	12.94%	116,492	125,485	29,841	32,353	32,353	0	62,194	771	53,526		
20	12.5%	900,000	14.56%	131,034	161,488	27,834	41,802	41,802	0	69,636	771	60,627		
25	0.6%	900,000	14.65%	131,817	164,874	27,991	42,659	42,659	0	70,650	771	60,396		
30	1.8%	900,000	14.91%	134,222	168,333	27,875	43,551	43,551	0	71,426	771	62,025		
35	-0.4%	900,000	14.85%	133,660	167,182	28,024	43,251	43,251	0	71,276	771	61,613		
40	-1.3%	900,000	14.65%	131,878	171,172	27,707	44,334	44,334	0	72,041	771	59,066		
45	2.5%	900,000	15.02%	135,211	174,584	28,665	45,165	45,165	0	73,830	771	60,609		
50	0.3%	900,000	15.08%	135,677	173,832	29,091	44,973	44,973	0	74,064	771	60,842		
55	0.5%	900,000	15.15%	136,366	176,702	29,343	45,716	45,716	0	75,059	771	60,535		
60	0.5%	900,000	15.23%	137,094	175,512	28,877	45,458	45,458	0	74,335	771	61,988		
65	-1.4%	900,000	15.01%	135,121	170,012	28,260	43,983	43,983	0	72,243	771	62,107		
70	0.6%	900,000	15.11%	135,985	171,244	29,396	44,304	44,304	0	73,700	771	61,513		
75	0.5%	900,000	15.19%	136,687	176,426	28,872	45,644	45,644	0	74,517	771	61,399		
80	-0.4%	900,000	15.13%	136,174	175,042	28,654	45,336	45,336	0	73,990	771	61,413		
85	1.1%	900,000	15.30%	137,671	176,469	28,581	45,656	45,656	0	74,237	771	62,662		
90	-3.1%	900,000	14.82%	133,382	174,653	27,846	45,184	45,184	0	73,031	771	59,579		
95	1.9%	900,000	15.11%	135,953	173,810	28,787	44,967	44,967	0	73,753	771	61,428		
100	-0.1%	900,000	15.10%	135,860	175,547	28,479	45,467	45,467	0	73,945	771	61,144		

Summer Steelhead

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement: Definitions and Equations
Species: Summer Steelhead
Date: September 2, 1999

Equation	Variable	Definition
[1]	Wild ocean escapement <ul style="list-style-type: none"> Year 0 Future years 	LWG escapement with no mainstem harvest from Tab 8, Tables 12 and 13, 1986-1995 (length method) A and B runs. TAC (1997) Share (37%) of change calculated from spring/summer chinook PATH wild ocean escapement
[2]	Wild ocean harvest	Assumed to be zero
[3-4]	Wild main stem harvest <ul style="list-style-type: none"> Non-treaty Treaty 	Share of wild ocean escapement. Tab 8, Tables 12 and 13, TAC (1997)
[5]	Wild total mainstem harvest	[3] + [4]
[6]	Wild tributary harvest	Share of wild ocean escapement. Tab 8, Tables 12 and 13, TAC (1997)
[7]	Wild in-river harvest	[5] + [6]
[8]	Wild total harvest	[2] + [7].
[9]	Wild pre-spawning mortality	[8] * 10%
[10]	Wild LWG escapement	Share of wild ocean escapement. Tab 8, Tables 12 and 13, TAC (1997)
[11]	Wild spawners	[10] - [6] - [9].
[12]	Wild total adults	[8] + [9] + [11]
[13]	Hatchery production	Smolt releases from personal communications with Steve Smith, NMFS (1998). Future years are the same as Year 0
[14]	Hatchery SAR <ul style="list-style-type: none"> Year 0 Future years 	1986-1995 average; SAR from CWT Missing Production Groups Annual Reports (NMFS, IDFW) Share (37%) of calculated spring/summer chinook hatchery SAR change
[15]	Hatchery total adults	[13] * [14]
[16]	Hatchery ocean escapement <ul style="list-style-type: none"> Year 0 Future years 	LWG escapement with no mainstem harvest from Tab 8, Tables 12 and 13, 1986-1995 (length method) A and B runs. TAC (1997) Same percentage change as hatchery total adults
[17]	Hatchery ocean harvest	Assumed to be zero
[18-19]	Hatchery mainstem <ul style="list-style-type: none"> Non-treaty harvest Treaty harvest 	Share of hatchery ocean escapement based on 1986-1995 average from TAC (1997)

[20]	Hatchery total mainstem harvest	[18] + [19]
[21]	Hatchery tributary harvest	Share of hatchery ocean escapement based on 1986-1995 average from TAC (1997)
[22]	Hatchery in-river harvest	[20] + [21]
[23]	Hatchery total harvest	[17] + [22]
[24]	Hatchery requirements	[13] ÷ 2500 * 3; i.e. it takes 3 adults to generate a typical hatch with a fecundity of 2,500 eggs
[25]	Hatchery surplus	[15] - [23] - [24]

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement: Summer steelhead using changes in PATH spring/summer chinook index stocks
Filter: Spring/summer chinook "equal weights"
Action: A1
Date: October 8, 1999

Wild Stocks												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Harvest					Pre-Spawning			LWG			
Year	Ocean	Mainstem			Tributary			Mortality	Escapement	Spawners	Total Adults	
	Escapement	Ocean	Non-treaty	Treaty	Total	Inriver	Total					
0	21,187	0	0	4,110	4,110	0	4,110	4,110	1,708	17,077	15,369	21,187
5	23,943	0	0	4,645	4,645	0	4,645	4,645	1,930	19,298	17,369	23,943
10	28,169	0	0	5,465	5,465	0	5,465	5,465	2,270	22,704	20,434	28,169
15	30,654	0	0	5,947	5,947	0	5,947	5,947	2,471	24,707	22,236	30,654
20	33,070	0	0	6,416	6,416	0	6,416	6,416	2,665	26,654	23,989	33,070
25	32,731	0	3,273	11,456	14,729	8,183	22,912	22,912	1,800	18,002	8,019	32,731
30	33,329	0	3,333	11,665	14,998	8,332	23,330	23,330	1,833	18,331	8,166	33,329
35	34,439	0	3,444	12,054	15,498	8,610	24,108	24,108	1,894	18,942	8,438	34,439
40	34,110	0	3,411	11,939	15,350	8,528	23,877	23,877	1,876	18,761	8,357	34,110
45	33,536	0	3,354	11,737	15,091	8,384	23,475	23,475	1,844	18,445	8,216	33,536
50	32,720	0	3,272	11,452	14,724	8,180	22,904	22,904	1,800	17,996	8,016	32,720
55	32,702	0	3,270	11,446	14,716	8,176	22,891	22,891	1,799	17,986	8,012	32,702
60	31,851	0	3,185	11,148	14,333	7,963	22,295	22,295	1,752	17,518	7,803	31,851
65	31,646	0	3,165	11,076	14,241	7,911	22,152	22,152	1,741	17,405	7,753	31,646
70	32,629	0	3,263	11,420	14,683	8,157	22,841	22,841	1,795	17,946	7,994	32,629
75	32,562	0	3,256	11,397	14,653	8,141	22,794	22,794	1,791	17,909	7,978	32,562
80	33,531	0	3,353	11,736	15,089	8,383	23,472	23,472	1,844	18,442	8,215	33,531
85	33,627	0	3,363	11,769	15,132	8,407	23,539	23,539	1,849	18,495	8,239	33,627
90	34,788	0	3,479	12,176	15,655	8,697	24,352	24,352	1,913	19,134	8,523	34,788
95	34,459	0	3,446	12,061	15,507	8,615	24,122	24,122	1,895	18,953	8,443	34,459
100	33,788	0	3,379	11,826	15,205	8,447	23,652	23,652	1,858	18,583	8,278	33,788

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement Hatchery summer steelhead
Action: A1
Date: October 8, 1999

Hatchery Stocks													
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
	Adult		Ocean		Mainstem			Harvest			Requirements	Surplus	
Year	Production	Survival Rate	Total Adults	Escapement	Ocean	Non-treaty	Treaty	Total	Tributary	Inriver	Total	Requirements	Surplus
0	11,352,700	0.80%	90,822	105,598	0	10,560	25,977	36,537	40,233	76,770	76,770	13,623	429
5	11,352,700	0.59%	67,111	78,030	0	8,317	19,117	27,435	27,685	55,120	55,120	13,623	-1,631
10	11,352,700	0.70%	79,500	92,434	0	10,561	24,569	35,130	30,374	65,504	65,504	13,623	373
15	11,352,700	1.55%	175,861	204,473	0	17,444	58,602	76,046	61,833	137,878	137,878	13,623	24,359
20	11,352,700	1.75%	198,938	231,304	0	21,998	71,103	93,101	63,886	156,988	156,988	13,623	28,327
25	11,352,700	1.77%	201,301	234,052	0	23,405	81,918	105,323	58,513	163,837	163,837	13,623	23,841
30	11,352,700	1.79%	203,310	236,388	0	23,639	82,736	106,375	59,097	165,472	165,472	13,623	24,215
35	11,352,700	1.87%	212,440	247,004	0	24,700	86,451	111,152	61,751	172,903	172,903	13,623	25,914
40	11,352,700	1.87%	212,553	247,135	0	24,713	86,497	111,211	61,784	172,994	172,994	13,623	25,935
45	11,352,700	1.83%	207,934	241,765	0	24,176	84,618	108,794	60,441	169,235	169,235	13,623	25,076
50	11,352,700	1.80%	204,260	237,492	0	23,749	83,122	106,871	59,373	166,244	166,244	13,623	24,392
55	11,352,700	1.80%	204,115	237,324	0	23,732	83,063	106,796	59,331	166,127	166,127	13,623	24,365
60	11,352,700	1.74%	197,648	229,804	0	22,980	80,431	103,412	57,451	160,863	160,863	13,623	23,161
65	11,352,700	1.71%	194,286	225,896	0	22,590	79,064	101,653	56,474	158,127	158,127	13,623	22,536
70	11,352,700	1.77%	200,654	233,300	0	23,330	81,655	104,985	58,325	163,310	163,310	13,623	23,721
75	11,352,700	1.79%	203,383	236,473	0	23,647	82,766	106,413	59,118	165,531	165,531	13,623	24,229
80	11,352,700	1.82%	206,831	240,482	0	24,048	84,169	108,217	60,120	168,337	168,337	13,623	24,870
85	11,352,700	1.83%	208,081	241,936	0	24,194	84,677	108,871	60,484	169,355	169,355	13,623	25,103
90	11,352,700	1.91%	216,479	251,699	0	25,170	88,095	113,265	62,925	176,189	176,189	13,623	26,666
95	11,352,700	1.90%	215,914	251,042	0	25,104	87,865	112,969	62,760	175,729	175,729	13,623	26,561
100	11,352,700	1.86%	211,029	245,362	0	24,536	85,877	110,413	61,341	171,754	171,754	13,623	25,652

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement: Summer steelhead using changes in PATH spring/summer chinook index stocks
Filter: Spring/summer chinook "equal weights"
Action: A2
Date: October 8, 1999

Wild Stocks												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Harvest					Pre-Spawning			LWG			
Year	Ocean Escapement	Ocean	Non-treaty	Treaty	Total	Tributary	Inriver	Total	Mortality	Escapement	Spawners	Total Adults
0	21,187	0	0	4,110	4,110	0	4,110	4,110	1,708	17,077	15,369	21,187
5	24,094	0	0	4,674	4,674	0	4,674	4,674	1,942	19,420	17,478	24,094
10	28,132	0	0	5,458	5,458	0	5,458	5,458	2,267	22,674	20,407	28,132
15	30,662	0	0	5,948	5,948	0	5,948	5,948	2,471	24,714	22,242	30,662
20	33,567	0	0	6,512	6,512	0	6,512	6,512	2,705	27,055	24,349	33,567
25	33,226	0	3,323	11,629	14,952	8,306	23,258	23,258	1,827	18,274	8,140	33,226
30	33,736	0	3,374	11,807	15,181	8,434	23,615	23,615	1,855	18,555	8,265	33,736
35	34,420	0	3,442	12,047	15,489	8,605	24,094	24,094	1,893	18,931	8,433	34,420
40	34,017	0	3,402	11,906	15,307	8,504	23,812	23,812	1,871	18,709	8,334	34,017
45	33,641	0	3,364	11,774	15,138	8,410	23,549	23,549	1,850	18,503	8,242	33,641
50	31,930	0	3,193	11,175	14,368	7,982	22,351	22,351	1,756	17,561	7,823	31,930
55	31,927	0	3,193	11,175	14,367	7,982	22,349	22,349	1,756	17,560	7,822	31,927
60	31,447	0	3,145	11,006	14,151	7,862	22,013	22,013	1,730	17,296	7,704	31,447
65	31,526	0	3,153	11,034	14,187	7,881	22,068	22,068	1,734	17,339	7,724	31,526
70	31,885	0	3,188	11,160	14,348	7,971	22,319	22,319	1,754	17,537	7,812	31,885
75	31,932	0	3,193	11,176	14,370	7,983	22,353	22,353	1,756	17,563	7,823	31,932
80	33,761	0	3,376	11,816	15,192	8,440	23,632	23,632	1,857	18,568	8,271	33,761
85	33,898	0	3,390	11,864	15,254	8,474	23,728	23,728	1,864	18,644	8,305	33,898
90	34,657	0	3,466	12,130	15,596	8,664	24,260	24,260	1,906	19,061	8,491	34,657
95	34,327	0	3,433	12,014	15,447	8,582	24,029	24,029	1,888	18,880	8,410	34,327
100	33,941	0	3,394	11,879	15,273	8,485	23,759	23,759	1,867	18,668	8,316	33,941

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement Hatchery summer steelhead
Action: A2
Date: October 8, 1999

Hatchery Stocks													
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
	Adult		Ocean		Harvest								
Year	Production	Survival Rate	Total Adults	Escapement	Ocean	Mainstem			Tributary	Inriver	Total	Requirements	Surplus
						Non-treaty	Treaty	Total					
0	11,352,700	0.80%	90,822	105,598	0	10,560	25,977	36,537	40,233	76,770	76,770	13,623	429
5	11,352,700	0.65%	73,652	85,635	0	9,128	20,981	30,108	30,383	60,492	60,492	13,623	-463
10	11,352,700	1.13%	128,798	149,753	0	17,109	39,804	56,914	49,209	106,122	106,122	13,623	9,052
15	11,352,700	1.63%	185,522	215,706	0	18,402	61,821	80,223	65,229	145,453	145,453	13,623	26,446
20	11,352,700	1.86%	211,187	245,546	0	23,353	75,481	98,834	67,820	166,654	166,654	13,623	30,910
25	11,352,700	1.87%	212,124	246,636	0	24,664	86,323	110,986	61,659	172,645	172,645	13,623	25,856
30	11,352,700	1.88%	213,193	247,879	0	24,788	86,758	111,546	61,970	173,516	173,516	13,623	26,055
35	11,352,700	1.95%	220,940	256,886	0	25,689	89,910	115,599	64,222	179,820	179,820	13,623	27,496
40	11,352,700	1.93%	219,614	255,344	0	25,534	89,370	114,905	63,836	178,741	178,741	13,623	27,250
45	11,352,700	1.90%	215,693	250,785	0	25,079	87,775	112,853	62,696	175,550	175,550	13,623	26,520
50	11,352,700	1.83%	207,417	241,163	0	24,116	84,407	108,523	60,291	168,814	168,814	13,623	24,980
55	11,352,700	1.82%	207,008	240,688	0	24,069	84,241	108,309	60,172	168,481	168,481	13,623	24,903
60	11,352,700	1.77%	201,329	234,085	0	23,408	81,930	105,338	58,521	163,859	163,859	13,623	23,847
65	11,352,700	1.76%	199,242	231,658	0	23,166	81,080	104,246	57,914	162,161	162,161	13,623	23,458
70	11,352,700	1.80%	204,132	237,343	0	23,734	83,070	106,805	59,336	166,140	166,140	13,623	24,368
75	11,352,700	1.82%	206,444	240,032	0	24,003	84,011	108,014	60,008	168,022	168,022	13,623	24,799
80	11,352,700	1.89%	214,122	248,959	0	24,896	87,136	112,032	62,240	174,271	174,271	13,623	26,227
85	11,352,700	1.91%	216,334	251,531	0	25,153	88,036	113,189	62,883	176,072	176,072	13,623	26,639
90	11,352,700	1.97%	223,483	259,843	0	25,984	90,945	116,930	64,961	181,890	181,890	13,623	27,970
95	11,352,700	1.96%	222,494	258,693	0	25,869	90,543	116,412	64,673	181,085	181,085	13,623	27,786
100	11,352,700	1.92%	218,123	253,611	0	25,361	88,764	114,125	63,403	177,528	177,528	13,623	26,972

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement: Summer steelhead using changes in PATH spring/summer chinook index stocks
Filter: Spring/summer chinook "equal weights"
Action: A3
Date: October 8, 1999

Wild Stocks												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Harvest					Pre-Spawning			LWG			
Year	Ocean Escapement	Ocean	Non-treaty	Treaty	Total	Tributary	Inriver	Total	Mortality	Escapement	Spawners	Total Adults
0	21,187	0	0	4,110	4,110	0	4,110	4,110	1,708	17,077	15,369	21,187
5	23,736	0	0	4,605	4,605	0	4,605	4,605	1,913	19,131	17,218	23,736
10	27,851	0	0	5,403	5,403	0	5,403	5,403	2,245	22,448	20,203	27,851
15	30,059	0	0	5,831	5,831	0	5,831	5,831	2,423	24,228	21,805	30,059
20	32,802	0	0	6,364	6,364	0	6,364	6,364	2,644	26,439	23,795	32,802
25	32,488	0	3,249	11,371	14,620	8,122	22,742	22,742	1,787	17,869	7,960	32,488
30	32,787	0	3,279	11,476	14,754	8,197	22,951	22,951	1,803	18,033	8,033	32,787
35	33,727	0	3,373	11,804	15,177	8,432	23,609	23,609	1,855	18,550	8,263	33,727
40	33,344	0	3,334	11,670	15,005	8,336	23,341	23,341	1,834	18,339	8,169	33,344
45	32,849	0	3,285	11,497	14,782	8,212	22,994	22,994	1,807	18,067	8,048	32,849
50	31,443	0	3,144	11,005	14,149	7,861	22,010	22,010	1,729	17,293	7,703	31,443
55	31,514	0	3,151	11,030	14,181	7,878	22,060	22,060	1,733	17,332	7,721	31,514
60	30,619	0	3,062	10,716	13,778	7,655	21,433	21,433	1,684	16,840	7,502	30,619
65	30,593	0	3,059	10,707	13,767	7,648	21,415	21,415	1,683	16,826	7,495	30,593
70	31,366	0	3,137	10,978	14,115	7,842	21,956	21,956	1,725	17,251	7,685	31,366
75	31,491	0	3,149	11,022	14,171	7,873	22,044	22,044	1,732	17,320	7,715	31,491
80	32,806	0	3,281	11,482	14,763	8,201	22,964	22,964	1,804	18,043	8,037	32,806
85	33,023	0	3,302	11,558	14,860	8,256	23,116	23,116	1,816	18,163	8,091	33,023
90	34,018	0	3,402	11,906	15,308	8,505	23,813	23,813	1,871	18,710	8,334	34,018
95	33,582	0	3,358	11,754	15,112	8,395	23,507	23,507	1,847	18,470	8,228	33,582
100	33,084	0	3,308	11,579	14,888	8,271	23,159	23,159	1,820	18,196	8,106	33,084

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement Hatchery summer steelhead
Action: A3
Date: October 8, 1999

Hatchery Stocks													
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
	Adult		Ocean		Harvest								
Year	Production	Survival Rate	Total Adults	Escapement	Ocean	Mainstem			Tributary	Inriver	Total	Requirements	Surplus
						Non-treaty	Treaty	Total					
0	11,352,700	0.80%	90,822	105,598	0	10,560	25,977	36,537	40,233	76,770	76,770	13,623	429
5	11,352,700	0.63%	71,143	82,717	0	8,817	20,266	29,082	29,348	58,431	58,431	13,623	-911
10	11,352,700	1.22%	139,018	161,636	0	18,467	42,963	61,430	53,114	114,544	114,544	13,623	10,851
15	11,352,700	1.65%	186,867	217,270	0	18,536	62,270	80,805	65,702	146,508	146,508	13,623	26,736
20	11,352,700	1.84%	209,001	243,005	0	23,111	74,700	97,811	67,118	164,929	164,929	13,623	30,449
25	11,352,700	1.84%	209,079	243,096	0	24,310	85,084	109,393	60,774	170,167	170,167	13,623	25,289
30	11,352,700	1.85%	210,031	244,203	0	24,420	85,471	109,891	61,051	170,942	170,942	13,623	25,466
35	11,352,700	1.92%	218,313	253,832	0	25,383	88,841	114,225	63,458	177,683	177,683	13,623	27,008
40	11,352,700	1.91%	217,165	252,497	0	25,250	88,374	113,624	63,124	176,748	176,748	13,623	26,794
45	11,352,700	1.88%	212,969	247,618	0	24,762	86,666	111,428	61,904	173,333	173,333	13,623	26,013
50	11,352,700	1.82%	206,447	240,035	0	24,003	84,012	108,016	60,009	168,024	168,024	13,623	24,799
55	11,352,700	1.82%	206,321	239,889	0	23,989	83,961	107,950	59,972	167,922	167,922	13,623	24,776
60	11,352,700	1.77%	200,543	233,171	0	23,317	81,610	104,927	58,293	163,220	163,220	13,623	23,700
65	11,352,700	1.75%	198,110	230,342	0	23,034	80,620	103,654	57,585	161,239	161,239	13,623	23,247
70	11,352,700	1.79%	203,711	236,854	0	23,685	82,899	106,584	59,214	165,798	165,798	13,623	24,290
75	11,352,700	1.81%	206,005	239,522	0	23,952	83,833	107,785	59,880	167,665	167,665	13,623	24,717
80	11,352,700	1.87%	211,885	246,358	0	24,636	86,225	110,861	61,589	172,450	172,450	13,623	25,811
85	11,352,700	1.88%	213,367	248,081	0	24,808	86,828	111,636	62,020	173,656	173,656	13,623	26,087
90	11,352,700	1.95%	220,938	256,884	0	25,688	89,909	115,598	64,221	179,818	179,818	13,623	27,496
95	11,352,700	1.93%	219,513	255,227	0	25,523	89,329	114,852	63,807	178,659	178,659	13,623	27,231
100	11,352,700	1.89%	215,063	250,053	0	25,005	87,518	112,524	62,513	175,037	175,037	13,623	26,403

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement: Summer steelhead using changes in PATH spring/summer chinook index stocks
Filter: Spring/summer chinook "equal weights"
Action: A4
Date: October 8, 1999

Wild Stocks												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Harvest					Pre-Spawning			LWG			
Year	Ocean Escapement	Ocean	Non-treaty	Treaty	Total	Tributary	Inriver	Total	Mortality	Escapement	Spawners	Total Adults
0	21,187	0	0	4,110	4,110	0	4,110	4,110	1,708	17,077	15,369	21,187
5	23,873	0	0	4,631	4,631	0	4,631	4,631	1,924	19,242	17,318	23,873
10	28,228	0	0	5,476	5,476	0	5,476	5,476	2,275	22,751	20,476	28,228
15	31,341	0	0	6,080	6,080	0	6,080	6,080	2,526	25,261	22,734	31,341
20	35,281	0	0	6,845	6,845	0	6,845	6,845	2,844	28,437	25,593	35,281
25	36,912	0	3,691	12,919	16,610	9,228	25,838	25,838	2,030	20,301	9,043	36,912
30	38,617	0	3,862	13,516	17,378	9,654	27,032	27,032	2,124	21,239	9,461	38,617
35	40,208	0	4,021	14,073	18,093	10,052	28,145	28,145	2,211	22,114	9,851	40,208
40	39,788	0	3,979	13,926	17,905	9,947	27,852	27,852	2,188	21,884	9,748	39,788
45	39,375	0	3,937	13,781	17,719	9,844	27,562	27,562	2,166	21,656	9,647	39,375
50	39,467	0	3,947	13,814	17,760	9,867	27,627	27,627	2,171	21,707	9,669	39,467
55	39,425	0	3,943	13,799	17,741	9,856	27,598	27,598	2,168	21,684	9,659	39,425
60	38,543	0	3,854	13,490	17,345	9,636	26,980	26,980	2,120	21,199	9,443	38,543
65	38,626	0	3,863	13,519	17,381	9,656	27,038	27,038	2,124	21,244	9,463	38,626
70	39,657	0	3,966	13,880	17,846	9,914	27,760	27,760	2,181	21,811	9,716	39,657
75	39,456	0	3,946	13,810	17,755	9,864	27,619	27,619	2,170	21,701	9,667	39,456
80	39,826	0	3,983	13,939	17,922	9,957	27,878	27,878	2,190	21,904	9,757	39,826
85	39,928	0	3,993	13,975	17,968	9,982	27,950	27,950	2,196	21,960	9,782	39,928
90	41,046	0	4,105	14,366	18,471	10,262	28,732	28,732	2,258	22,575	10,056	41,046
95	40,391	0	4,039	14,137	18,176	10,098	28,274	28,274	2,222	22,215	9,896	40,391
100	39,818	0	3,982	13,936	17,918	9,954	27,873	27,873	2,190	21,900	9,755	39,818

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
Statement Hatchery summer steelhead
Action: A4
Date: October 8, 1999

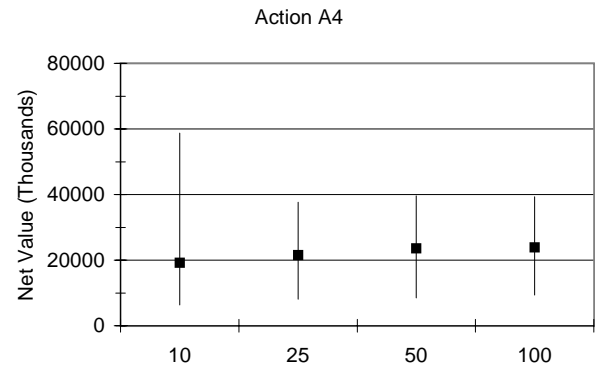
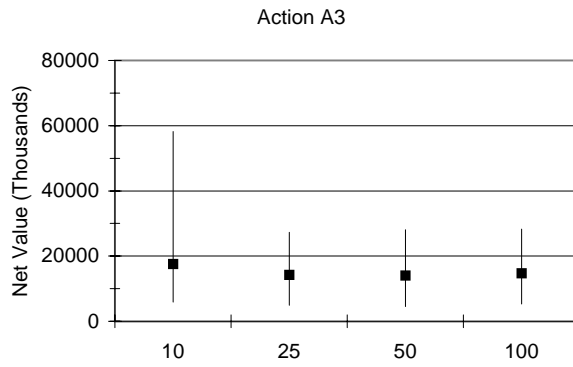
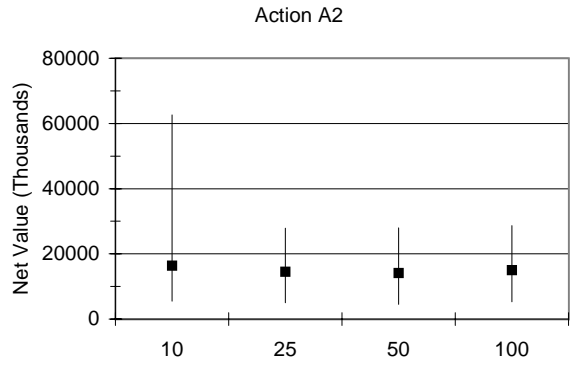
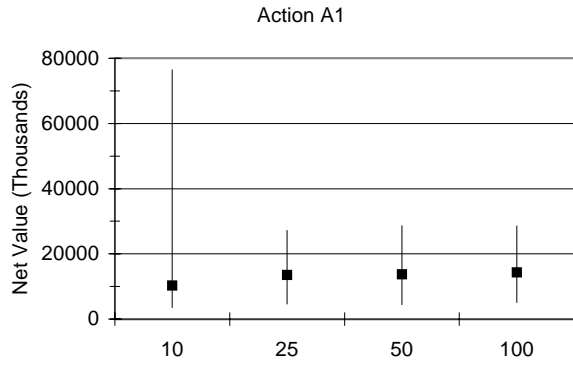
Hatchery Stocks													
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
	Adult		Ocean		Harvest								
Year	Production	Survival Rate	Total Adults	Escapement	Ocean	Mainstem			Tributary	Inriver	Total	Requirements	Surplus
						Non-treaty	Treaty	Total					
0	11,352,700	0.80%	90,822	105,598	0	10,560	25,977	36,537	40,233	76,770	76,770	13,623	429
5	11,352,700	0.62%	69,954	81,335	0	8,669	19,927	28,596	28,858	57,454	57,454	13,623	-1,124
10	11,352,700	1.31%	148,994	173,235	0	19,792	46,046	65,838	56,925	122,763	122,763	13,623	12,608
15	11,352,700	1.82%	206,311	239,877	0	20,464	68,749	89,213	72,539	161,752	161,752	13,623	30,936
20	11,352,700	2.21%	250,898	291,719	0	27,744	89,674	117,419	80,573	197,991	197,991	13,623	39,284
25	11,352,700	2.38%	270,093	314,036	0	31,404	109,913	141,316	78,509	219,825	219,825	13,623	36,644
30	11,352,700	2.50%	284,368	330,634	0	33,063	115,722	148,785	82,659	231,444	231,444	13,623	39,301
35	11,352,700	2.61%	295,778	343,900	0	34,390	120,365	154,755	85,975	240,730	240,730	13,623	41,425
40	11,352,700	2.57%	292,194	339,733	0	33,973	118,906	152,880	84,933	237,813	237,813	13,623	40,758
45	11,352,700	2.55%	289,378	336,459	0	33,646	117,761	151,407	84,115	235,521	235,521	13,623	40,234
50	11,352,700	2.56%	290,287	337,516	0	33,752	118,131	151,882	84,379	236,261	236,261	13,623	40,403
55	11,352,700	2.55%	290,038	337,227	0	33,723	118,029	151,752	84,307	236,059	236,059	13,623	40,356
60	11,352,700	2.50%	283,490	329,613	0	32,961	115,365	148,326	82,403	230,729	230,729	13,623	39,138
65	11,352,700	2.50%	284,290	330,543	0	33,054	115,690	148,744	82,636	231,380	231,380	13,623	39,287
70	11,352,700	2.58%	292,804	340,442	0	34,044	119,155	153,199	85,111	238,310	238,310	13,623	40,871
75	11,352,700	2.56%	290,644	337,931	0	33,793	118,276	152,069	84,483	236,551	236,551	13,623	40,469
80	11,352,700	2.59%	293,551	341,311	0	34,131	119,459	153,590	85,328	238,917	238,917	13,623	41,010
85	11,352,700	2.59%	294,412	342,312	0	34,231	119,809	154,040	85,578	239,618	239,618	13,623	41,170
90	11,352,700	2.66%	302,477	351,689	0	35,169	123,091	158,260	87,922	246,182	246,182	13,623	42,671
95	11,352,700	2.62%	297,241	345,601	0	34,560	120,960	155,520	86,400	241,921	241,921	13,623	41,697
100	11,352,700	2.58%	293,075	340,757	0	34,076	119,265	153,341	85,189	238,530	238,530	13,623	40,922

APPENDIX 3.B

Economic Values of Harvests by Hydrosystem Actions

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
 Statement: Anadromous fish net economic value for selected project years by hydrosystem action
 Data: PATH Results October 1998
 Filter: "Equal weights" scenario for "low" (25th percentile), "likely" (50th percentile), and "high" (75th percentile) modeling outputs
 Date: October 8, 1999

All Anadromous Fish Stocks



Upper Bound = 75th Percentile Lower Bound = 25th Percentile ■ Point Estimate = 50th Percentile

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Net economic value by species and action for "Likely" Modeling Outputs
Species: Spring/summer chinook
Filter: "equal weights"
Date: October 8, 1999

Project Years	Spring/Summer Chinook			
	A1	A2	A3	A4
	<u>Wild</u>			
0	\$155	\$155	\$155	\$155
5	\$190	\$207	\$221	\$226
10	\$280	\$305	\$316	\$337
15	\$382	\$390	\$405	\$484
20	\$493	\$556	\$556	\$823
25	\$452	\$500	\$501	\$1,022
30	\$486	\$520	\$523	\$1,280
35	\$573	\$599	\$610	\$1,521
40	\$555	\$570	\$585	\$1,482
45	\$516	\$536	\$544	\$1,429
50	\$476	\$436	\$459	\$1,442
55	\$477	\$443	\$464	\$1,443
60	\$414	\$389	\$408	\$1,322
65	\$401	\$387	\$399	\$1,327
70	\$464	\$429	\$452	\$1,479
75	\$469	\$437	\$460	\$1,456
80	\$514	\$522	\$532	\$1,513
85	\$523	\$542	\$548	\$1,536
90	\$609	\$614	\$629	\$1,695
95	\$584	\$591	\$601	\$1,610
100	\$537	\$547	\$556	\$1,518
	<u>Hatchery</u>			
0	\$173	\$173	\$173	\$173
5	\$29	\$65	\$52	\$45
10	\$53	\$240	\$239	\$247
15	\$323	\$560	\$490	\$538
20	\$465	\$835	\$693	\$940
25	\$455	\$799	\$657	\$1,155
30	\$480	\$819	\$675	\$1,397
35	\$561	\$931	\$776	\$1,613
40	\$558	\$905	\$757	\$1,556
45	\$518	\$851	\$706	\$1,508
50	\$478	\$713	\$611	\$1,526
55	\$477	\$711	\$611	\$1,525
60	\$420	\$637	\$547	\$1,407
65	\$397	\$620	\$527	\$1,421
70	\$449	\$677	\$585	\$1,570
75	\$467	\$701	\$605	\$1,535
80	\$505	\$816	\$684	\$1,591
85	\$517	\$852	\$706	\$1,610
90	\$595	\$954	\$799	\$1,762
95	\$585	\$934	\$775	\$1,664
100	\$539	\$869	\$721	\$1,583

Notes: 1. Thousands of 1998 dollars.
2. Regional economic impacts are based on spring/summer chinook "equal weights."

Source: Study.

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Net economic value by species and action for "Likely" Modeling Outputs
Species: Fall chinook
Filter: "base case"
Date: October 8, 1999

Project Years	Fall Chinook			
	A1	A2	A3	A4
	<u>Wild</u>			
0	\$39	\$39	\$39	\$69
5	\$60	\$60	\$60	\$51
10	\$81	\$81	\$89	\$281
15	\$92	\$92	\$109	\$690
20	\$98	\$98	\$115	\$855
25	\$100	\$100	\$118	\$908
30	\$98	\$98	\$117	\$924
35	\$100	\$100	\$119	\$929
40	\$100	\$100	\$120	\$936
45	\$98	\$98	\$119	\$929
50	\$99	\$99	\$119	\$932
55	\$99	\$99	\$118	\$944
60	\$97	\$97	\$119	\$933
65	\$100	\$100	\$119	\$913
70	\$101	\$101	\$121	\$935
75	\$98	\$98	\$119	\$940
80	\$100	\$100	\$119	\$932
85	\$99	\$99	\$119	\$934
90	\$97	\$97	\$122	\$922
95	\$99	\$99	\$118	\$925
100	\$101	\$101	\$119	\$930
	<u>Hatchery</u>			
0	\$125	\$125	\$125	\$125
5	\$162	\$64	\$64	\$95
10	\$1,528	\$142	\$156	\$496
15	\$4,610	\$179	\$214	\$2,342
20	\$4,459	\$196	\$233	\$2,579
25	\$4,749	\$202	\$239	\$2,603
30	\$4,827	\$199	\$238	\$2,638
35	\$4,794	\$201	\$243	\$2,631
40	\$4,790	\$194	\$235	\$2,623
45	\$4,851	\$235	\$282	\$2,691
50	\$4,942	\$236	\$282	\$2,703
55	\$4,942	\$238	\$280	\$2,727
60	\$4,835	\$233	\$281	\$2,719
65	\$4,881	\$239	\$281	\$2,662
70	\$4,842	\$240	\$288	\$2,703
75	\$4,916	\$235	\$282	\$2,718
80	\$4,915	\$241	\$281	\$2,703
85	\$4,947	\$236	\$282	\$2,720
90	\$4,817	\$233	\$288	\$2,654
95	\$4,909	\$237	\$279	\$2,698
100	\$4,911	\$242	\$283	\$2,697

Notes: 1. Thousands of 1998 dollars.
2. Regional economic impacts are based on fall chinook "base case"
Source: Study.

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Net economic value by species and action for "Likely" Modeling Outputs
Species: Summer steelhead
Filter: "equal weights"
Date: October 8, 1999

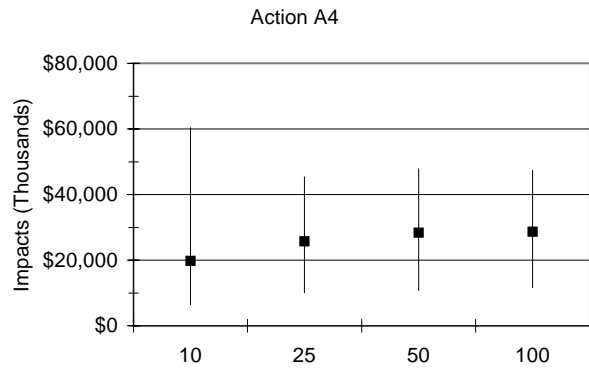
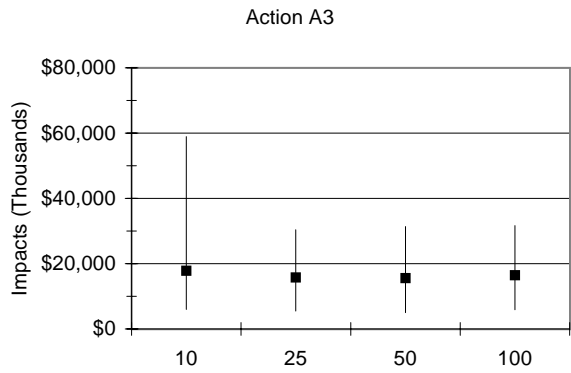
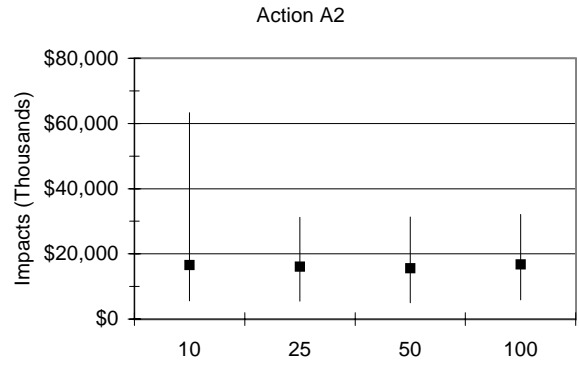
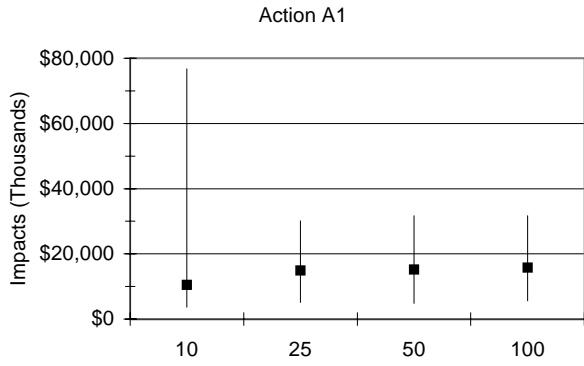
Project Years	Summer Steelhead			
	A1	A2	A3	A4
			<u>Wild</u>	
0	\$288	\$288	\$288	\$288
5	\$314	\$316	\$311	\$313
10	\$356	\$356	\$352	\$357
15	\$373	\$373	\$366	\$381
20	\$387	\$393	\$384	\$413
25	\$1,495	\$1,518	\$1,484	\$1,686
30	\$1,523	\$1,541	\$1,498	\$1,764
35	\$1,573	\$1,572	\$1,541	\$1,837
40	\$1,558	\$1,554	\$1,523	\$1,818
45	\$1,532	\$1,537	\$1,501	\$1,799
50	\$1,495	\$1,459	\$1,436	\$1,803
55	\$1,494	\$1,458	\$1,440	\$1,801
60	\$1,455	\$1,437	\$1,399	\$1,761
65	\$1,446	\$1,440	\$1,398	\$1,764
70	\$1,491	\$1,457	\$1,433	\$1,812
75	\$1,488	\$1,459	\$1,439	\$1,802
80	\$1,532	\$1,542	\$1,499	\$1,819
85	\$1,536	\$1,548	\$1,509	\$1,824
90	\$1,589	\$1,583	\$1,554	\$1,875
95	\$1,574	\$1,568	\$1,534	\$1,845
100	\$1,543	\$1,550	\$1,511	\$1,819
			<u>Hatchery</u>	
0	\$16,106	\$16,106	\$16,106	\$16,106
5	\$9,746	\$10,700	\$10,334	\$10,161
10	\$9,391	\$15,246	\$16,459	\$17,644
15	\$16,141	\$17,030	\$17,154	\$18,944
20	\$14,084	\$14,955	\$14,799	\$17,776
25	\$10,827	\$11,412	\$11,248	\$14,545
30	\$10,936	\$11,470	\$11,299	\$15,316
35	\$11,429	\$11,889	\$11,747	\$15,933
40	\$11,435	\$11,817	\$11,685	\$15,739
45	\$11,186	\$11,605	\$11,458	\$15,587
50	\$10,987	\$11,158	\$11,105	\$15,636
55	\$10,979	\$11,136	\$11,099	\$15,623
60	\$10,630	\$10,829	\$10,786	\$15,269
65	\$10,448	\$10,716	\$10,655	\$15,312
70	\$10,792	\$10,980	\$10,958	\$15,772
75	\$10,940	\$11,105	\$11,082	\$15,655
80	\$11,126	\$11,520	\$11,399	\$15,813
85	\$11,194	\$11,640	\$11,479	\$15,859
90	\$11,648	\$12,026	\$11,889	\$16,295
95	\$11,617	\$11,973	\$11,811	\$16,012
100	\$11,353	\$11,736	\$11,571	\$15,787

Notes: 1. Thousands of 1998 dollars.
2. Regional economic impacts are based on spring/summer chinook "equal weights."

Source: Study.

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study Project
 Statement: Anadromous fish regional economic impacts for selected project years by hydrosystem action
 Data: PATH Results October 1998
 Filter: "Equal weights" scenario for "low" (25th percentile), "likely" (50th percentile), and "high" (75th percentile) modeling outputs
 Date: October 8, 1999

All Anadromous Fish Stocks



Upper Bound = 75th Percentile Lower Bound = 25th Percentile ■ Point Estimate = 50th Percentile

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Regional economic impacts by species and action for "Likely" Modeling Outputs
Species: Spring/summer chinook
Filter: "equal weights"
Date: October 8, 1999

Project Years	Spring/Summer Chinook			
	A1	A2	A3	A4
	<u>Wild</u>			
0	\$180	\$180	\$180	\$180
5	\$225	\$246	\$259	\$267
10	\$365	\$399	\$409	\$440
15	\$520	\$533	\$551	\$662
20	\$687	\$777	\$776	\$1,146
25	\$645	\$714	\$716	\$1,454
30	\$692	\$742	\$746	\$1,811
35	\$816	\$854	\$870	\$2,139
40	\$791	\$815	\$835	\$2,083
45	\$735	\$765	\$775	\$2,008
50	\$681	\$626	\$659	\$2,024
55	\$683	\$635	\$665	\$2,022
60	\$592	\$558	\$585	\$1,854
65	\$574	\$554	\$571	\$1,860
70	\$664	\$615	\$648	\$2,069
75	\$671	\$627	\$660	\$2,037
80	\$733	\$747	\$761	\$2,114
85	\$745	\$773	\$782	\$2,144
90	\$866	\$876	\$897	\$2,362
95	\$831	\$844	\$857	\$2,245
100	\$764	\$782	\$792	\$2,119
	<u>Hatchery</u>			
0	\$231	\$231	\$231	\$231
5	\$33	\$84	\$65	\$55
10	\$73	\$352	\$349	\$364
15	\$484	\$849	\$741	\$816
20	\$704	\$1,268	\$1,054	\$1,425
25	\$704	\$1,240	\$1,020	\$1,769
30	\$739	\$1,268	\$1,046	\$2,117
35	\$860	\$1,435	\$1,196	\$2,423
40	\$856	\$1,397	\$1,168	\$2,336
45	\$796	\$1,316	\$1,092	\$2,264
50	\$739	\$1,116	\$955	\$2,288
55	\$737	\$1,113	\$955	\$2,284
60	\$652	\$1,000	\$858	\$2,113
65	\$617	\$973	\$826	\$2,132
70	\$695	\$1,059	\$914	\$2,347
75	\$723	\$1,097	\$946	\$2,295
80	\$777	\$1,265	\$1,060	\$2,375
85	\$794	\$1,316	\$1,091	\$2,399
90	\$909	\$1,468	\$1,230	\$2,617
95	\$896	\$1,441	\$1,196	\$2,476
100	\$826	\$1,344	\$1,113	\$2,360

Notes: 1. Thousands of 1998 dollars.
2. Regional economic impacts are based on spring/summer chinook "equal weights."

Source: Study.

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Regional economic impacts by species and action for "Likely" Modeling Outputs
Species: Fall chinook
Filter: "base case"
Date: October 8, 1999

Project Years	Fall Chinook			
	A1	A2	A3	A4
	<u>Wild</u>			
0	\$69	\$69	\$69	\$69
5	\$108	\$108	\$108	\$51
10	\$144	\$144	\$160	\$281
15	\$164	\$164	\$195	\$690
20	\$174	\$174	\$205	\$855
25	\$178	\$178	\$210	\$908
30	\$175	\$175	\$207	\$924
35	\$178	\$178	\$212	\$929
40	\$178	\$178	\$213	\$936
45	\$175	\$175	\$212	\$929
50	\$175	\$175	\$211	\$932
55	\$176	\$176	\$210	\$944
60	\$173	\$173	\$211	\$933
65	\$177	\$177	\$211	\$913
70	\$179	\$179	\$216	\$935
75	\$174	\$174	\$211	\$940
80	\$179	\$179	\$211	\$932
85	\$175	\$175	\$212	\$934
90	\$172	\$172	\$216	\$922
95	\$176	\$176	\$210	\$925
100	\$180	\$180	\$212	\$930
	<u>Hatchery</u>			
0	\$222	\$222	\$222	\$222
5	\$162	\$113	\$114	\$166
10	\$1,528	\$249	\$275	\$876
15	\$4,610	\$314	\$375	\$4,091
20	\$4,459	\$343	\$408	\$4,480
25	\$4,749	\$353	\$419	\$4,522
30	\$4,827	\$348	\$417	\$4,579
35	\$4,794	\$353	\$425	\$4,569
40	\$4,790	\$341	\$414	\$4,554
45	\$4,851	\$413	\$496	\$4,674
50	\$4,942	\$414	\$495	\$4,696
55	\$4,942	\$417	\$491	\$4,739
60	\$4,835	\$409	\$494	\$4,722
65	\$4,881	\$419	\$494	\$4,622
70	\$4,842	\$422	\$506	\$4,698
75	\$4,916	\$412	\$495	\$4,720
80	\$4,915	\$423	\$494	\$4,693
85	\$4,947	\$414	\$495	\$4,722
90	\$4,817	\$408	\$506	\$4,607
95	\$4,909	\$416	\$490	\$4,686
100	\$4,911	\$425	\$498	\$4,684

Notes: 1. Thousands of 1998 dollars.
2. Regional economic impacts are based on fall chinook "base case"
Source: Study.

Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Statement: Regional economic impacts by species and action for "Likely" Modeling Outputs
Species: Summer steelhead
Filter: "equal weights"
Date: October 8, 1999

Project Years	Summer Steelhead			
	A1	A2	A3	A4
	<u>Wild</u>			
0	\$336	\$336	\$336	\$336
5	\$367	\$369	\$364	\$366
10	\$417	\$417	\$413	\$418
15	\$438	\$439	\$430	\$448
20	\$456	\$463	\$452	\$487
25	\$1,568	\$1,592	\$1,557	\$1,769
30	\$1,597	\$1,616	\$1,571	\$1,850
35	\$1,650	\$1,649	\$1,616	\$1,926
40	\$1,634	\$1,630	\$1,598	\$1,906
45	\$1,607	\$1,612	\$1,574	\$1,887
50	\$1,568	\$1,530	\$1,506	\$1,891
55	\$1,567	\$1,530	\$1,510	\$1,889
60	\$1,526	\$1,507	\$1,467	\$1,847
65	\$1,516	\$1,510	\$1,466	\$1,851
70	\$1,563	\$1,528	\$1,503	\$1,900
75	\$1,560	\$1,530	\$1,509	\$1,890
80	\$1,607	\$1,618	\$1,572	\$1,908
85	\$1,611	\$1,624	\$1,582	\$1,913
90	\$1,667	\$1,660	\$1,630	\$1,967
95	\$1,651	\$1,645	\$1,609	\$1,935
100	\$1,619	\$1,626	\$1,585	\$1,908
	<u>Hatchery</u>			
0	\$15,665	\$15,665	\$15,665	\$15,665
5	\$9,525	\$10,461	\$10,102	\$9,932
10	\$9,275	\$15,078	\$16,281	\$17,455
15	\$16,147	\$17,039	\$17,163	\$18,958
20	\$14,391	\$15,282	\$15,123	\$18,171
25	\$11,434	\$12,054	\$11,879	\$15,370
30	\$11,549	\$12,115	\$11,934	\$16,187
35	\$12,072	\$12,558	\$12,408	\$16,840
40	\$12,078	\$12,482	\$12,342	\$16,635
45	\$11,814	\$12,258	\$12,102	\$16,474
50	\$11,604	\$11,784	\$11,729	\$16,526
55	\$11,595	\$11,761	\$11,721	\$16,511
60	\$11,225	\$11,436	\$11,391	\$16,137
65	\$11,033	\$11,316	\$11,252	\$16,182
70	\$11,397	\$11,596	\$11,572	\$16,670
75	\$11,553	\$11,729	\$11,703	\$16,546
80	\$11,751	\$12,168	\$12,040	\$16,712
85	\$11,822	\$12,294	\$12,125	\$16,762
90	\$12,303	\$12,703	\$12,558	\$17,223
95	\$12,270	\$12,647	\$12,476	\$16,923
100	\$11,991	\$12,397	\$12,222	\$16,685

Notes: 1. Thousands of 1998 dollars.
2. Regional economic impacts are based on spring/summer chinook "equal weights."

Source: Study.