Non-Treaty Storage Agreement

Technical Report: Appendices A - L

Bonneville
POWER ADMINISTRATION

March 1990

APPENDIX L

CUMULATIVE IMPACTS

Part 2

Anadromous Fish

Water Budget/Flow and Vernita Bar
Overgeneration Spill
Survival

APPENDIX L

Part 2

Anadromous Fish

Water Budget/Flow and Vernita Bar

The frequency of water budget flows less than 134 kcfs at Priest Rapids during the month of May based on SAM study results.

The frequency of flows greater than 125 kcfs in October and November at Priest Rapids.

The frequency of flows less than 70 kcfs December through April at Priest Rapids.

Change in average monthly flows at The Dalles, Priest Rapids, and Lower Granite dams.

Overgeneration Spill

Overgeneration spill tables showing:

The change in overgeneration spill (MWs) caused by the upgrade and expansion of the intertie without the proposed NTSA.

The total change in overgeneration spill (MWs) caused by the upgrade and expansion of the intertie and the proposed NTSA used as an opportnity resource.

The amount of overgeneration spill (MWs) that existed prior to the expansion and upgrade of the intertie.

Survival

An additional study was analyzed to separate out the effects of the increased intertie size from the IDU on survival.

The relative change in mean survival for the contract years 1991, 1993, 1995, 1997, 2001, and 2005. (The difference in mean survival between the proposal and the No-Action alternatives divided by the No-Action alternative survival).

The frequency of relative survival increases and decreases greater than 1 and 5 percent for the contract years 1991, 1993, 1995, 1997, 2001, and 2005.

STUDY KEY

AEXBAARO - No-Action Alternative with the existing intertie size prior to the IDU expansion and upgrade and the 1987 spill plan (also referred to as the base case on some tables).

GMXA1SAS - Proposed Alternative used as an opportunity resource with the maximum intertie size and the signed Spill Agreement.

HMXA2SAS - Proposed Alternative used as a firm resource with the maximum intertie size and the signed Spill Agreement.

AMXBAARO - No-Action Alternative with the maximum intertie size (used to separate the effects of the expanded intertie size from Proposed Action for overgeneration spill and survival analysis).

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23
Incr Study: GMXA1SAS : NTS : TE3AC : 2.5 MAF : SPILL AGREEMENT SIGNED Date: 26-JUN-89 19:00:23
Difference = (Incr Study) - (Base Study)
Number of Games: 200
Typical Water Years (Mid 80 Percent)

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Frequency Distribution

		Grand Coulee Elev LT 1240 feet			Priest Rapids Discharge GE 125 kcfs						Priest Rapids Discharge LT 134 kcfs		
		(Base)	(Incr)	(Diff)	(Base)		(Incr)		(Diff)		(Base)	(Incr)	(Diff)
Year	Num	May	May	May	Oct	Nov	Oct	Nov	Oct	Nov	May	May	May
1989	153	34	34	0	1	1	1	1	0	0	4	4	0
1990	154	34	34	0	1	13	5	11	4	-2	6	6	0
1991	154	42	42	0	5	12	8	9	3	-3	1	1	0
1992	160	35	35	0	7	5	7	5	0	0	2	2	0
1993	155	38	38	0	5	6	3	8	-2	2	6	7	1
1994	155	37	37	0	3	1	0	4	-3	3	7	7	0
1995	154	38	38	0	0	0	0	0	0	0	5	5	0
1996	148	32	32	0	0	0	0	2	0	2	3	3	0
1997	155	37	37	0	0	1	0	1	0	0	5	5	0
1998	155	43	43	0	0	5	2	3	2	-2	5	5	0
1999	149	30	30	0	0	4	0	1	0	-3	5	5	0
2000	151	41	41	0	0	0	0	0	0	0	1	1	0
2001	152	45	45	0	0	1	0	2	0	1	3	3	0
2002	157	33	33	0	0	6	3	7	3	1	5	5	0
2003	163	40	40	0	0	2	0	1	0	-1	4	4	0
2004	146	40	40	0	0	2	0	0	0	-2	2	2	0
2005	151	31	31	0	0	1	0	0	0	-1	7	7	0
2006	145	36	36	0	0	2	1	2	1	0	2	2	0
2007	155	23	23	0	0	2	0	0	0	-2	8	8	0
2008	159	49	49	0	0	0	0	0	0	0	4	4	0

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*****************************************************************************************************************************
                                                BPAHYSUM Summary
Base Study:    AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI          Date:   6-OCT-89 16:00:23
Incr Study:    GMXA1SAS : NTS : TE3AC : 2.5 MAF : SPILL AGREEMENT SIGNED          Date:  26-JUN-89 19:00:23
Difference = (Incr Study) - (Base Study)
Number of Games: 200
Low Water Years (Bottom 10 Percent)
*****************************************************************************************************************************
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Frequency Distribution

		Grand Coulee Elev LT 1240 feet			Priest Rapids Discharge GE 125 kcfs						Priest Rapids Discharge LT 134 kcfs		
		(Base)	(Incr)	(Diff)	(Base)		(Incr)		(Diff)		(Base)	(Incr)	(Diff)
Year	Num	May	May	May	Oct	Nov	Oct	Nov	Oct	Nov	May	May	May
1989	25	0	0	0	0	0	0	0	0	0	0	0	0
1990	27	0	0	0	0	0	0	0	0	0	0	0	0
1991	26	0	0	0	0	0	0	0	0	0	1	1	0
1992	18	0	0	0	0	0	0	0	0	0	1	1	0
1993	21	0	0	0	0	0	0	0	0	0	0	0	0
1994	30	0	0	0	0	0	0	0	0	0	1	1	0
1995	31	0	0	0	0	0	0	0	0	0	0	0	0
1996	29	0	0	0	0	0	0	0	0	0	1	0	-1
1997	29	0	0	0	0	0	0	0	0	0	1	1	0
1998	23	0	0	0	0	0	0	0	0	0	1	2	1
1999	33	0	0	0	0	0	0	0	0	0	4	4	0
2000	27	0	0	0	0	0	0	0	0	0	0	0	0
2001	31	0	0	0	0	0	0	0	0	0	0	0	0
2002	25	0	0	0	0	0	0	0	0	0	1	1	0
2003	23	0	0	0	0	0	0	0	0	0	1	1	0
2004	24	0	0	0	0	0	0	0	0	0	0	0	0
2005	30	0	0	0	0	0	0	0	0	0	0	0	0
2006	32	0	0	0	0	0	0	0	0	0	1	1	0
2007	23	0	0	0	0	0	0	0	0	0	0	0	0
2008	26	0	0	0	0	0	0	0	0	0	3	3	0

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BPAHYSUM Summary

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Difference = (Incr Study) - (Base Study)
Number of Games: 200
High Water Years (Top 10 Percent)

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Frequency Distribution

		Grand Coulee Elev LT 1240 feet			Priest Rapids Discharge GE 125 kcfs						Priest Rapids Discharge LT 134 kcfs		
		(Base)	(Incr)	(Diff)	(Base)		(Incr)		(Diff)		(Base)	(Incr)	(Diff)
Year	Num	May	May	May	Oct	Nov	Oct	Nov	Oct	Nov	May	May	May
1989	22	0	0	0	0	0	0	0	0	0	0	0	0
1990	19	0	0	0	0	0	0	0	0	0	0	0	0
1991	20	0	0	0	0	0	0	0	0	0	0	0	0
1992	22	0	0	0	0	0	0	0	0	0	0	0	0
1993	24	0	0	0	0	0	0	0	0	0	0	0	0
1994	15	0	0	0	0	0	0	0	0	0	0	0	0
1995	15	0	0	0	0	0	0	0	0	0	0	0	0
1996	23	0	0	0	0	0	0	0	0	0	0	0	0
1997	16	0	0	0	0	0	0	0	0	0	0	0	0
1998	22	0	0	0	0	0	0	0	0	0	0	0	0
1999	18	0	0	0	0	0	0	0	0	0	0	0	0
2000	22	0	0	0	0	0	0	0	0	0	0	0	0
2001	17	0	0	0	0	0	0	0	0	0	0	0	0
2002	18	0	0	0	0	0	0	0	0	0	0	0	0
2003	14	0	0	0	0	0	0	0	0	0	0	0	0
2004	30	0	0	0	0	0	0	0	0	0	0	0	0
2005	19	0	0	0	0	0	0	0	0	0	0	0	0
2006	23	0	0	0	0	0	0	0	0	0	0	0	0
2007	22	0	0	0	0	0	0	0	0	0	0	0	0
2008	15	0	0	0	0	0	0	0	0	0	0	0	0

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Difference = (Incr Study) - (Base Study)
Number of Games: 200
Typical Water Years (Mid 80 Percent)

****

Frequency Distribution

Priest Rapids Discharge
LT 70 kcfs

		--- (Base) ---						--- (Incr) ---						--- (Diff) ---					
Year	Num	Dec	Jan	Feb	Mar	Ap1	Ap2	Dec	Jan	Feb	Mar	Ap1	Ap2	Dec	Jan	Feb	Mar	Ap1	Ap2
1989	153	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0
1990	154	0	0	1	2	0	4	0	0	0	0	0	4	0	0	-1	-2	0	0
1991	154	0	0	1	2	0	0	0	0	0	0	0	0	0	0	-1	-2	0	0
1992	160	0	0	3	3	0	0	0	0	0	1	0	0	0	0	-3	-2	0	0
1993	155	0	0	1	3	0	0	0	0	1	3	0	0	0	0	0	0	0	0
1994	155	0	0	2	3	2	0	0	0	1	4	2	0	0	0	-1	1	0	0
1995	154	0	0	1	3	1	0	0	0	2	3	1	0	0	0	1	0	0	0
1996	148	1	0	0	2	0	0	2	0	0	1	0	0	1	0	0	-1	0	0
1997	155	0	0	1	4	1	2	0	0	1	3	1	0	0	0	0	-1	0	-2
1998	155	0	0	2	4	1	0	0	0	1	2	1	0	0	0	-1	-2	0	0
1999	149	0	1	1	4	1	0	0	1	1	4	1	0	0	0	0	0	0	0
2000	151	0	0	0	3	0	0	0	0	0	2	0	0	0	0	0	-1	0	0
2001	152	1	0	1	2	0	1	0	0	0	2	0	0	-1	0	-1	0	0	-1
2002	157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	163	0	0	0	4	0	1	0	0	0	4	0	1	0	0	0	0	0	0
2004	146	0	0	0	3	0	0	0	0	0	3	0	1	0	0	0	0	0	1
2005	151	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	-1
2006	145	0	0	0	3	0	1	0	0	0	3	0	0	0	0	0	0	0	-1
2007	155	0	0	1	4	0	6	0	0	0	4	1	1	0	0	-1	0	1	-5
2008	159	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	-1	0	-2

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BPAHYSUM Summary

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Difference = (Incr Study) - (Base Study)
Number of Games: 200
Low Water Years (Bottom 10 Percent)

****

Frequency Distribution

Priest Rapids Discharge
LT 70 kcfs

		--- (Base) ---						--- (Incr) ---						--- (Diff) ---					
Year	Num	Dec	Jan	Feb	Mar	Ap1	Ap2	Dec	Jan	Feb	Mar	Ap1	Ap2	Dec	Jan	Feb	Mar	Ap1	Ap2
1989	25	0	0	3	1	0	0	0	0	3	1	0	0	0	0	0	0	0	0
1990	27	0	0	2	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0
1991	26	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0
1992	18	0	0	1	1	1	1	0	0	1	1	1	1	0	0	0	0	0	0
1993	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	30	0	0	3	1	1	1	0	0	3	1	1	1	0	0	0	0	0	0
1995	31	0	0	4	0	0	0	0	0	3	0	0	0	0	0	-1	0	0	0
1996	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	29	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	-1	0	0
1998	23	0	0	1	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0
1999	33	0	0	3	4	3	3	0	0	1	3	3	3	0	0	-2	-1	0	0
2000	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	31	0	0	1	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0
2002	25	0	0	1	1	1	1	0	0	0	1	1	1	0	0	-1	0	0	0
2003	23	0	0	2	1	0	0	0	0	1	1	0	0	0	0	-1	0	0	0
2004	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0
2006	32	0	0	2	1	0	0	0	0	0	0	0	0	0	0	-2	-1	0	0
2007	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	26	0	0	0	1	2	3	0	0	0	1	1	2	0	0	0	0	-1	-1

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23
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Difference = (Incr Study) - (Base Study)
Number of Games: 200
High Water Years (Top 10 Percent)

****

Frequency Distribution

Priest Rapids Discharge
LT 70 kcfs

		--- (Base) ---						--- (Incr) ---						--- (Diff) ---					
Year	Num	Dec	Jan	Feb	Mar	Ap1	Ap2	Dec	Jan	Feb	Mar	Ap1	Ap2	Dec	Jan	Feb	Mar	Ap1	Ap2
1989	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23

Number of Games: 200

Average Over Typical Water Years (Mid 80 Percent)

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Priest Rapids Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	153	80	90	97	115	148	133	122	106	120	154	153	140	111	87	120
1990	154	82	90	97	114	153	139	122	103	126	155	152	145	114	88	122
1991	154	85	89	93	114	149	139	127	108	121	156	153	145	113	90	122
1992	160	86	91	91	111	145	133	126	109	133	156	153	144	118	88	122
1993	155	87	88	90	112	151	136	127	114	124	156	151	142	109	85	121
1994	155	78	84	86	109	152	143	128	117	125	159	148	141	109	85	120
1995	154	81	83	87	112	155	142	129	112	127	160	150	144	109	85	122
1996	148	76	81	84	108	152	143	132	114	128	158	150	144	111	86	121
1997	155	77	84	88	113	155	145	133	116	131	157	150	147	110	85	123
1998	155	81	85	90	113	155	143	131	119	134	161	154	144	109	84	123
1999	149	76	80	85	111	154	143	131	118	133	159	155	151	111	85	122
2000	151	73	81	87	115	158	148	139	128	139	163	156	147	109	85	125
2001	152	77	81	87	112	156	145	135	122	133	164	156	144	110	85	124
2002	157	75	82	88	113	151	137	126	116	129	155	151	143	106	83	120
2003	163	71	79	85	113	154	144	135	124	137	168	152	143	109	83	123
2004	146	73	78	83	112	153	142	137	121	133	162	154	145	107	85	122
2005	151	75	79	83	111	154	142	133	120	138	158	156	150	108	85	122
2006	145	71	77	84	113	152	140	132	122	139	164	153	142	109	84	121
2007	155	77	80	86	112	154	142	131	114	130	153	153	146	107	83	121
2008	159	70	78	83	114	158	147	137	125	132	157	155	153	111	86	123
AVERAGE		78	83	88	112	153	141	130	116	131	159	153	145	110	85	122

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23
Incr Study: GMXA1SAS : NTS : TE3AC : 2.5 MAF : SPILL AGREEMENT SIGNED Date: 26-JUN-89 19:00:23
Difference = (Incr Study) - (Base Study)
Number of Games: 200
Average Over Typical Water Years (Mid 80 Percent)

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Difference Of
Priest Rapids Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	153	0	0	0	0	0	-2	1	0	1	0	0	0	0	0	0
1990	154	0	6	5	3	-1	-3	1	0	0	0	-1	-1	0	0	1
1991	154	3	3	2	1	1	-4	-1	1	-1	-1	-2	-2	0	0	0
1992	160	3	2	3	1	2	0	0	-2	-3	-1	-2	-2	-1	-1	0
1993	155	1	2	3	2	5	2	-1	-3	-2	-2	-3	-2	2	3	1
1994	155	7	4	4	3	2	0	-1	-1	-2	-3	-1	-3	2	2	1
1995	154	5	1	2	1	0	-1	-4	-2	-3	-3	-2	-4	2	2	0
1996	148	6	1	3	1	-1	-3	-2	-2	-3	-3	-2	-3	3	3	0
1997	155	6	1	1	1	-3	-5	-3	-3	-3	-3	-3	-4	3	3	-1
1998	155	6	2	1	-2	-2	-3	-3	-3	-4	-3	-2	-4	3	3	-1
1999	149	6	3	1	-1	-2	-3	-1	-3	-6	-3	-3	-4	2	2	-1
2000	151	7	2	1	-1	-3	-5	-2	-3	-4	-3	-1	-4	2	1	-1
2001	152	8	2	3	0	-1	-3	0	-5	-4	-3	-3	-3	4	4	0
2002	157	8	3	2	-1	1	-1	0	-3	-4	-3	-2	-3	3	3	0
2003	163	7	1	1	-1	-3	-5	-3	-5	-5	-5	-3	-3	3	3	-1
2004	146	8	2	3	-1	-3	-4	-3	-3	-5	-4	-2	-2	4	4	0
2005	151	8	3	3	1	-2	-3	-2	-5	-5	-3	-1	-2	3	3	0
2006	145	8	3	2	0	-2	-4	-3	-3	-3	-3	-1	-2	3	3	0
2007	155	7	1	2	1	-3	-4	-2	-1	-3	-3	-1	-4	3	3	0
2008	159	8	1	2	1	-3	-4	-3	-2	-3	-2	-1	-4	2	1	-1
AVERAGE		6	2	2	1	-1	-3	-2	-2	-3	-3	-2	-3	2	2	0

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23

Number of Games: 200

Average Over Low Water Years (Bottom 10 Percent)

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Priest Rapids Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	25	75	86	90	108	94	84	82	79	90	134	72	60	68	74	87
1990	27	81	87	89	105	102	84	88	88	98	134	76	58	64	76	89
1991	26	79	84	85	103	100	86	85	81	89	133	74	62	75	79	88
1992	18	84	88	87	107	102	83	87	84	92	132	75	61	76	81	89
1993	21	82	86	83	103	100	86	90	90	97	134	72	63	73	79	89
1994	30	73	82	84	101	98	84	85	85	92	133	73	64	75	79	87
1995	31	76	82	84	102	99	84	85	85	92	134	74	65	77	81	88
1996	29	75	83	83	103	97	87	89	90	96	134	76	64	77	80	89
1997	29	73	80	82	100	102	85	90	93	101	133	67	62	75	82	87
1998	23	73	78	81	100	101	88	89	91	95	133	73	64	81	79	88
1999	33	71	77	80	100	103	84	83	84	92	130	77	58	70	78	85
2000	27	70	75	80	101	101	86	88	90	95	134	83	60	75	81	87
2001	31	72	74	79	97	101	86	86	86	94	134	79	60	74	77	86
2002	25	72	79	84	103	102	88	86	92	98	132	82	59	75	80	88
2003	23	67	74	80	99	97	85	85	87	93	133	83	68	73	76	86
2004	24	69	74	75	99	99	86	88	90	96	134	81	66	73	77	87
2005	30	71	74	79	99	100	86	87	90	96	134	85	66	73	77	87
2006	32	68	74	79	101	99	87	87	90	93	134	82	66	68	77	87
2007	23	70	72	78	101	99	88	86	91	92	134	85	65	68	75	87
2008	26	64	71	78	101	101	91	85	84	90	129	83	63	73	75	86
AVERAGE		73	79	82	102	100	86	86	88	94	133	78	63	73	78	87

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23
Incr Study: GMXA1SAS : NTS : TE3AC : 2.5 MAF : SPILL AGREEMENT SIGNED Date: 26-JUN-89 19:00:23
Difference = (Incr Study) - (Base Study)
Number of Games: 200
Average Over Low Water Years (Bottom 10 Percent)

****

Difference Of
Priest Rapids Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	25	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1990	27	0	6	6	5	7	10	9	3	3	0	5	1	1	0	4
1991	26	4	3	4	2	4	5	5	1	1	0	2	0	-1	-1	2
1992	18	3	4	4	3	8	10	5	3	3	0	2	0	0	0	3
1993	21	2	1	2	2	6	9	3	2	2	0	2	1	0	0	2
1994	30	8	5	4	3	9	5	2	2	2	0	2	1	-1	-1	3
1995	31	6	3	3	2	7	6	3	2	3	0	3	1	0	-1	3
1996	29	7	3	3	4	8	8	4	2	3	0	4	0	-1	0	4
1997	29	8	4	3	4	6	6	4	0	0	0	4	2	-1	0	3
1998	23	7	4	3	0	5	6	3	2	1	0	4	1	1	1	3
1999	33	7	3	3	0	7	5	0	1	0	0	8	6	4	3	4
2000	27	10	4	3	0	8	7	0	0	0	0	9	5	2	2	4
2001	31	10	6	5	0	9	7	1	0	0	0	10	8	2	2	5
2002	25	10	4	3	0	9	10	0	-1	-1	0	8	4	0	1	4
2003	23	8	4	2	0	6	7	0	1	0	-1	6	3	0	1	3
2004	24	9	3	3	0	9	10	0	2	0	0	7	4	0	0	4
2005	30	10	5	5	5	8	11	4	2	2	0	6	2	-1	-1	5
2006	32	9	4	4	4	5	8	3	3	2	0	5	3	0	0	4
2007	23	10	4	3	5	6	9	4	3	2	0	6	1	0	0	4
2008	26	9	3	3	4	5	5	2	2	1	0	2	1	-1	0	3
AVERAGE		7	4	3	2	7	7	3	1	1	0	5	2	0	0	3

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23

Number of Games: 200

Average Over High Water Years (Top 10 Percent)

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Priest Rapids Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	22	77	105	112	120	142	131	154	133	152	216	273	185	122	108	148
1990	19	81	100	110	121	143	133	160	133	164	227	270	187	124	108	150
1991	20	84	99	104	120	144	135	157	131	148	213	275	187	125	111	148
1992	22	84	100	101	118	145	137	158	134	144	206	282	190	129	113	148
1993	24	86	92	100	117	143	135	164	142	168	229	267	181	120	105	149
1994	15	74	92	102	119	144	146	169	142	161	228	273	184	124	108	150
1995	15	76	90	99	117	148	145	164	139	144	217	283	188	128	112	149
1996	23	74	83	95	120	145	149	172	145	172	238	268	182	121	105	150
1997	16	74	89	98	116	147	146	163	140	154	227	279	186	125	110	149
1998	22	76	97	103	119	146	142	165	140	153	223	276	185	124	109	150
1999	18	72	98	103	119	148	139	160	138	134	208	285	189	130	114	148
2000	22	70	89	102	120	146	150	169	143	163	231	273	184	124	108	150
2001	17	72	86	99	119	145	144	166	141	161	232	275	184	123	108	149
2002	18	72	91	101	120	146	145	166	142	158	227	273	185	124	108	149
2003	14	66	94	102	122	146	143	160	139	147	221	279	187	127	112	149
2004	30	71	86	97	120	147	147	165	140	156	229	276	185	125	110	149
2005	19	70	86	97	119	147	150	165	141	161	232	274	184	124	109	149
2006	23	68	85	97	120	147	150	167	142	158	231	277	185	126	110	150
2007	22	69	82	98	120	146	150	169	142	163	232	273	184	124	108	149
2008	15	67	88	96	124	147	150	167	143	162	235	275	184	125	108	150
AVERAGE		74	91	101	120	145	143	164	139	157	225	275	185	125	109	149

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23
Incr Study: GMXA1SAS : NTS : TE3AC : 2.5 MAF : SPILL AGREEMENT SIGNED Date: 26-JUN-89 19:00:23
Difference = (Incr Study) - (Base Study)
Number of Games: 200
Average Over High Water Years (Top 10 Percent)

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Difference Of
Priest Rapids Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	22	0	0	0	0	0	-7	3	0	1	1	1	0	2	1	0
1990	19	0	5	1	1	-4	-4	0	1	0	-1	1	0	0	0	0
1991	20	3	2	0	0	0	-6	-2	2	0	-3	-4	-4	-2	-1	-1
1992	22	3	1	3	0	1	-2	-6	-1	-2	-1	-4	-7	-1	-1	-1
1993	24	1	2	4	1	4	3	-4	-3	-5	-3	-6	-8	-1	-1	-1
1994	15	9	4	4	0	3	-2	-7	-3	-4	-7	-7	-10	-2	-1	-1
1995	15	8	5	3	2	0	-5	-9	-1	-1	-8	-10	-10	-3	-3	-2
1996	23	9	2	5	-2	-1	-7	-7	-2	-3	-8	-9	-9	-2	-1	-3
1997	16	9	3	6	2	1	-4	-6	-2	-2	-9	-9	-8	-3	-3	-2
1998	22	10	0	-2	-1	2	-2	-4	-2	-3	-8	-8	-7	-2	-2	-2
1999	18	9	-3	-2	-2	0	0	-4	-1	-1	-7	-9	-6	-4	-4	-2
2000	22	11	1	0	-3	1	-3	-4	0	-1	-8	-7	-4	-1	-1	-1
2001	17	10	1	0	-2	2	-3	-3	-2	-2	-9	-8	-5	-1	-1	-2
2002	18	9	2	-3	-3	2	-1	-2	-1	-2	-8	-3	-5	-2	-2	-1
2003	14	9	-2	-4	-4	-1	-4	-2	-1	-3	-10	-5	-6	-3	-3	-3
2004	30	10	2	0	-2	-1	-6	-3	1	-2	-10	-5	-5	-2	-2	-2
2005	19	9	0	-1	-3	-2	-5	-3	-1	-2	-9	-4	-4	-1	-1	-2
2006	23	10	2	-1	-2	1	-5	-4	0	-2	-9	-5	-5	-2	-2	-2
2007	22	9	2	-2	-2	0	-3	-3	-3	-3	-9	-9	-6	-4	-4	-2
2008	15	11	0	0	-3	1	-3	-4	-4	-3	-9	-7	-4	0	0	-2
AVERAGE		7	2	1	-1	0	-3	-3	-1	-2	-7	-6	-6	-2	-2	-2

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23
Incr Study: GMXA1SAS : NTS : TE3AC : 2.5 MAF : SPILL AGREEMENT SIGNED Date: 26-JUN-89 19:00:23
Difference = (Incr Study) - (Base Study)
Number of Games: 200
Average Over Typical Water Years (Mid 80 Percent)

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Difference Of
LWG Discharge (QTDA - QPRD)

YEAR / NUM		SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	154	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	154	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1992	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	155	0	0	0	0	0	0	0	0	0	1	-1	0	0	0	0
1994	155	0	0	0	0	0	0	0	1	0	1	-1	0	0	0	0
1995	154	0	0	0	0	0	0	0	1	0	1	-1	0	0	0	0
1996	148	0	0	0	0	0	0	0	1	0	0	-1	0	0	0	0
1997	155	0	0	0	0	0	0	0	1	-1	0	-1	0	0	0	0
1998	155	0	0	0	0	0	0	0	0	0	1	-1	0	0	0	0
1999	149	0	0	0	0	0	0	0	1	-1	1	-1	0	0	0	0
2000	151	0	0	0	0	0	0	0	1	0	1	-1	0	0	0	0
2001	152	0	0	0	0	0	0	0	1	0	1	-1	0	0	0	0
2002	157	0	0	0	0	0	0	0	0	0	1	-1	0	0	0	0
2003	163	0	0	0	0	0	0	0	1	-1	1	-1	0	0	0	0
2004	146	0	0	0	0	0	0	0	1	-1	1	-1	0	0	0	0
2005	151	0	0	0	0	0	0	0	1	-1	1	-1	0	0	0	0
2006	145	0	0	0	0	0	0	0	1	-1	1	-1	0	0	0	0
2007	155	0	0	0	0	0	0	0	1	-1	0	-1	0	0	0	0
2008	159	0	0	0	0	0	0	0	1	0	1	-1	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	1	0	1	-1	0	0	0	0

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23
Incr Study: GMXA1SAS : NTS : TE3AC : 2.5 MAF : SPILL AGREEMENT SIGNED Date: 26-JUN-89 19:00:23
Difference = (Incr Study) - (Base Study)
Number of Games: 200
Average Over Low Water Years (Bottom 10 Percent)

****

Difference Of
LWG Discharge (QTDA - QPRD)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	21	0	0	0	-1	0	0	0	1	0	0	0	0	0	0	0
1994	30	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1995	31	-1	0	0	-1	0	0	0	0	0	0	0	0	0	0	0
1996	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	23	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0
1999	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	24	0	0	0	-1	0	0	0	0	0	0	0	1	0	1	0
2005	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	23	-1	0	0	-1	0	0	0	0	0	0	0	0	0	0	0
2008	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23
Incr Study: GMXA1SAS : NTS : TE3AC : 2.5 MAF : SPILL AGREEMENT SIGNED Date: 26-JUN-89 19:00:23
Difference = (Incr Study) - (Base Study)
Number of Games: 200
Average Over High Water Years (Top 10 Percent)

****

Difference Of
LWG Discharge (QTDA - QPRD)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	22	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1990	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	15	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0
1996	23	-1	0	0	0	0	0	0	0	-1	0	0	0	0	0	0
1997	16	-1	0	0	0	0	0	1	0	-1	0	0	0	0	0	0
1998	22	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0
1999	18	0	0	0	0	0	0	0	0	-1	0	-1	0	0	0	0
2000	22	0	0	0	0	1	1	0	0	-1	0	0	0	0	0	0
2001	17	0	0	0	0	0	1	-1	0	0	0	0	0	0	0	0
2002	18	0	0	0	0	0	0	0	0	-1	0	-1	0	0	0	0
2003	14	0	0	0	0	0	1	-1	1	0	0	-1	0	0	0	0
2004	30	0	0	0	0	0	0	0	1	-1	0	0	0	0	0	0
2005	19	0	0	0	0	0	1	-1	1	0	0	0	0	0	0	0
2006	23	0	0	0	0	0	0	1	0	-1	0	0	0	0	0	0
2007	22	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0
2008	15	0	0	0	0	0	0	1	0	-1	0	0	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23

Number of Games: 200

Average Over Typical Water Years (Mid 80 Percent)

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The Dalles Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	153	115	128	141	167	200	204	194	198	223	260	259	189	143	113	183
1990	154	115	127	140	166	205	209	194	197	237	263	257	195	147	115	185
1991	154	119	127	138	167	202	209	199	199	222	261	257	194	146	117	184
1992	160	120	128	134	166	202	206	199	203	241	262	258	195	151	116	185
1993	155	121	125	132	162	202	205	199	207	230	263	254	192	142	113	183
1994	155	111	120	129	162	205	211	200	208	229	266	246	188	142	113	182
1995	154	114	121	130	162	206	210	199	203	235	271	254	192	142	113	184
1996	148	108	118	127	160	207	215	203	204	233	264	250	192	144	114	183
1997	155	109	121	132	164	209	214	203	208	231	259	252	195	143	112	184
1998	155	113	123	133	165	207	211	204	214	241	265	255	194	142	112	185
1999	149	109	116	128	164	210	216	202	212	242	267	260	201	144	113	186
2000	151	105	119	132	170	215	220	211	222	242	269	258	194	141	112	188
2001	152	109	119	130	165	210	219	209	216	241	272	262	194	143	113	187
2002	157	107	119	131	163	201	202	196	207	229	259	250	191	139	110	180
2003	163	102	116	129	165	209	216	207	220	247	277	254	192	141	111	186
2004	146	105	115	126	165	208	215	209	212	242	272	263	195	140	112	186
2005	151	107	116	126	164	209	215	207	214	250	269	266	201	141	112	187
2006	145	103	114	127	166	207	211	207	221	252	272	252	191	142	112	184
2007	155	108	117	128	162	206	208	201	203	231	256	250	194	139	110	181
2008	159	102	115	126	166	212	212	207	216	231	258	258	202	144	113	184
AVERAGE		110	120	131	165	207	211	202	209	236	265	256	194	143	113	184

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23
Incr Study: GMXA1SAS : NTS : TE3AC : 2.5 MAF : SPILL AGREEMENT SIGNED Date: 26-JUN-89 19:00:23
Difference = (Incr Study) - (Base Study)
Number of Games: 200
Average Over Typical Water Years (Mid 80 Percent)

****

Difference Of
The Dalles Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	153	0	0	0	0	0	-2	1	0	1	0	0	0	0	0	0
1990	154	0	6	5	3	-1	-3	1	0	0	0	-1	-1	0	0	1
1991	154	3	3	2	1	1	-4	-1	1	-2	-1	-2	-2	0	0	0
1992	160	3	2	3	1	2	0	0	-2	-3	-1	-2	-2	-1	-1	0
1993	155	1	2	3	2	5	3	-1	-2	-3	-1	-4	-2	2	2	1
1994	155	7	4	4	2	2	0	-1	0	-2	-2	-1	-3	2	2	1
1995	154	5	1	3	1	0	-1	-4	-1	-4	-3	-3	-4	2	2	0
1996	148	5	1	3	1	-1	-3	-2	-1	-3	-2	-2	-3	3	3	0
1997	155	6	1	2	1	-3	-5	-3	-2	-4	-2	-3	-4	3	2	-1
1998	155	6	2	1	-2	-1	-3	-3	-2	-5	-3	-3	-4	3	3	-1
1999	149	6	3	1	-1	-2	-3	-1	-3	-7	-3	-4	-4	2	2	-1
2000	151	7	2	1	-1	-3	-5	-2	-3	-4	-2	-3	-4	2	1	-1
2001	152	8	2	3	-1	-1	-2	1	-5	-5	-2	-4	-3	4	3	0
2002	157	8	3	2	-1	1	-1	0	-2	-5	-2	-3	-3	3	3	0
2003	163	7	2	1	-1	-3	-5	-3	-4	-6	-4	-4	-3	3	3	-1
2004	146	8	2	3	-1	-2	-3	-3	-2	-5	-3	-3	-2	4	4	0
2005	151	8	3	4	1	-2	-3	-2	-3	-6	-3	-3	-2	3	3	0
2006	145	8	3	2	0	-2	-3	-3	-3	-4	-3	-2	-2	3	2	0
2007	155	6	1	2	1	-3	-3	-2	0	-4	-2	-2	-4	3	3	0
2008	159	7	2	2	1	-3	-4	-3	-1	-3	-2	-1	-5	1	1	-1
AVERAGE		5	2	2	1	-1	-3	-2	-2	-4	-2	-2	-3	2	2	0

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23

Number of Games: 200

Average Over Low Water Years (Bottom 10 Percent)

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The Dalles Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	25	108	120	131	152	131	127	126	126	142	211	135	97	94	96	131
1990	27	110	121	130	150	142	129	133	137	148	212	144	97	92	100	134
1991	26	110	116	122	143	135	127	128	128	141	208	135	99	101	101	130
1992	18	115	121	125	148	139	123	129	136	143	209	135	100	103	104	132
1993	21	114	120	125	146	139	129	134	138	147	211	139	103	100	103	134
1994	30	105	114	122	143	134	126	128	132	146	211	136	103	103	102	130
1995	31	109	114	122	145	136	128	128	132	144	210	136	104	103	104	131
1996	29	105	115	123	146	136	129	133	141	147	212	139	102	105	103	133
1997	29	104	113	123	144	142	131	135	141	152	211	134	102	105	106	133
1998	23	106	110	120	140	136	130	132	141	147	207	133	100	106	101	130
1999	33	103	110	120	143	142	128	126	133	144	207	141	97	99	102	130
2000	27	101	108	121	144	140	129	131	142	145	210	148	98	103	105	131
2001	31	103	107	118	139	138	130	128	134	145	209	141	98	102	100	129
2002	25	103	112	124	147	143	132	130	141	150	212	149	99	105	104	133
2003	23	97	107	118	140	134	128	128	136	147	210	145	107	102	100	130
2004	24	100	108	115	141	138	130	132	138	147	211	147	107	100	100	131
2005	30	101	107	119	142	138	131	131	139	146	210	151	106	99	100	131
2006	32	97	107	119	143	139	132	132	138	144	212	147	105	96	100	131
2007	23	101	106	118	144	138	130	129	142	142	211	150	104	96	98	131
2008	26	93	103	117	141	138	134	128	131	143	207	147	103	100	98	129
AVERAGE		104	112	121	144	138	129	130	136	146	210	141	102	101	101	131

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23
Incr Study: GMXA1SAS : NTS : TE3AC : 2.5 MAF : SPILL AGREEMENT SIGNED Date: 26-JUN-89 19:00:23
Difference = (Incr Study) - (Base Study)
Number of Games: 200
Average Over Low Water Years (Bottom 10 Percent)

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Difference Of
The Dalles Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	25	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1990	27	0	6	6	5	7	10	9	3	3	0	5	1	1	0	4
1991	26	4	3	4	2	4	5	5	1	1	0	2	0	-1	-1	2
1992	18	3	3	4	3	8	10	5	3	3	0	2	0	0	0	3
1993	21	1	1	2	1	5	9	3	2	2	0	3	0	0	0	2
1994	30	8	5	4	2	9	6	2	2	2	0	2	1	-1	-1	3
1995	31	5	3	3	1	7	6	3	2	3	0	3	1	0	-1	3
1996	29	7	3	3	3	8	8	4	3	3	0	4	0	-1	0	4
1997	29	8	4	3	4	6	6	4	0	0	0	4	2	0	0	3
1998	23	7	4	3	0	5	6	3	2	1	0	4	1	1	1	3
1999	33	7	3	3	0	7	5	0	0	0	0	8	6	4	3	4
2000	27	9	4	3	0	8	7	1	0	0	0	8	6	2	2	4
2001	31	10	6	4	0	9	8	1	0	1	0	10	8	2	2	5
2002	25	10	4	3	0	9	10	0	-1	-1	0	7	4	0	1	4
2003	23	8	4	2	0	6	7	0	1	0	0	6	3	0	1	3
2004	24	9	3	3	0	9	10	1	2	1	0	7	4	0	1	4
2005	30	10	4	4	5	8	11	4	2	3	0	6	2	-1	-1	5
2006	32	9	4	4	4	5	8	3	3	2	0	5	3	-1	0	4
2007	23	9	4	3	4	6	9	4	3	2	0	6	2	-1	0	4
2008	26	8	3	3	4	5	5	2	2	1	0	2	1	-1	0	3
AVERAGE		7	4	3	2	7	7	3	2	1	0	5	2	0	0	3

The Dalles Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	22	110	142	165	188	217	210	234	231	296	379	459	243	157	134	230
1990	19	113	136	163	194	220	214	244	234	317	393	449	244	159	134	233
1991	20	116	134	156	186	217	213	233	226	286	376	465	246	161	138	229
1992	22	116	135	153	181	217	215	230	225	275	367	477	250	164	140	229
1993	24	118	127	152	191	222	217	248	243	323	397	444	238	156	131	232
1994	15	107	127	154	190	222	227	249	241	309	393	455	242	159	134	232
1995	15	108	125	151	182	222	224	236	232	275	378	479	247	163	139	230
1996	23	105	117	147	194	225	232	257	247	329	406	443	238	157	131	233
1997	16	106	124	150	184	223	226	239	234	292	391	468	244	161	136	230
1998	22	108	132	155	187	221	221	242	236	295	387	463	244	160	135	231
1999	18	103	133	155	180	218	216	228	226	256	368	487	251	165	141	228
2000	22	101	123	154	192	224	231	251	242	311	397	455	241	159	134	233
2001	17	103	121	151	189	222	225	247	238	307	399	458	241	159	134	231
2002	18	103	126	152	190	222	225	245	239	303	392	457	243	160	134	231
2003	14	96	129	153	187	219	221	234	231	280	384	473	247	163	138	229
2004	30	101	120	149	189	222	227	242	235	298	394	463	243	161	136	230
2005	19	100	121	148	190	224	229	246	237	307	398	457	242	160	135	231
2006	23	99	120	149	190	223	231	245	237	300	397	464	243	161	136	231
2007	22	100	117	149	192	224	232	249	240	311	399	454	241	160	134	232
2008	15	97	123	148	195	225	232	247	241	308	402	458	242	160	134	232
AVERAGE		106	127	153	189	221	223	242	236	300	390	461	243	160	135	231

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BPAHYSUM Summary

Base Study: AEXBAARO : NTS :1.0 MAF : ALT RESOURCE ORDER: EXISTING TI Date: 6-OCT-89 16:00:23
Incr Study: GMXA1SAS : NTS : TE3AC : 2.5 MAF : SPILL AGREEMENT SIGNED Date: 26-JUN-89 19:00:23
Difference = (Incr Study) - (Base Study)
Number of Games: 200
Average Over High Water Years (Top 10 Percent)

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Difference Of
The Dalles Discharge (kcfs)

YEAR	NUM	SEP	OCT	NOV	DEC	JAN	FEB	MAR	AP1	AP2	MAY	JUN	JUL	AG1	AG2	ANN AVG
1989	22	0	0	0	0	0	-6	2	0	0	1	1	0	2	1	0
1990	19	0	6	1	0	-4	-4	0	1	0	-1	1	0	0	0	0
1991	20	3	2	0	0	0	-6	-2	2	0	-3	-4	-5	-2	-1	-1
1992	22	2	1	3	1	1	-1	-6	-1	-2	-1	-4	-7	-1	-1	-1
1993	24	1	2	4	1	3	3	-4	-4	-4	-3	-6	-8	-1	-1	-1
1994	15	9	4	4	0	3	-2	-7	-3	-4	-7	-6	-10	-2	-1	-1
1995	15	8	5	3	2	0	-5	-9	-1	-2	-8	-10	-10	-3	-3	-2
1996	23	8	2	5	-2	-1	-7	-7	-2	-4	-8	-9	-9	-2	-1	-3
1997	16	9	4	5	2	1	-4	-5	-1	-3	-9	-9	-8	-3	-3	-2
1998	22	10	0	-2	-1	2	-1	-4	-2	-4	-8	-8	-8	-2	-2	-2
1999	18	9	-3	-2	-2	1	-1	-3	-1	-2	-7	-10	-6	-4	-4	-2
2000	22	11	2	0	-3	1	-3	-4	0	-2	-8	-7	-4	-1	-1	-1
2001	17	10	1	0	-2	2	-2	-4	-2	-2	-9	-8	-5	-1	-1	-2
2002	18	9	2	-3	-3	2	-1	-2	-1	-2	-8	-4	-5	-2	-2	-1
2003	14	8	-2	-3	-3	-1	-3	-3	0	-3	-9	-6	-5	-3	-3	-3
2004	30	10	2	0	-2	0	-5	-3	1	-3	-10	-5	-5	-2	-2	-2
2005	19	9	0	-1	-3	-1	-3	-4	0	-3	-9	-4	-4	-1	-1	-2
2006	23	9	2	-1	-2	1	-5	-3	0	-2	-9	-5	-4	-2	-2	-2
2007	22	9	2	-2	-2	1	-3	-3	-3	-4	-9	-10	-6	-4	-4	-2
2008	15	10	1	1	-3	1	-2	-3	-4	-4	-9	-7	-3	0	0	-2
AVERAGE		7	2	1	-1	1	-3	-4	-1	-3	-7	-6	-5	-2	-2	-2

MONTHLY OVERGEN SPILL (MW)
EXISTING TIE SIZE
NO-ACTION ALTERNATIVE

OP-YR	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	ANNUAL
1989	0.0	0.0	0.0	0.0	36.8	59.1	212.7	271.2	859.0	1623.6	664.6	0.0	310.6
1990	0.0	0.0	0.0	0.0	41.8	123.7	228.4	344.2	936.0	1340.5	845.2	5.0	322.1
1991	0.0	0.0	0.0	0.0	19.9	111.2	277.2	265.7	745.6	1457.2	617.9	0.0	291.2
1992	0.0	0.0	0.0	0.0	24.1	47.7	122.0	265.8	796.1	1357.1	696.2	0.0	275.8
1993	0.0	0.0	0.0	0.0	42.4	45.6	164.3	337.1	832.5	1595.8	673.9	0.0	307.6
1994	0.0	0.0	0.0	0.0	26.5	104.7	152.0	227.6	664.6	1031.4	581.5	0.0	232.4
1995	0.0	0.0	0.0	0.0	30.6	72.6	128.4	158.8	831.1	1205.2	558.2	0.0	248.7
1996	0.0	0.0	0.0	0.0	8.2	101.1	213.4	225.1	1089.4	1424.4	667.2	0.0	310.7
1997	0.0	0.0	0.0	0.6	18.3	85.0	108.1	154.0	790.1	1305.6	699.2	0.0	263.4
1998	0.0	0.0	0.0	0.0	35.2	65.8	146.5	238.1	1146.0	1688.6	923.0	0.0	353.6
1999	0.0	0.0	0.0	5.7	50.7	155.6	232.4	350.1	797.1	1252.1	1064.1	0.0	325.7
2000	0.0	0.0	0.0	0.3	65.0	135.4	186.4	377.0	753.9	1349.4	891.4	0.0	313.2
2001	0.0	0.0	0.0	0.0	43.5	105.7	158.8	286.6	707.6	1158.2	755.4	1.4	268.1
2002	0.0	0.0	0.0	0.0	34.1	60.9	139.7	264.1	658.3	1121.0	856.6	0.0	261.2
2003	0.0	0.0	0.0	0.5	38.9	196.3	293.0	431.2	1014.6	850.6	557.7	0.0	281.9
2004	0.0	0.0	0.0	4.6	29.7	121.7	242.5	289.9	914.1	1194.2	586.9	0.0	282.0
2005	0.0	0.0	0.0	0.0	4.6	133.7	212.0	376.9	840.6	981.3	714.8	0.0	272.0
2006	0.0	0.0	0.0	3.2	27.3	81.3	196.1	383.0	827.4	925.9	518.5	0.0	246.9
2007	0.0	0.0	0.0	0.0	7.8	19.1	117.6	191.6	577.4	663.6	458.6	0.0	169.6
2008	0.0	0.0	0.0	0.0	7.6	32.9	63.4	211.6	308.1	560.4	643.3	0.0	152.3
AVG FOR ALL YEARS	0.0	0.0	0.0	0.7	29.6	93.0	179.7	282.5	804.5	1204.3	698.7	0.3	274.4

INCREMENTAL MONTHLY OVERGEN SPILL (MW)
CUMULATIVE IMPACTS STUDY
(MAXIMUM TIE SIZE, ALTERNATE RESOURCE ORDER) - (EXISTING TIE SIZE, ALTERNATE RESOURCE ORDER)

OP-YR	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	ANNUAL
1989	0.0	0.0	0.0	0.0	0.0	-43.5	-101.3	4.4	-312.3	-402.7	-316.2	0.0	-97.6
1990	0.0	0.0	0.0	0.0	-17.5	-67.8	16.1	-10.3	-355.0	-371.5	-374.5	-5.0	-98.8
1991	0.0	0.0	0.0	0.0	-6.5	-44.3	-149.4	-137.2	-331.2	-415.3	-276.5	0.0	-113.4
1992	0.0	0.0	0.0	0.0	-17.1	-16.5	-49.6	-147.0	-342.4	-423.6	-328.7	0.0	-110.4
1993	0.0	0.0	0.0	0.0	-42.4	-45.6	-148.0	-299.9	-496.7	-885.3	-543.6	0.0	-205.1
1994	0.0	0.0	0.0	0.0	-26.5	-99.3	-125.3	-200.6	-428.8	-625.6	-499.9	0.0	-167.2
1995	0.0	0.0	0.0	0.0	-30.6	-71.8	-128.4	-117.4	-709.9	-677.9	-421.8	0.0	-179.8
1996	0.0	0.0	0.0	0.0	-8.2	-95.9	-213.1	-224.9	-828.6	-987.5	-610.0	0.0	-247.4
1997	0.0	0.0	0.0	-0.6	-18.3	-79.5	-108.1	-147.8	-652.8	-970.3	-622.9	0.0	-216.7
1998	0.0	0.0	0.0	0.0	-35.2	-64.7	-146.5	-234.1	-923.7	-1126.3	-812.5	0.0	-278.6
1999	0.0	0.0	0.0	-5.7	-50.7	-153.4	-225.2	-326.5	-716.4	-996.0	-913.8	0.0	-282.3
2000	0.0	0.0	0.0	-0.3	-65.0	-128.2	-181.6	-348.0	-664.5	-1026.5	-775.0	0.0	-265.8
2001	0.0	0.0	0.0	0.0	-43.5	-103.1	-158.8	-253.8	-625.4	-889.8	-631.0	-1.4	-225.6
2002	0.0	0.0	0.0	0.0	-34.1	-60.9	-135.1	-250.0	-545.7	-839.0	-746.3	0.0	-217.6
2003	0.0	0.0	0.0	-0.5	-38.8	-190.0	-265.9	-377.4	-875.2	-690.4	-513.8	0.0	-246.0
2004	0.0	0.0	0.0	-4.6	-28.8	-119.8	-235.1	-270.2	-789.5	-970.7	-554.2	0.0	-247.7
2005	0.0	0.0	0.0	0.0	-4.6	-133.7	-210.7	-342.2	-679.8	-778.0	-691.5	0.0	-236.7
2006	0.0	0.0	0.0	-3.2	-27.3	-81.3	-196.0	-354.2	-692.3	-754.2	-479.3	0.0	-215.7
2007	0.0	0.0	0.0	0.0	-7.8	-19.1	-117.6	-186.2	-522.2	-583.0	-431.7	0.0	-155.6
2008	0.0	0.0	0.0	0.0	-7.6	-32.9	-63.4	-203.0	-296.5	-519.8	-590.0	0.0	-142.8
AVG FOR ALL YEARS	0.0	0.0	0.0	-0.7	-25.5	-82.6	-147.2	-221.3	-589.4	-746.7	-556.7	-0.3	-197.5

INCREMENTAL MONTHLY OVERGEN SPILL (MW)
CUMULATIVE IMPACTS STUDY
(MAXIMUM TIE SIZE, SPILL AGREEMENT SIGNED) - (EXISTING TIE SIZE, ALTERNATE RESOURCE ORDER)

OP-YR	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	ANNUAL
1989	0.0	0.0	0.0	0.0	-0.1	-43.6	-101.6	2.0	-331.7	-461.7	-307.3	0.0	-103.7
1990	0.0	0.0	0.0	0.0	-19.8	-76.1	24.8	-21.5	-387.6	-420.1	-358.1	-5.0	-105.3
1991	0.0	0.0	0.0	0.0	-6.5	-59.5	-149.4	-138.3	-364.4	-516.4	-332.3	0.0	-130.6
1992	0.0	0.0	0.0	0.0	-18.7	-25.9	-76.0	-176.5	-449.3	-559.2	-373.2	0.0	-139.9
1993	0.0	0.0	0.0	0.0	-42.4	-45.6	-157.0	-303.5	-536.6	-924.4	-574.8	0.0	-215.4
1994	0.0	0.0	0.0	0.0	-26.5	-104.7	-150.6	-211.8	-479.6	-666.3	-544.3	0.0	-182.0
1995	0.0	0.0	0.0	0.0	-30.6	-72.6	-128.4	-120.2	-762.1	-766.6	-503.1	0.0	-198.6
1996	0.0	0.0	0.0	0.0	-8.2	-101.1	-213.4	-225.1	-880.6	-1042.9	-637.1	0.0	-259.0
1997	0.0	0.0	0.0	-0.6	-18.3	-83.3	-108.1	-153.2	-698.6	-1037.8	-662.2	0.0	-230.2
1998	0.0	0.0	0.0	0.0	-35.2	-65.8	-146.5	-233.4	-996.9	-1227.8	-863.9	0.0	-297.5
1999	0.0	0.0	0.0	-5.7	-50.7	-155.2	-224.6	-326.4	-733.1	-1033.7	-974.2	0.0	-292.0
2000	0.0	0.0	0.0	-0.3	-65.0	-128.3	-179.2	-354.8	-680.6	-1077.1	-837.8	0.0	-276.9
2001	0.0	0.0	0.0	0.0	-43.5	-103.1	-158.8	-262.2	-643.5	-922.2	-703.1	-1.4	-236.5
2002	0.0	0.0	0.0	0.0	-34.1	-60.9	-136.5	-249.3	-571.6	-893.1	-807.4	0.0	-229.4
2003	0.0	0.0	0.0	-0.5	-38.9	-193.3	-277.1	-387.7	-914.2	-723.4	-537.9	0.0	-256.1
2004	0.0	0.0	0.0	-4.6	-28.8	-117.7	-241.8	-276.8	-813.2	-1021.3	-556.1	0.0	-255.0
2005	0.0	0.0	0.0	0.0	-4.6	-133.7	-212.0	-360.1	-717.0	-830.1	-706.6	0.0	-247.0
2006	0.0	0.0	0.0	-3.2	-27.3	-81.3	-192.5	-374.3	-721.0	-793.0	-509.1	0.0	-225.1
2007	0.0	0.0	0.0	0.0	-7.8	-19.1	-117.6	-187.6	-537.3	-596.8	-453.5	0.0	-160.0
2008	0.0	0.0	0.0	0.0	-7.6	-32.9	-63.4	-207.6	-297.9	-529.2	-608.2	0.0	-145.6
AVG FOR ALL YEARS	0.0	0.0	0.0	-0.7	-25.7	-85.2	-150.5	-228.4	-625.8	-802.2	-592.5	-0.3	-209.3

RELATIVE CHANGES IN SYSTEM STOCK SURVIVAL
AMXBAARO VS AEXBAARO (BASE CASE)

PROGRAM = DSN=PJI.PF400.RNR.FISHPASS.SAS.REPORTS(FSUM56)
FILES: PJI.PF400.RNR.FISH.PASS.DATA.MIDCOLFG — RUN DATE: OCT/17/89
PJI.PF400.RNR.FISH.PASS.DATA.MIDCOLFG — RUN DATE: AUG/04/89

		YEARLING			SUBYEARLING			STEELHEAD			SOCKEYE		
POOL	YEAR	MB	MA	RM	MB	MA	RM	MB	MA	RM	MB	MA	RM
WELLS	1991	31.5	30.9	-1.8	19.1	18.9	-1.2	36.0	35.5	-1.5	26.8	26.2	-2.2
	1993	34.5	34.1	-1.2	21.0	20.4	-2.7	39.7	39.3	-1.0	28.2	27.7	-1.7
	1995	40.8	40.3	-1.0	29.7	29.3	-1.4	47.3	47.0	-0.6	34.9	34.4	-1.4
	1997	42.0	41.6	-0.9	30.0	29.2	-2.9	48.1	47.8	-0.6	34.8	34.3	-1.6
	2001	41.1	40.7	-1.1	29.5	28.7	-2.6	47.6	47.2	-0.9	34.7	34.1	-1.7
	2005	41.4	41.0	-1.0	28.5	27.8	-2.4	47.9	47.5	-0.8	35.0	34.4	-1.7
RRECH	1991	33.5	33.1	-1.2	24.6	24.3	-1.4	38.1	37.6	-1.4	0.0	0.0	0.0
	1993	37.2	36.9	-0.8	26.5	25.8	-2.7	41.6	41.3	-0.7	0.0	0.0	0.0
	1995	45.3	45.1	-0.4	35.2	34.8	-1.1	49.8	49.6	-0.4	0.0	0.0	0.0
	1997	46.9	46.8	-0.2	34.9	33.9	-2.8	50.4	50.2	-0.4	0.0	0.0	0.0
	2001	45.5	45.3	-0.4	34.6	34.0	-1.8	50.0	49.7	-0.5	0.0	0.0	0.0
	2005	46.2	45.9	-0.6	34.7	34.2	-1.3	50.2	49.9	-0.6	0.0	0.0	0.0
RISL	1991	40.9	40.5	-0.8	26.5	26.4	-0.7	42.3	42.1	-0.5	34.5	34.1	-1.2
	1993	41.1	40.9	-0.5	27.1	26.6	-2.0	43.0	42.6	-0.9	34.4	34.0	-1.1
	1995	49.9	49.6	-0.5	37.5	37.3	-0.7	53.5	53.4	-0.2	42.8	42.5	-0.8
	1997	51.6	51.5	-0.2	37.8	37.1	-1.8	54.0	53.9	-0.2	42.9	42.5	-0.8
	2001	49.9	49.7	-0.3	37.4	36.8	-1.6	52.9	52.8	-0.3	42.5	42.1	-1.1
	2005	50.3	50.2	-0.1	36.5	36.1	-1.2	53.9	53.7	-0.3	43.1	42.6	-1.1
LNG	1991	83.0	83.0	-0.1	59.9	59.8	-0.1	85.7	85.7	-0.0	65.6	65.5	-0.2
	1993	82.2	82.2	-0.0	60.3	60.1	-0.2	85.6	85.6	-0.0	65.4	65.3	-0.2
	1995	88.1	88.1	-0.0	70.2	70.2	-0.1	89.4	89.4	-0.0	74.6	74.5	-0.1
	1997	88.5	88.5	-0.0	70.5	70.4	-0.2	89.5	89.5	-0.0	74.5	74.4	-0.1
	2001	88.3	88.3	-0.0	70.9	70.8	-0.1	89.7	89.7	-0.0	74.9	74.8	-0.1
	2005	87.7	87.7	-0.0	70.2	70.1	-0.1	89.3	89.3	0.0	74.4	74.3	-0.1
LWM	1991	33.9	33.3	-1.6	27.5	27.2	-1.3	40.8	40.2	-1.3	0.0	0.0	0.0
	1993	36.1	35.8	-0.8	28.6	27.5	-3.7	44.3	44.1	-0.5	0.0	0.0	0.0
	1995	38.3	38.0	-0.8	34.4	33.7	-2.3	46.7	46.5	-0.5	0.0	0.0	0.0
	1997	38.8	38.5	-0.7	36.3	34.5	-5.0	47.0	46.8	-0.4	0.0	0.0	0.0
	2001	38.6	38.3	-0.8	35.6	34.6	-2.7	47.3	47.1	-0.5	0.0	0.0	0.0
	2005	38.9	38.7	-0.4	33.4	32.7	-2.2	47.9	47.8	-0.3	0.0	0.0	0.0
MCN	1991	59.7	59.7	-0.1	42.9	42.7	-0.3	67.5	67.5	-0.1	0.0	0.0	0.0
	1993	58.8	58.8	-0.0	42.9	42.4	-1.1	66.6	66.5	-0.2	0.0	0.0	0.0
	1995	64.8	64.7	-0.2	53.5	53.2	-0.6	73.1	73.0	-0.1	0.0	0.0	0.0
	1997	66.6	66.6	-0.1	53.8	53.2	-1.3	74.2	74.1	-0.2	0.0	0.0	0.0
	2001	64.3	64.6	0.5	53.6	53.1	-0.9	72.9	72.8	-0.2	0.0	0.0	0.0
	2005	64.5	64.6	0.2	52.7	52.3	-0.8	73.2	73.1	-0.1	0.0	0.0	0.0
JDAY	1991	54.9	54.8	-0.1	45.6	45.1	-1.1	60.5	60.2	-0.5	0.0	0.0	0.0
	1993	55.1	54.6	-0.9	45.4	44.4	-2.2	60.0	59.5	-0.8	0.0	0.0	0.0
	1995	54.1	54.0	-0.3	47.1	46.2	-1.8	60.2	59.6	-0.9	0.0	0.0	0.0
	1997	56.3	56.0	-0.4	46.5	44.8	-3.7	62.3	61.8	-0.8	0.0	0.0	0.0
	2001	55.9	55.7	-0.4	46.6	45.6	-2.1	62.2	61.8	-0.6	0.0	0.0	0.0
	2005	57.0	56.6	-0.7	45.6	44.8	-1.8	62.3	61.9	-0.5	0.0	0.0	0.0
DALS	1991	66.1	66.0	-0.1	55.2	55.0	-0.3	66.1	65.9	-0.3	0.0	0.0	0.0
	1993	66.6	66.0	-0.8	55.3	54.7	-1.1	66.4	65.9	-0.9	0.0	0.0	0.0
	1995	66.1	65.9	-0.3	56.0	55.5	-0.8	66.5	66.1	-0.5	0.0	0.0	0.0
	1997	69.6	69.4	-0.3	57.3	56.3	-1.8	69.2	68.9	-0.5	0.0	0.0	0.0
	2001	68.9	68.8	-0.1	56.9	56.1	-1.4	69.3	69.1	-0.4	0.0	0.0	0.0
	2005	69.4	69.1	-0.4	55.6	54.8	-1.3	69.3	69.0	-0.4	0.0	0.0	0.0
BONN	1991	87.5	87.5	-0.0	79.7	79.5	-0.1	83.4	83.4	0.0	0.0	0.0	0.0
	1993	87.5	87.5	-0.1	79.8	79.5	-0.3	83.3	83.2	-0.1	0.0	0.0	0.0
	1995	87.2	87.1	-0.1	79.8	79.6	-0.2	82.9	82.9	-0.1	0.0	0.0	0.0
	1997	87.3	87.2	-0.1	78.7	78.4	-0.3	82.3	82.2	-0.1	0.0	0.0	0.0
	2001	87.0	87.0	-0.0	78.4	78.1	-0.4	82.0	82.0	-0.1	0.0	0.0	0.0
	2005	87.2	87.1	-0.2	78.7	78.2	-0.6	82.6	82.5	-0.2	0.0	0.0	0.0
SYS	1991	69.9	69.7	-0.2	52.5	52.3	-0.3	72.9	72.7	-0.2	50.9	50.6	-0.5
	1993	70.1	70.0	-0.2	52.7	52.3	-0.8	73.1	72.9	-0.2	51.2	50.9	-0.5
	1995	73.8	73.6	-0.2	58.9	58.5	-0.5	76.8	76.7	-0.2	59.6	59.4	-0.4
	1997	74.6	74.5	-0.1	58.7	58.0	-1.1	77.3	77.2	-0.2	59.5	59.3	-0.4
	2001	73.9	73.8	-0.1	58.4	57.9	-0.8	77.2	77.1	-0.2	59.7	59.4	-0.5
	2005	74.0	73.9	-0.2	57.9	57.4	-0.8	77.2	77.1	-0.1	59.5	59.3	-0.4

LEGEND
MB = MEAN SURVIVAL WITH BASE CASE CONDITIONS (%) (BASE CASE)
MA = MEAN SURVIVAL WITH ALTERNATIVE CONDITIONS (%) (ALTERNATIVE)
RM = RELATIVE CHANGE IN MEAN SURVIVAL (%)
(ALTERNATIVE SURVIVAL - BASE CASE SURVIVAL) / (BASE CASE SURVIVAL)

DATE RUN= 30JAN90:07:54:00

FREQUENCY OF RELATIVE SURVIVAL CHANGES
EXCEEDING ONE AND FIVE PERCENT

PROGRAM = DSN=PJI.PF400.RNR.SAS.REPORTS(FSUM)
FILE: PJI.PF400.RNR.FISH.PASS.DATA.MIDCOLFG
FILE: PJI.PF400.RNR.FISH.PASS.DATA.MIDCOLFG

	YEARLING				SUBYEARLING				STEELHEAD				SOCKEYE			
POOL	FI1	FI5	FD1	FD5	FI1	FI5	FD1	FD5	FI1	FI5	FD1	FD5	FI1	FI5	FD1	FD5
WELLS	3/	0	45/	13	8/	0	33/	8	0/	0	48/	3	0/	0	48/	15
	0/	0	35/	3	8/	0	43/	23	0/	0	35/	0	0/	0	53/	5
	0/	0	25/	10	5/	0	35/	5	0/	0	28/	0	0/	0	33/	13
	3/	0	20/	5	0/	0	50/	25	0/	0	23/	0	0/	0	45/	10
	3/	0	28/	5	0/	0	53/	18	0/	0	33/	3	0/	0	40/	13
	3/	0	30/	5	0/	0	40/	18	0/	0	33/	0	0/	0	43/	13
RRECH	5/	0	45/	5	8/	0	45/	5	0/	0	40/	5	0/	0	0/	0
	5/	0	28/	3	5/	0	53/	20	0/	0	25/	0	0/	0	0/	0
	3/	0	23/	0	0/	0	25/	3	0/	0	18/	0	0/	0	0/	0
	3/	3	15/	0	0/	0	58/	25	0/	0	20/	0	0/	0	0/	0
	3/	3	25/	3	0/	0	43/	13	0/	0	25/	0	0/	0	0/	0
	8/	3	35/	8	3/	0	35/	3	0/	0	25/	0	0/	0	0/	0
RISL	0/	0	40/	0	5/	0	28/	0	8/	0	18/	0	0/	0	45/	3
	5/	0	38/	0	3/	0	50/	10	0/	0	25/	3	0/	0	45/	0
	0/	0	28/	0	3/	0	28/	0	3/	0	3/	0	0/	0	25/	0
	3/	3	18/	0	0/	0	50/	0	0/	0	3/	0	0/	0	25/	3
	3/	3	23/	0	0/	0	50/	3	3/	0	15/	0	0/	0	30/	3
	5/	3	28/	0	0/	0	40/	0	0/	0	13/	0	0/	0	43/	0
LNG	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0
	0/	0	0/	0	0/	0	3/	0	0/	0	0/	0	0/	0	0/	0
	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0
	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0
	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0
	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0	0/	0
LWM	0/	0	45/	5	5/	0	25/	8	0/	0	43/	0	0/	0	0/	0
	0/	0	25/	0	5/	0	45/	23	0/	0	13/	0	0/	0	0/	0
	0/	0	25/	0	0/	0	25/	23	0/	0	25/	0	0/	0	0/	0
	3/	0	23/	0	0/	0	58/	38	0/	0	18/	0	0/	0	0/	0
	5/	0	28/	0	0/	0	38/	18	3/	0	23/	0	0/	0	0/	0
	10/	3	23/	0	0/	0	35/	10	10/	0	18/	0	0/	0	0/	0
MCN	8/	0	8/	0	5/	0	20/	0	5/	0	3/	0	0/	0	0/	0
	5/	5	18/	0	0/	0	38/	0	3/	0	3/	0	0/	0	0/	0
	3/	3	18/	0	0/	0	28/	0	0/	0	0/	0	0/	0	0/	0
	5/	0	10/	0	0/	0	53/	0	0/	0	3/	0	0/	0	0/	0
	8/	8	13/	0	0/	0	33/	0	3/	0	5/	0	0/	0	0/	0
	10/	3	20/	0	3/	0	35/	0	8/	0	5/	0	0/	0	0/	0
JDAY	15/	3	13/	3	8/	0	33/	5	3/	0	23/	0	0/	0	0/	0
	3/	0	25/	0	5/	0	60/	18	0/	0	35/	0	0/	0	0/	0
	5/	0	20/	0	0/	0	48/	10	0/	0	43/	0	0/	0	0/	0
	0/	0	5/	0	0/	0	60/	38	0/	0	48/	0	0/	0	0/	0
	3/	3	18/	0	0/	0	55/	10	0/	0	28/	0	0/	0	0/	0
	8/	0	20/	5	3/	0	58/	5	0/	0	23/	0	0/	0	0/	0
DALS	8/	3	15/	3	5/	0	15/	0	3/	0	15/	0	0/	0	0/	0
	0/	0	25/	0	0/	0	35/	0	0/	0	30/	0	0/	0	0/	0
	8/	0	10/	0	0/	0	33/	0	0/	0	23/	0	0/	0	0/	0
	0/	0	8/	0	0/	0	58/	0	0/	0	5/	0	0/	0	0/	0
	3/	3	18/	0	0/	0	45/	0	3/	0	13/	0	0/	0	0/	0
	8/	0	18/	0	0/	0	40/	0	0/	0	23/	0	0/	0	0/	0
BONN	3/	0	3/	0	3/	0	15/	0	3/	0	3/	0	0/	0	0/	0
	0/	0	0/	0	0/	0	18/	0	0/	0	0/	0	0/	0	0/	0
	0/	0	3/	0	0/	0	5/	0	0/	0	0/	0	0/	0	0/	0
	0/	0	0/	0	0/	0	5/	0	0/	0	3/	0	0/	0	0/	0
	5/	0	0/	0	3/	0	20/	0	3/	0	3/	0	0/	0	0/	0
	0/	0	3/	0	3/	0	15/	0	0/	0	5/	0	0/	0	0/	0
SYS	0/	0	3/	0	0/	0	18/	0	0/	0	0/	0	0/	0	25/	0
	0/	0	0/	0	0/	0	30/	0	0/	0	0/	0	0/	0	25/	0
	0/	0	3/	0	0/	0	20/	0	0/	0	0/	0	0/	0	15/	0
	0/	0	0/	0	0/	0	48/	0	0/	0	0/	0	0/	0	15/	0
	5/	0	3/	0	0/	0	35/	0	0/	0	3/	0	0/	0	18/	0
	3/	0	3/	0	0/	0	35/	0	0/	0	0/	0	0/	0	18/	0

LEGEND
FI1 = PERCENT OF RELATIVE SURVIVAL INCREASES EXCEEDING ONE PERCENT
FI5 = PERCENT OF RELATIVE SURVIVAL INCREASES EXCEEDING FIVE PERCENT
FD1 = PERCENT OF RELATIVE SURVIVAL DECREASES EXCEEDING ONE PERCENT
FD5 = PERCENT OF RELATIVE SURVIVAL DECREASES EXCEEDING FIVE PERCENT

DATE RUN= 30JAN90:08:06:19

RELATIVE CHANGES IN SYSTEM STOCK SURVIVAL
GMXA1SAS VS AEXBAARO (BASE CASE)

PROGRAM = DSN=PJI.PF400.RNR.FISHPASS.SAS.REPORTS(FSUM56)
FILES: PJI.PF400.RNR.FISH.PASS.DATA.MIDCOLFG RUN DATE: OCT/17/89
PJI.PF400.RNR.FISH.PASS.DATA.MIDCOLFG RUN DATE: AUG/03/89

		YEARLING			SUBYEARLING			STEELHEAD			SOCKEYE		
POOL	YEAR	MB	MA	RM	MB	MA	RM	MB	MA	RM	MB	MA	RM
WELLS	1991	31.5	31.4	-0.1	19.1	18.9	-1.2	36.0	36.0	-0.2	26.8	26.5	-0.9
	1993	34.5	34.8	0.6	21.0	20.4	-2.5	39.7	39.9	0.5	28.2	28.1	-0.3
	1995	40.8	41.3	1.2	29.7	29.4	-1.1	47.3	47.8	1.1	34.9	34.9	0.1
	1997	42.0	42.6	1.5	30.0	29.2	-2.7	48.1	48.6	0.9	34.8	34.7	-0.4
	2001	41.1	41.5	0.8	29.5	29.2	-0.9	47.6	47.9	0.6	34.7	34.6	-0.2
	2005	41.4	41.7	0.6	28.5	28.2	-0.9	47.9	48.2	0.6	35.0	34.8	-0.5
RRECH	1991	33.5	33.2	-1.0	24.6	24.2	-1.6	38.1	37.7	-1.3	0.0	0.0	0.0
	1993	37.2	37.1	-0.3	26.5	25.8	-2.6	41.6	41.5	-0.4	0.0	0.0	0.0
	1995	45.3	45.8	0.9	35.2	34.8	-1.1	49.8	49.7	-0.2	0.0	0.0	0.0
	1997	46.9	47.3	0.9	34.9	34.0	-2.6	50.4	50.3	-0.3	0.0	0.0	0.0
	2001	45.5	45.7	0.3	34.6	34.5	-0.5	50.0	49.8	-0.2	0.0	0.0	0.0
	2005	46.2	46.3	0.1	34.7	34.5	-0.5	50.2	50.0	-0.4	0.0	0.0	0.0
RISL	1991	40.9	40.7	-0.4	26.5	26.3	-1.1	42.3	42.2	-0.4	34.5	34.2	-0.8
	1993	41.1	41.1	0.1	27.1	26.5	-2.2	43.0	42.6	-1.0	34.4	34.1	-0.8
	1995	49.9	50.2	0.7	37.5	37.2	-0.9	53.5	53.5	0.1	42.8	42.6	-0.5
	1997	51.6	52.2	1.0	37.8	37.0	-2.0	54.0	54.0	0.0	42.9	42.6	-0.6
	2001	49.9	50.0	0.3	37.4	37.1	-0.7	52.9	52.9	-0.1	42.5	42.2	-0.8
	2005	50.3	50.6	0.6	36.5	36.3	-0.6	53.9	53.8	-0.1	43.1	42.7	-0.9
LWG	1991	83.0	83.0	0.0	59.9	59.9	0.0	85.7	85.7	0.0	65.6	65.6	0.1
	1993	82.2	82.2	-0.0	60.3	60.1	-0.3	85.6	85.6	-0.0	65.4	65.3	-0.2
	1995	88.1	88.1	0.0	70.2	70.1	-0.1	89.4	89.4	0.0	74.6	74.5	-0.1
	1997	88.5	88.5	-0.0	70.5	70.4	-0.2	89.5	89.5	-0.0	74.5	74.4	-0.1
	2001	88.3	88.3	-0.0	70.9	70.7	-0.2	89.7	89.7	0.0	74.9	74.8	-0.1
	2005	87.7	87.7	-0.0	70.2	70.1	-0.1	89.3	89.3	0.0	74.4	74.3	-0.1
LWM	1991	33.9	34.7	2.4	27.5	28.1	2.2	40.8	41.9	2.7	0.0	0.0	0.0
	1993	36.1	36.0	-0.2	28.6	27.4	-4.2	44.3	44.3	0.0	0.0	0.0	0.0
	1995	38.3	38.4	0.2	34.4	33.5	-2.6	46.7	46.8	0.3	0.0	0.0	0.0
	1997	38.8	39.0	0.5	36.3	34.2	-5.8	47.0	47.1	0.2	0.0	0.0	0.0
	2001	38.6	38.6	-0.0	35.6	34.7	-2.3	47.3	47.3	0.0	0.0	0.0	0.0
	2005	38.9	39.0	0.3	33.4	32.7	-2.3	47.9	48.1	0.3	0.0	0.0	0.0
MCN	1991	59.7	60.0	0.5	42.9	42.6	-0.6	67.5	67.6	0.1	0.0	0.0	0.0
	1993	58.8	59.0	0.4	42.9	42.4	-1.2	66.6	66.7	0.1	0.0	0.0	0.0
	1995	64.8	64.8	-0.0	53.5	53.3	-0.5	73.1	73.2	0.2	0.0	0.0	0.0
	1997	66.6	67.2	0.9	53.8	53.3	-1.0	74.2	74.5	0.3	0.0	0.0	0.0
	2001	64.3	65.0	1.1	53.6	53.4	-0.4	72.9	73.0	0.2	0.0	0.0	0.0
	2005	64.5	65.3	1.3	52.7	52.6	-0.2	73.2	73.3	0.2	0.0	0.0	0.0
JDAY	1991	54.9	54.8	-0.0	45.6	45.4	-0.5	60.5	61.0	0.7	0.0	0.0	0.0
	1993	55.1	54.6	-0.9	45.4	44.6	-1.6	60.0	60.2	0.4	0.0	0.0	0.0
	1995	54.1	54.1	-0.2	47.1	46.5	-1.2	60.2	60.5	0.6	0.0	0.0	0.0
	1997	56.3	56.0	-0.4	46.5	44.8	-3.6	62.3	61.9	-0.7	0.0	0.0	0.0
	2001	55.9	55.6	-0.6	46.6	46.2	-0.9	62.2	62.1	-0.1	0.0	0.0	0.0
	2005	57.0	56.4	-1.0	45.6	45.2	-0.9	62.3	62.3	-0.0	0.0	0.0	0.0
DALS	1991	66.1	66.1	-0.0	55.2	55.4	0.4	66.1	66.3	0.4	0.0	0.0	0.0
	1993	66.6	66.1	-0.7	55.3	55.2	-0.1	66.4	66.2	-0.3	0.0	0.0	0.0
	1995	66.1	66.2	0.1	56.0	55.9	-0.1	66.5	66.6	0.2	0.0	0.0	0.0
	1997	69.6	69.3	-0.3	57.3	56.0	-2.4	69.2	68.8	-0.6	0.0	0.0	0.0
	2001	68.9	68.8	-0.2	56.9	56.1	-1.3	69.3	69.0	-0.5	0.0	0.0	0.0
	2005	69.4	69.1	-0.4	55.6	54.9	-1.3	69.3	68.9	-0.5	0.0	0.0	0.0
BONN	1991	87.5	87.5	-0.0	79.7	79.5	-0.2	83.4	83.4	0.1	0.0	0.0	0.0
	1993	87.5	87.5	-0.0	79.8	79.5	-0.4	83.3	83.2	-0.1	0.0	0.0	0.0
	1995	87.2	87.2	-0.0	79.8	79.6	-0.2	82.9	82.9	0.0	0.0	0.0	0.0
	1997	87.3	87.2	-0.1	78.7	78.4	-0.3	82.3	82.2	-0.1	0.0	0.0	0.0
	2001	87.0	87.0	0.0	78.4	78.0	-0.4	82.0	81.9	-0.1	0.0	0.0	0.0
	2005	87.2	87.2	-0.1	78.7	78.2	-0.6	82.6	82.5	-0.2	0.0	0.0	0.0
SYS	1991	69.9	69.8	-0.0	52.5	52.3	-0.3	72.9	72.9	0.1	50.9	50.8	-0.2
	1993	70.1	70.1	-0.0	52.7	52.3	-0.9	73.1	73.1	0.0	51.2	51.0	-0.3
	1995	73.8	73.9	0.1	58.9	58.6	-0.5	76.8	76.9	0.1	59.6	59.5	-0.1
	1997	74.6	74.7	0.2	58.7	58.1	-1.0	77.3	77.3	-0.0	59.5	59.4	-0.2
	2001	73.9	74.0	0.1	58.4	58.1	-0.5	77.2	77.2	-0.0	59.7	59.6	-0.2
	2005	74.0	74.1	0.1	57.9	57.6	-0.5	77.2	77.2	0.0	59.5	59.4	-0.2

LEGEND
MB = MEAN SURVIVAL WITH BASE CASE CONDITIONS (%) (BASE CASE)
MA = MEAN SURVIVAL WITH ALTERNATIVE CONDITIONS (%) (ALTERNATIVE)
RM = RELATIVE CHANGE IN MEAN SURVIVAL (%)
(ALTERNATIVE SURVIVAL - BASE CASE SURVIVAL) / (BASE CASE SURVIVAL)

DATE RUN= 07DEC89:09:26:29

FREQUENCY OF RELATIVE SURVIVAL CHANGES
EXCEEDING ONE AND FIVE PERCENT

PROGRAM = DSN=PJI.PF400.RNR.SAS.REPORTS(FSUM1)
FILE: PJI.PF400.RNR.FISH.PASS.DATA.MIDCOLFG
FILE: PJI.PF400.RNR.FISH.PASS.DATA.MIDCOLFG

	YEARLING		SUBYEARLING		STEELHEAD		SOCKEYE	
POOL	FI1/FI5	FD1/FD5	FI1/FI5	FD1/FD5	FI1/FI5	FD1/FD5	FI1/FI5	FD1/FD5
WELLS	53/ 0	38/ 10	40/ 0	40/ 10	50/ 0	40/ 0	45/ 0	40/ 10
	58/ 0	28/ 0	53/ 5	43/ 23	48/ 0	20/ 0	38/ 0	38/ 0
	65/ 5	23/ 0	38/ 5	43/ 8	65/ 0	3/ 0	48/ 0	25/ 3
	75/ 8	15/ 3	30/ 8	63/ 25	63/ 0	3/ 0	25/ 0	18/ 5
	65/ 0	23/ 0	30/ 20	48/ 10	58/ 0	10/ 0	33/ 0	33/ 5
	53/ 0	18/ 0	48/ 10	40/ 20	50/ 0	13/ 0	38/ 0	38/ 5
RRECH	8/ 0	48/ 3	25/ 0	43/ 15	3/ 0	40/ 5	0/ 0	0/ 0
	13/ 5	28/ 5	10/ 0	50/ 20	3/ 0	18/ 0	0/ 0	0/ 0
	30/ 10	18/ 0	13/ 3	40/ 0	3/ 0	15/ 0	0/ 0	0/ 0
	33/ 3	10/ 0	5/ 5	65/ 25	3/ 0	20/ 0	0/ 0	0/ 0
	18/ 5	23/ 0	15/ 15	43/ 10	3/ 0	15/ 0	0/ 0	0/ 0
	28/ 5	25/ 5	18/ 13	45/ 5	5/ 0	23/ 0	0/ 0	0/ 0
RISL	10/ 0	33/ 0	18/ 3	38/ 3	13/ 0	20/ 0	18/ 0	43/ 3
	10/ 5	35/ 0	25/ 0	48/ 18	5/ 0	33/ 5	8/ 0	43/ 0
	20/ 8	20/ 0	18/ 0	43/ 0	15/ 0	13/ 0	13/ 0	38/ 0
	30/ 8	5/ 0	15/ 5	65/ 15	13/ 0	10/ 0	13/ 0	30/ 3
	15/ 3	15/ 0	25/ 15	58/ 3	5/ 0	15/ 0	5/ 0	35/ 0
	28/ 8	18/ 0	33/ 10	48/ 3	18/ 0	25/ 0	10/ 0	43/ 0
LWG	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
	0/ 0	0/ 0	0/ 0	8/ 0	0/ 0	0/ 0	0/ 0	0/ 0
	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
LWM	58/ 45	18/ 0	78/ 50	18/ 8	75/ 45	5/ 0	0/ 0	0/ 0
	13/ 0	20/ 0	13/ 0	50/ 23	10/ 0	5/ 0	0/ 0	0/ 0
	23/ 0	18/ 0	15/ 0	38/ 23	13/ 0	5/ 0	0/ 0	0/ 0
	23/ 5	20/ 0	5/ 0	68/ 40	10/ 0	3/ 0	0/ 0	0/ 0
	15/ 0	18/ 0	20/ 0	45/ 13	5/ 0	5/ 0	0/ 0	0/ 0
	23/ 3	13/ 0	23/ 0	50/ 15	20/ 0	8/ 0	0/ 0	0/ 0
MCN	20/ 5	8/ 0	8/ 0	30/ 0	10/ 0	3/ 0	0/ 0	0/ 0
	10/ 5	20/ 0	10/ 0	40/ 3	10/ 0	3/ 0	0/ 0	0/ 0
	18/ 3	13/ 5	13/ 0	33/ 0	8/ 0	5/ 0	0/ 0	0/ 0
	20/ 8	3/ 0	10/ 0	50/ 0	8/ 0	3/ 0	0/ 0	0/ 0
	18/ 10	8/ 0	20/ 0	38/ 0	8/ 0	3/ 0	0/ 0	0/ 0
	25/ 13	13/ 0	28/ 0	35/ 0	15/ 0	13/ 0	0/ 0	0/ 0
JDAY	38/ 3	28/ 3	35/ 3	33/ 3	48/ 0	15/ 0	0/ 0	0/ 0
	33/ 0	38/ 0	25/ 3	50/ 10	38/ 0	15/ 0	0/ 0	0/ 0
	35/ 0	35/ 0	20/ 10	45/ 5	45/ 3	25/ 0	0/ 0	0/ 0
	15/ 0	23/ 3	10/ 5	68/ 25	5/ 0	43/ 0	0/ 0	0/ 0
	3/ 3	25/ 3	18/ 15	45/ 5	15/ 0	23/ 0	0/ 0	0/ 0
	15/ 0	35/ 8	23/ 18	60/ 13	18/ 3	20/ 0	0/ 0	0/ 0
DALS	15/ 3	15/ 3	38/ 0	15/ 0	43/ 0	15/ 0	0/ 0	0/ 0
	10/ 0	28/ 0	43/ 0	38/ 0	30/ 0	25/ 0	0/ 0	0/ 0
	23/ 0	25/ 0	33/ 0	25/ 0	35/ 0	15/ 0	0/ 0	0/ 0
	8/ 0	13/ 0	8/ 0	63/ 10	3/ 0	20/ 0	0/ 0	0/ 0
	10/ 3	18/ 0	20/ 0	58/ 3	13/ 0	25/ 0	0/ 0	0/ 0
	15/ 0	23/ 0	20/ 0	48/ 3	8/ 0	30/ 0	0/ 0	0/ 0
BONN	3/ 0	3/ 0	5/ 0	15/ 0	8/ 0	3/ 0	0/ 0	0/ 0
	0/ 0	0/ 0	3/ 0	18/ 0	3/ 0	0/ 0	0/ 0	0/ 0
	0/ 0	0/ 0	0/ 0	10/ 0	5/ 0	0/ 0	0/ 0	0/ 0
	0/ 0	0/ 0	0/ 0	13/ 0	0/ 0	8/ 0	0/ 0	0/ 0
	5/ 0	3/ 0	3/ 0	25/ 0	3/ 0	3/ 0	0/ 0	0/ 0
	0/ 0	3/ 0	3/ 0	20/ 0	0/ 0	13/ 0	0/ 0	0/ 0
SYS	0/ 0	3/ 0	5/ 0	23/ 0	0/ 0	0/ 0	0/ 0	15/ 0
	5/ 0	3/ 0	8/ 0	35/ 0	0/ 0	0/ 0	0/ 0	15/ 0
	5/ 0	0/ 0	10/ 0	23/ 0	0/ 0	0/ 0	0/ 0	13/ 0
	3/ 0	0/ 0	5/ 0	50/ 0	0/ 0	0/ 0	0/ 0	13/ 0
	5/ 0	0/ 0	20/ 0	38/ 0	0/ 0	0/ 0	0/ 0	13/ 0
	5/ 0	3/ 0	23/ 0	35/ 0	0/ 0	0/ 0	0/ 0	15/ 0

LEGEND
FI1 = PERCENT OF RELATIVE SURVIVAL INCREASES EXCEEDING ONE PERCENT
FI5 = PERCENT OF RELATIVE SURVIVAL INCREASES EXCEEDING FIVE PERCENT
FD1 = PERCENT OF RELATIVE SURVIVAL DECREASES EXCEEDING ONE PERCENT
FD5 = PERCENT OF RELATIVE SURVIVAL DECREASES EXCEEDING FIVE PERCENT

DATE RUN= 07DEC89:09:39:37

RELATIVE CHANGES IN SYSTEM STOCK SURVIVAL
HIIXA2SAS VS AEXBAARO (BASE CASE)

PROGRAM = DSN=PJI.PF400.RNR.FISHPASS.SAS.REPORTS(FSUM156)
FILES: PJI.PF400.RNR.FISH.PASS.DATA.HIDCOLFG
PJI.PF400.RNR.FISH.PASS.DATA.HIDCOLFG

RUN DATE: OCT/17/89
RUN DATE: OCT/31/89

POOL	YEAR	YEARLING MB	YEARLING MA	YEARLING RM	SUBYEARLING MB	SUBYEARLING MA	SUBYEARLING RM	STEELHEAD MB	STEELHEAD MA	STEELHEAD RM	SOCKEYE MB	SOCKEYE MA	SOCKEYE RM
WELLS	1991	31.5	31.6	0.4	19.1	18.9	-1.1	36.0	36.1	0.3	26.8	26.6	-0.6
	1993	34.5	34.8	0.8	21.0	20.7	-1.4	39.7	40.0	0.8	28.2	28.1	-0.2
	1995	40.8	41.2	1.2	29.7	29.6	-0.3	47.3	47.8	1.1	34.9	34.9	0.1
	1997	42.0	42.5	1.3	30.0	29.5	-1.8	48.1	48.6	0.9	34.8	34.7	-0.4
	2001	41.1	41.4	0.6	29.5	29.1	-1.2	47.6	47.9	0.6	34.7	34.6	-0.3
	2005	41.4	41.7	0.6	28.5	28.2	-0.8	47.9	48.2	0.7	35.0	34.9	-0.4
[illegible]	1991	33.5	33.4	-0.1	24.6	24.2	-1.6	38.1	37.8	-0.8	0.0	0.0	0.0
	1993	32.2	32.0	-0.6	26.5	25.8	-2.5	41.6	41.5	-0.2	0.0	0.0	0.0
	1995	[illegible]	[illegible]	[illegible]	35.2	34.8	-1.1	49.8	49.7	-0.2	0.0	0.0	0.0
	1997	[illegible]	[illegible]	[illegible]	26.5	26.2	-1.4	50.4	50.3	-0.3	0.0	0.0	0.0
	2001	[illegible]	[illegible]	[illegible]	27.1	26.7	-1.7	43.0	42.8	-0.5	0.0	0.0	0.0
	2005	[illegible]	[illegible]	[illegible]	37.5	37.3	-0.5	53.5	53.4	-0.2	42.8	42.6	-0.5
RISL	1991	40.9	40.9	0.0	37.8	37.1	-1.6	54.0	54.0	-0.1	42.9	42.6	-0.6
	1993	41.1	41.1	-0.0	37.4	37.0	-0.9	52.9	52.9	-0.1	42.5	42.2	-0.8
	1995	49.9	50.0	0.3	36.5	36.3	-0.5	53.9	53.9	-0.1	43.1	42.7	-0.9
	1997	51.6	52.0	0.6									
	2001	49.9	49.9	0.1									
	2005	50.3	50.4	0.3									
LNG	1991	83.0	83.0	0.0	59.9	59.9	0.0	85.7	85.7	0.0	65.6	65.6	0.1
	1993	82.2	82.2	-0.0	60.3	60.1	-0.3	85.6	85.6	-0.0	65.4	65.3	-0.2
	1995	88.1	88.1	-0.0	70.2	70.1	-0.1	89.4	89.4	0.0	74.6	74.5	-0.1
	1997	88.5	88.5	0.0	70.5	70.4	-0.2	89.5	89.5	-0.0	74.5	74.4	-0.1
	2001	88.3	88.3	-0.0	70.9	70.7	-0.2	89.7	89.7	-0.0	74.9	74.8	-0.1
	2005	87.7	87.7	-0.0	70.2	70.1	-0.1	89.3	89.3	0.0	74.4	74.3	-0.1
LNM	1991	33.9	34.8	2.9	27.5	28.2	2.5	40.8	42.0	3.0	0.0	0.0	0.0
	1993	36.1	36.0	-0.4	28.6	27.5	-3.7	44.3	44.3	-0.1	0.0	0.0	0.0
	1995	38.3	38.3	-0.0	34.4	33.6	-2.3	46.7	46.8	0.2	0.0	0.0	0.0
	1997	38.8	38.9	0.2	36.3	34.3	-5.5	47.0	47.1	0.1	0.0	0.0	0.0
	2001	38.6	38.4	-0.4	35.6	34.7	-2.4	47.3	47.2	-0.2	0.0	0.0	0.0
	2005	38.9	38.9	0.1	33.4	32.7	-2.3	47.9	48.0	0.2	0.0	0.0	0.0
MCN	1991	59.7	59.8	0.2	42.9	42.7	-0.4	67.5	67.7	0.3	0.0	0.0	0.0
	1993	58.8	58.8	-0.1	42.9	42.5	-0.9	66.6	66.7	0.2	0.0	0.0	0.0
	1995	64.8	64.6	-0.4	53.5	53.3	-0.5	73.1	73.2	0.2	0.0	0.0	0.0
	1997	66.6	66.9	0.5	53.8	53.3	-0.9	74.2	74.4	0.2	0.0	0.0	0.0
	2001	64.3	64.7	0.5	53.6	53.3	-0.6	72.9	73.0	0.1	0.0	0.0	0.0
	2005	64.5	64.9	0.7	52.7	52.6	-0.3	73.2	73.2	0.1	0.0	0.0	0.0
JDAY	1991	54.9	55.3	0.7	45.6	45.2	-0.8	60.5	60.9	0.7	0.0	0.0	0.0
	1993	55.1	54.9	-0.3	45.4	44.6	-1.7	60.0	60.2	0.4	0.0	0.0	0.0
	1995	54.1	53.8	-0.6	47.1	46.5	-1.2	60.2	60.5	0.5	0.0	0.0	0.0
	1997	56.3	56.0	-0.4	46.5	44.9	-3.4	62.3	61.9	-0.8	0.0	0.0	0.0
	2001	55.9	55.7	-0.4	46.6	46.1	-1.2	62.2	62.0	-0.3	0.0	0.0	0.0
	2005	57.0	56.7	-0.6	45.6	45.2	-0.9	62.3	62.2	-0.2	0.0	0.0	0.0
DALS	1991	66.1	66.3	0.4	55.2	55.4	0.5	66.1	66.6	0.7	0.0	0.0	0.0
	1993	66.6	66.2	-0.5	55.3	55.3	0.1	66.4	66.4	-0.0	0.0	0.0	0.0
	1995	66.1	65.8	-0.5	56.0	56.1	0.3	66.5	66.5	0.0	0.0	0.0	0.0
	1997	69.6	69.3	-0.4	57.3	56.2	-2.0	69.2	68.8	-0.6	0.0	0.0	0.0
	2001	68.9	68.8	-0.1	56.9	56.1	-1.4	69.3	69.1	-0.3	0.0	0.0	0.0
	2005	69.4	69.2	-0.2	55.6	54.9	-1.2	69.3	69.0	-0.3	0.0	0.0	0.0
BONN	1991	87.5	87.6	0.0	79.7	79.7	0.0	83.4	83.6	0.2	0.0	0.0	0.0
	1993	87.5	87.5	-0.1	79.8	79.5	-0.3	83.3	83.4	0.1	0.0	0.0	0.0
	1995	87.2	87.0	-0.2	79.8	79.5	-0.4	82.9	82.8	-0.2	0.0	0.0	0.0
	1997	87.3	87.2	-0.1	78.7	78.4	-0.3	82.3	82.2	-0.1	0.0	0.0	0.0
	2001	87.0	87.0	-0.0	78.4	78.1	-0.4	82.0	82.0	-0.1	0.0	0.0	0.0
	2005	87.2	87.2	-0.1	78.7	78.3	-0.5	82.6	82.5	-0.1	0.0	0.0	0.0
SYS	1991	69.9	69.9	0.1	52.5	52.4	-0.2	72.9	73.0	0.2	50.9	50.9	-0.0
	1993	70.1	70.0	-0.1	52.7	52.3	-0.7	73.1	73.1	0.1	51.2	51.1	-0.2
	1995	73.8	73.7	-0.1	58.9	58.6	-0.5	76.8	76.9	0.1	59.6	59.5	-0.1
	1997	74.6	74.7	0.1	58.7	58.1	-0.9	77.3	77.3	-0.0	59.5	59.4	-0.2
	2001	73.9	73.9	0.0	58.4	58.0	-0.6	77.2	77.2	-0.0	59.7	59.5	-0.2
	2005	74.0	74.0	0.0	57.9	57.6	-0.5	77.2	77.2	-0.0	59.5	59.4	-0.2

LEGEND
MB = MEAN SURVIVAL WITH BASE CASE CONDITIONS (%) (BASE CASE)
MA = MEAN SURVIVAL WITH ALTERNATIVE CONDITIONS (%) (ALTERNATIVE)
RM = RELATIVE CHANGE IN MEAN SURVIVAL (%)
(ALTERNATIVE SURVIVAL - BASE CASE SURVIVAL) / (BASE CASE SURVIVAL)

DATE RUN= 18DEC89:11:24:00

FREQUENCY OF RELATIVE SURVIVAL CHANGES EXCEEDING ONE AND FIVE PERCENT

PROGRAM = DSN=PJI.PF400.RNR.SAS.REPORTS(FSUM1)
FILE: PJI.PF400.RNR.FISH.PASS.DATA.HIDCOLFG
FILE: PJI.PF400.RNR.FISH.PASS.DATA.HIDCOLFG

POOL	YEAR	YEARLING FI1/FI5	YEARLING FD1/FD5	SUBYEARLING FI1/FI5	SUBYEARLING FD1/FD5	STEELHEAD FI1/FI5	STEELHEAD FD1/FD5	SOCKEYE FI1/FI5	SOCKEYE FD1/FD5
WELLS	1991	50/ 3	35/ 8	35/ 5	43/ 10	45/ 3	35/ 0	48/ 3	40/ 10
	1993	45/ 3	18/ 0	45/ 8	43/ 20	50/ 3	10/ 0	30/ 3	38/ 3
	1995	65/ 5	20/ 0	43/ 5	30/ 3	63/ 0	0/ 0	45/ 0	25/ 0
	1997	73/ 5	18/ 3	33/ 5	45/ 15	60/ 0	3/ 0	23/ 0	20/ 5
	2001	55/ 0	23/ 3	35/ 13	40/ 13	55/ 0	8/ 0	35/ 0	30/ 5
	2005	53/ 0	20/ 0	45/ 8	43/ 10	53/ 0	15/ 0	40/ 0	33/ 5
[illegible]	1991	28/ 8	33/ 3	20/ 5	50/ 15	8/ 3	38/ 3	0/ 0	0/ 0
	1993	15/ 3	33/ 0	13/ 3	55/ 23	3/ 0	13/ 0	0/ 0	0/ 0
	1995	35/ 5	28/ 3	5/ 0	40/ 3	5/ 0	10/ 0	0/ 0	0/ 0
	1997	20/ 5	13/ 3	13/ 0	53/ 28	3/ 0	18/ 0	0/ 0	0/ 0
	2001	10/ 3	23/ 3	18/ 8	40/ 10	3/ 0	15/ 0	0/ 0	0/ 0
	2005	20/ 3	35/ 5	18/ 5	40/ 5	5/ 0	18/ 0	0/ 0	0/ 0
RISL	1991	23/ 3	33/ 0	23/ 0	53/ 0	33/ 5	20/ 3	28/ 3	40/ 3
	1993	23/ 3	20/ 0	28/ 3	48/ 15	15/ 3	28/ 3	18/ 3	38/ 0
	1995	20/ 3	8/ 0	18/ 0	33/ 0	18/ 0	18/ 0	18/ 0	35/ 0
	1997	5/ 3	18/ 0	18/ 0	50/ 8	15/ 0	13/ 0	8/ 0	30/ 3
	2001	20/ 3	18/ 0	20/ 3	43/ 5	15/ 0	15/ 0	10/ 0	35/ 3
	2005	20/ 5	18/ 0	33/ 0	43/ 0	15/ 0	20/ 0	8/ 0	30/ 0
LNG	1991	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
	1993	0/ 0	0/ 0	0/ 0	3/ 0	0/ 0	0/ 0	0/ 0	0/ 0
	1995	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
	1997	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
	2001	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
	2005	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
LNM	1991	63/ 45	13/ 0	78/ 48	13/ 10	73/ 45	5/ 0	0/ 0	0/ 0
	1993	8/ 3	30/ 0	13/ 0	45/ 23	10/ 0	10/ 0	0/ 0	0/ 0
	1995	20/ 0	23/ 0	8/ 0	30/ 23	13/ 0	13/ 0	0/ 0	0/ 0
	1997	20/ 3	20/ 0	5/ 0	60/ 43	10/ 0	10/ 0	0/ 0	0/ 0
	2001	8/ 0	23/ 0	13/ 0	43/ 13	3/ 0	10/ 0	0/ 0	0/ 0
	2005	20/ 3	18/ 0	18/ 0	40/ 10	13/ 0	10/ 0	0/ 0	0/ 0
MCN	1991	25/ 0	13/ 3	18/ 0	35/ 0	10/ 0	3/ 0	0/ 0	0/ 0
	1993	15/ 5	23/ 3	10/ 0	43/ 0	15/ 0	3/ 0	0/ 0	0/ 0
	1995	13/ 3	23/ 5	5/ 0	20/ 0	10/ 0	10/ 0	0/ 0	0/ 0
	1997	15/ 5	5/ 3	3/ 0	48/ 0	5/ 0	3/ 0	0/ 0	0/ 0
	2001	15/ 8	13/ 5	8/ 0	35/ 0	5/ 0	5/ 0	0/ 0	0/ 0
	2005	23/ 8	15/ 0	20/ 0	25/ 0	13/ 0	10/ 0	0/ 0	0/ 0
JDAY	1991	50/ 5	20/ 0	20/ 8	43/ 5	40/ 3	13/ 0	0/ 0	0/ 0
	1993	30/ 3	30/ 3	18/ 3	43/ 20	28/ 0	10/ 0	0/ 0	0/ 0
	1995	28/ 0	33/ 3	18/ 0	40/ 10	45/ 0	18/ 0	0/ 0	0/ 0
	1997	13/ 0	20/ 3	8/ 0	63/ 28	5/ 0	35/ 0	0/ 0	0/ 0
	2001	8/ 3	28/ 3	18/ 5	35/ 5	13/ 0	25/ 0	0/ 0	0/ 0
	2005	18/ 3	30/ 5	20/ 10	48/ 8	13/ 0	18/ 0	0/ 0	0/ 0
DALS	1991	30/ 3	18/ 0	38/ 0	13/ 0	43/ 0	5/ 0	0/ 0	0/ 0
	1993	20/ 0	28/ 3	45/ 0	23/ 0	33/ 0	23/ 0	0/ 0	0/ 0
	1995	20/ 0	25/ 3	45/ 0	20/ 0	30/ 0	18/ 0	0/ 0	0/ 0
	1997	5/ 0	15/ 0	3/ 0	53/ 10	3/ 0	20/ 0	0/ 0	0/ 0
	2001	13/ 3	25/ 0	10/ 0	40/ 3	8/ 0	20/ 0	0/ 0	0/ 0
	2005	23/ 0	20/ 0	13/ 0	43/ 0	8/ 0	18/ 0	0/ 0	0/ 0
BONN	1991	5/ 0	0/ 0	5/ 0	13/ 0	13/ 0	3/ 0	0/ 0	0/ 0
	1993	0/ 0	3/ 0	3/ 0	20/ 0	5/ 0	3/ 0	0/ 0	0/ 0
	1995	0/ 0	5/ 0	3/ 0	10/ 0	3/ 0	5/ 0	0/ 0	0/ 0
	1997	0/ 0	0/ 0	0/ 0	13/ 0	0/ 0	8/ 0	0/ 0	0/ 0
	2001	5/ 0	0/ 0	3/ 0	25/ 0	3/ 0	3/ 0	0/ 0	0/ 0
	2005	0/ 0	3/ 0	0/ 0	18/ 0	3/ 0	3/ 0	0/ 0	0/ 0
SYS	1991	3/ 0	0/ 0	15/ 0	20/ 0	3/ 0	0/ 0	3/ 0	15/ 0
	1993	3/ 0	5/ 0	5/ 0	38/ 0	3/ 0	0/ 0	3/ 0	5/ 0
	1995	0/ 0	5/ 0	3/ 0	23/ 0	0/ 0	0/ 0	0/ 0	8/ 0
	1997	3/ 0	0/ 0	3/ 0	40/ 0	0/ 0	0/ 0	0/ 0	8/ 0
	2001	5/ 0	3/ 0	10/ 0	35/ 0	0/ 0	0/ 0	0/ 0	10/ 0
	2005	5/ 0	3/ 0	3/ 0	30/ 0	0/ 0	0/ 0	0/ 0	15/ 0

LEGEND
FI1 = PERCENT OF RELATIVE SURVIVAL INCREASES EXCEEDING ONE PERCENT
FI5 = PERCENT OF RELATIVE SURVIVAL INCREASES EXCEEDING FIVE PERCENT
FD1 = PERCENT OF RELATIVE SURVIVAL DECREASES EXCEEDING ONE PERCENT
FD5 = PERCENT OF RELATIVE SURVIVAL DECREASES EXCEEDING FIVE PERCENT

DATE RUN= 18DEC89:11:30:46