CONDITION CODES

FISH CODES

A No visible marks on fish
B Flesh tear at tag site(s)
C Minor scale loss, 3 to 20%, (%'s for entire body in immediate recovery; for detailed injury examination, %'s are for section only).
D Major scale loss, >20%
E Laceration(s); tear(s), on body
F Severed body parts
G Hemorrhaging, bruised
H Stressed (lethargic, swimming poorly or sporadically)
I Spasmodic movement of body
J Very weak, barely gilling, died within 60 minutes of recovery
K Failed to enter system
L Fish likely preyed on based on telemetry, and/or circumstances relative to Turb'N recapture
M Substantial bleeding at tag site
N Bulging or missing eye(s)
P Observed predator attack or marks indicative of predator
Q Other information
R Necropsied, no obvious injuries
S Necropsied, internal injuries observed
T Trapped inside tunnel/gate well
V Fins displaced (ripped, torn, or pulled) from origin

DISSECTION CODES

B Swim bladder ruptured or expanded
D Kidneys damaged (hemorrhaging)
E Broken bones obvious
F Hemorrhaging internally
L Organ displacement
N Heart damage, ruptured, hemorrhaging, etc.
O Liver damage, rupture, hemorrhaging, etc.

FISH SURVIVAL CODES

1 Alive when recaptured or not recaptured - assigned alive
2 Dead when recaptured or not recaptured - assigned dead
3 Live/Dead status unknown

TURB'N TAG CODES

A Fully Inflated
B Partially inflated
C Pinhole, leaking
D Burst
E Not inflated at all
X Detached from fish

Appendix B

Juvenile salmon with visible injuries, major scale loss (>20% per side), and/or equilibrium loss attributed to passage through spillbays at Bonneville Dam, October 1995. Fish were released through spillbay 4 (flow deflector) and spillbay 2 (no flow deflector). Controls were released downstream of spillage from spillbay 2.

Location	Fish Number	Description of Injury
Spillbay 4: Flow Deflector	FL0	torn pectoral fin
	Left pectoral*	blood in eye; *photo*
	BE0	split dorsal fin; *photo*
	HK8	bruise at right anterior/ventral area; temporarily trapped on shore; dead at 24 h ; *photo*
	HL7	bruise at left side of head; dead at 24 h; *photo*
	PL2	scale loss
Spillbay 2: No Flow Deflector	HB5	eye exploded
	PC5	eyes hemorrhaged, bulging left eye; major scale loss; dead $\leq$1 h; *photo*
	EJ9	bruised right eye; *photo*
	Right pectoral*	bulging/hemorrhaged left eye; *photo*
	PB7	dorsal fin torn
	DD1	loss of equilibrium
	BF8	loss of equilibrium
	BK0	loss of equilibrium; temporarily trapped on shore
	EJ3	slight loss of equilibrium
	DC8	scale loss
	FC8	scale loss
	FD8	scale loss
	EH8	scale loss
	EJ1	scale loss
	HD2	scale loss
	PD5	scale loss; dead $\leq$1 h; *photo*
Controls for Spillbays	T77	large tear below dorsal tagging site; dead at 24 h; *photo*
	W77	laceration on left operculum; abrasion; major scale loss; dead at 24 h; *photo*
	N32	loss of equilibrium
	N58	scale loss
	J72	scale loss
	N99	scale loss
	T31	scale loss
	T87	scale loss

* Fin clip - identifying VI tag missing.

Appendix B

Juvenile salmon with visible injuries, major scale loss (>20% per side), and/or equilibrium loss attributed to passage through the sluices at Bonneville Dam Powerhouses 1 and 2, October 1995.

Location	Fish Number	Description of Injury
Sluice: Powerhouse #2	CH3	hemorrhaged left eye
	LF5	loss of equilibrium; dead at 24 h
Sluice: Powerhouse #1	Z11	hemorrhaged/bulging right eye
	Z77	scale loss

Appendix Table B
Length frequency distribution (10mm length groups) of treatment and control chinook salmon, by test scenario at Bonneville Dam.

SCENARIO	TREATMENT OR CONTROL	MIN	MAX	MEAN	STD
Spillbay 4, Flow deflector	CONTROL	102	159	123.179	11.0468
Spillbay 4, Flow deflector	TREATMENT	100	162	123.479	10.1292
Spillbay 2, No Flow deflector	CONTROL	102	159	123.179	11.0468
Spillbay 2, No Flow deflector	TREATMENT	100	164	124.996	11.2290
Sluiceway, PwrHs 2, gate in	TREATMENT	106	146	118.567	8.7402
Sluiceway, PwrHs 2, gate out	TREATMENT	105	160	125.500	11.2607
Sluiceway, PwrHs 1	TREATMENT	109	155	128.280	10.5132

Appendix Table B
Length frequency distribution (10mm length groups) of treatment and control chinook salmon, by test scenario at Bonneville Dam.

SCENARIO	TREATMENT OR CONTROL	LENGTH GROUP	NUMBER
Spillbay 4, Flow deflector	CONTROL	100	0
Spillbay 4, Flow deflector	CONTROL	110	28
Spillbay 4, Flow deflector	CONTROL	120	105
Spillbay 4, Flow deflector	CONTROL	130	79
Spillbay 4, Flow deflector	CONTROL	140	45
Spillbay 4, Flow deflector	CONTROL	150	21
Spillbay 4, Flow deflector	CONTROL	160	2
Spillbay 4, Flow deflector	CONTROL	170	0
Spillbay 4, Flow deflector	CONTROL	180	0
Spillbay 4, Flow deflector	TREATMENT	100	1
Spillbay 4, Flow deflector	TREATMENT	110	18
Spillbay 4, Flow deflector	TREATMENT	120	111
Spillbay 4, Flow deflector	TREATMENT	130	86
Spillbay 4, Flow deflector	TREATMENT	140	40
Spillbay 4, Flow deflector	TREATMENT	150	23
Spillbay 4, Flow deflector	TREATMENT	160	0
Spillbay 4, Flow deflector	TREATMENT	170	1
Spillbay 4, Flow deflector	TREATMENT	180	0
Spillbay 2, No Flow deflector	CONTROL	100	0
Spillbay 2, No Flow deflector	CONTROL	110	28
Spillbay 2, No Flow deflector	CONTROL	120	105
Spillbay 2, No Flow deflector	CONTROL	130	79
Spillbay 2, No Flow deflector	CONTROL	140	45
Spillbay 2, No Flow deflector	CONTROL	150	21
Spillbay 2, No Flow deflector	CONTROL	160	2
Spillbay 2, No Flow deflector	CONTROL	170	0
Spillbay 2, No Flow deflector	CONTROL	180	0
Spillbay 2, No Flow deflector	TREATMENT	100	1
Spillbay 2, No Flow deflector	TREATMENT	110	18
Spillbay 2, No Flow deflector	TREATMENT	120	90
Spillbay 2, No Flow deflector	TREATMENT	130	93
Spillbay 2, No Flow deflector	TREATMENT	140	47
Spillbay 2, No Flow deflector	TREATMENT	150	24
Spillbay 2, No Flow deflector	TREATMENT	160	6
Spillbay 2, No Flow deflector	TREATMENT	170	1
Spillbay 2, No Flow deflector	TREATMENT	180	0
Sluiceway, PwrHs 2, gate in	TREATMENT	100	0
Sluiceway, PwrHs 2, gate in	TREATMENT	110	5
Sluiceway, PwrHs 2, gate in	TREATMENT	120	14
Sluiceway, PwrHs 2, gate in	TREATMENT	130	9
Sluiceway, PwrHs 2, gate in	TREATMENT	140	1
Sluiceway, PwrHs 2, gate in	TREATMENT	150	1
Sluiceway, PwrHs 2, gate in	TREATMENT	160	0
Sluiceway, PwrHs 2, gate in	TREATMENT	170	0
Sluiceway, PwrHs 2, gate in	TREATMENT	180	0

Appendix Table B
Length frequency distribution (10mm length groups) of treatment and control chinook salmon, by test scenario at Bonneville Dam.

SCENARIO	TREATMENT OR CONTROL	LENGTH GROUP	NUMBER
Sluiceway, PwrHs 2, gate out	TREATMENT	100	0
Sluiceway, PwrHs 2, gate out	TREATMENT	110	4
Sluiceway, PwrHs 2, gate out	TREATMENT	120	23
Sluiceway, PwrHs 2, gate out	TREATMENT	130	26
Sluiceway, PwrHs 2, gate out	TREATMENT	140	12
Sluiceway, PwrHs 2, gate out	TREATMENT	150	2
Sluiceway, PwrHs 2, gate out	TREATMENT	160	3
Sluiceway, PwrHs 2, gate out	TREATMENT	170	0
Sluiceway, PwrHs 2, gate out	TREATMENT	180	0
Sluiceway, PwrHs 1	TREATMENT	100	0
Sluiceway, PwrHs 1	TREATMENT	110	3
Sluiceway, PwrHs 1	TREATMENT	120	23
Sluiceway, PwrHs 1	TREATMENT	130	33
Sluiceway, PwrHs 1	TREATMENT	140	28
Sluiceway, PwrHs 1	TREATMENT	150	11
Sluiceway, PwrHs 1	TREATMENT	160	2
Sluiceway, PwrHs 1	TREATMENT	170	0
Sluiceway, PwrHs 1	TREATMENT	180	0

Appendix Table B
Recapture times (minutes) of treatment and control chinook salmon, by test scenario at Bonneville Dam.

SCENARIO	TREATMENT OR CONTROL	MIN	MAX	MEAN	STD
Bay 4, Flow deflector	CONTROL	2	40	7.1636	4.8163
Bay 4, Flow deflector	TREATMENT	1	36	6.3885	4.3152
Bay 2, No flow deflector	CONTROL	2	40	7.1636	4.8163
Bay 2, No flow deflector	TREATMENT	1	32	6.6125	4.2879
Sluiceway, PwrHs 2, gate in	TREATMENT	4	66	11.2000	13.3045
Sluiceway, PwrHs 2, gate out	TREATMENT	2	16	6.2286	2.6275
Sluiceway, PwrHs 1	TREATMENT	1	19	5.0968	3.0183

Appendix Table B
Recapture times (minutes) of treatment and control chinook salmon, by test scenario at Bonnev

SCENARIO	TREATMENT OR CONTROL	TIME AT LARGE	NUMBER
Spillbay 4, Flow deflector	CONTROL	2	9
Spillbay 4, Flow deflector	CONTROL	4	60
Spillbay 4, Flow deflector	CONTROL	6	85
Spillbay 4, Flow deflector	CONTROL	8	48
Spillbay 4, Flow deflector	CONTROL	10	26
Spillbay 4, Flow deflector	CONTROL	12	21
Spillbay 4, Flow deflector	CONTROL	14	6
Spillbay 4, Flow deflector	CONTROL	16	3
Spillbay 4, Flow deflector	CONTROL	18	3
Spillbay 4, Flow deflector	CONTROL	20	2
Spillbay 4, Flow deflector	CONTROL	22	6
Spillbay 4, Flow deflector	TREATMENT	2	11
Spillbay 4, Flow deflector	TREATMENT	4	95
Spillbay 4, Flow deflector	TREATMENT	6	74
Spillbay 4, Flow deflector	TREATMENT	8	45
Spillbay 4, Flow deflector	TREATMENT	10	24
Spillbay 4, Flow deflector	TREATMENT	12	12
Spillbay 4, Flow deflector	TREATMENT	14	7
Spillbay 4, Flow deflector	TREATMENT	16	3
Spillbay 4, Flow deflector	TREATMENT	18	1
Spillbay 4, Flow deflector	TREATMENT	20	1
Spillbay 4, Flow deflector	TREATMENT	22	5
Spillbay 2, No Flow deflector	CONTROL	2	9
Spillbay 2, No Flow deflector	CONTROL	4	60
Spillbay 2, No Flow deflector	CONTROL	6	85
Spillbay 2, No Flow deflector	CONTROL	8	48
Spillbay 2, No Flow deflector	CONTROL	10	26
Spillbay 2, No Flow deflector	CONTROL	12	21
Spillbay 2, No Flow deflector	CONTROL	14	6
Spillbay 2, No Flow deflector	CONTROL	16	3
Spillbay 2, No Flow deflector	CONTROL	18	3
Spillbay 2, No Flow deflector	CONTROL	20	2
Spillbay 2, No Flow deflector	CONTROL	22	6
Spillbay 2, No Flow deflector	TREATMENT	2	9
Spillbay 2, No Flow deflector	TREATMENT	4	89
Spillbay 2, No Flow deflector	TREATMENT	6	82
Spillbay 2, No Flow deflector	TREATMENT	8	34
Spillbay 2, No Flow deflector	TREATMENT	10	21
Spillbay 2, No Flow deflector	TREATMENT	12	10
Spillbay 2, No Flow deflector	TREATMENT	14	11
Spillbay 2, No Flow deflector	TREATMENT	16	5
Spillbay 2, No Flow deflector	TREATMENT	18	4
Spillbay 2, No Flow deflector	TREATMENT	20	2
Spillbay 2, No Flow deflector	TREATMENT	22	4

Appendix Table B
Recapture times (minutes) of treatment and control chinook salmon, by test scenario at Bonneville Dam.

SCENARIO	TREATMENT OR CONTROL	TIME AT LARGE	NUMBER
Sluiceway, PwrHs 2, gate in	TREATMENT	2	0
Sluiceway, PwrHs 2, gate in	TREATMENT	4	2
Sluiceway, PwrHs 2, gate in	TREATMENT	6	5
Sluiceway, PwrHs 2, gate in	TREATMENT	8	3
Sluiceway, PwrHs 2, gate in	TREATMENT	10	6
Sluiceway, PwrHs 2, gate in	TREATMENT	12	0
Sluiceway, PwrHs 2, gate in	TREATMENT	14	2
Sluiceway, PwrHs 2, gate in	TREATMENT	16	1
Sluiceway, PwrHs 2, gate in	TREATMENT	18	0
Sluiceway, PwrHs 2, gate in	TREATMENT	20	0
Sluiceway, PwrHs 2, gate in	TREATMENT	22	1
Sluiceway, PwrHs 2, gate out	TREATMENT	2	2
Sluiceway, PwrHs 2, gate out	TREATMENT	4	14
Sluiceway, PwrHs 2, gate out	TREATMENT	6	25
Sluiceway, PwrHs 2, gate out	TREATMENT	8	20
Sluiceway, PwrHs 2, gate out	TREATMENT	10	7
Sluiceway, PwrHs 2, gate out	TREATMENT	12	0
Sluiceway, PwrHs 2, gate out	TREATMENT	14	0
Sluiceway, PwrHs 2, gate out	TREATMENT	16	2
Sluiceway, PwrHs 2, gate out	TREATMENT	18	0
Sluiceway, PwrHs 2, gate out	TREATMENT	20	0
Sluiceway, PwrHs 2, gate out	TREATMENT	22	0
Sluiceway, PwrHs 1	TREATMENT	2	11
Sluiceway, PwrHs 1	TREATMENT	4	37
Sluiceway, PwrHs 1	TREATMENT	6	26
Sluiceway, PwrHs 1	TREATMENT	8	11
Sluiceway, PwrHs 1	TREATMENT	10	4
Sluiceway, PwrHs 1	TREATMENT	12	1
Sluiceway, PwrHs 1	TREATMENT	14	0
Sluiceway, PwrHs 1	TREATMENT	16	1
Sluiceway, PwrHs 1	TREATMENT	18	1
Sluiceway, PwrHs 1	TREATMENT	20	1
Sluiceway, PwrHs 1	TREATMENT	22	0

Appendix B
Tag recapture data for juvenile chinook salmon for each Turb-N Tag trial at Bonneville Dam.

---------- Scenario=Gate 4, Flow deflector || Treatment or Control=' Control' ----------

Testlot	Number released	Total number of fish recovered	Total number of fish not recovered	Number alive	Number dead	Tags w/ no fish	Nothing/ unknown	# alive after 24h	# alive after 48h
2	40	38	2	38	0	2	0	38	38
3	40	39	1	39	0	0	1	39	39
4	40	38	2	38	0	0	2	38	38
5	40	40	0	40	0	0	0	40	40
6	40	40	0	40	0	0	0	39	39
7	40	37	3	37	0	3	0	36	36
8	40	37	3	37	0	0	3	37	37
TOTAL	280	269	11	269	0	5	6	267	267

---------- Scenario=Gate 4, Flow deflector || Treatment or Control=' Treatment' ----------

Testlot	Number released	Total number of fish recovered	Total number of fish not recovered	Number alive	Number dead	Tags w/ no fish	Nothing/ unknown	# alive after 24h	# alive after 48h
2	40	40	0	40	0	0	0	40	40
3	40	40	0	40	0	0	0	40	40
4	40	40	0	40	0	0	0	40	40
5	40	40	0	40	0	0	0	40	40
6	40	40	0	40	0	0	0	38	38
7	40	38	2	38	0	1	1	38	38
8	40	40	0	40	0	0	0	40	40
TOTAL	280	278	2	278	0	1	1	276	276

---------- Scenario=Gate 2, No flow deflector || Treatment or Control=' Control' ----------

Testlot	Number released	Total number of fish recovered	Total number of fish not recovered	Number alive	Number dead	Tags w/ no fish	Nothing/ unknown	# alive after 24h	# alive after 48h
2	40	38	2	38	0	2	0	38	38
3	40	39	1	39	0	0	1	39	39
4	40	38	2	38	0	0	2	38	38
5	40	40	0	40	0	0	0	40	40
6	40	40	0	40	0	0	0	39	39
7	40	37	3	37	0	3	0	36	36
8	40	37	3	37	0	0	3	37	37
TOTAL	280	269	11	269	0	5	6	267	267

Appendix B
Tag recapture data for juvenile chinook salmon for each Turb-N Tag trial at Bonneville Dam.

---------- Scenario=Gate 2, No flow deflector || Treatment or Control=' Treatment' ----------

Testlot	Number released	Total number of fish recovered	Total number of fish not recovered	Number alive	Number dead	Tags w/ no fish	Nothing/ unknown	# alive after 24h	# alive after 48h
2	40	38	2	38	0	2	0	38	38
3	40	36	4	36	0	3	1	36	36
4	40	39	1	39	0	1	0	39	39
5	40	40	0	40	0	0	0	40	40
6	40	39	1	39	0	1	0	39	39
7	40	39	1	39	0	1	0	39	39
8	40	40	0	38	2	0	0	38	38
TOTAL	280	271	9	269	2	8	1	269	269

---------- Scenario=Sluice, PwrHs 2, gate in || Treatment or Control=' Treatment' ----------

Testlot	Number released	Total number of fish recovered	Total number of fish not recovered	Number alive	Number dead	Tags w/ no fish	Nothing/ unknown	# alive after 24h	# alive after 48h
10	30	20	10	20	0	3	7	19	19

---------- Scenario=Sluice, PwrHs 2, gate out || Treatment or Control=' Treatment' ----------

Testlot	Number released	Total number of fish recovered	Total number of fish not recovered	Number alive	Number dead	Tags w/ no fish	Nothing/ unknown	# alive after 24h	# alive after 48h
10	70	70	0	70	0	0	0	70	70

---------- Scenario=Sluice, PwrHs 1 || Treatment or Control=' Treatment' ----------

Testlot	Number released	Total number of fish recovered	Total number of fish not recovered	Number alive	Number dead	Tags w/ no fish	Nothing/ unknown	# alive after 24h	# alive after 48h
11	100	93	7	93	0	1	6	93	93
	1320	1270	50	1268	2	23	27	1261	1261