

**Mass Marking and Mark
Selective Fisheries:
Perspectives From Columbia
River Tribal Fisheries
Management Experience**

Michael A. Matylewich

Columbia River Inter-Tribal Fish Commission

Proposed Objectives for MSF

- Reduce harvest impacts on wild (unmarked) fish (Conservation Objective)
- Increase access to harvestable hatchery (marked) fish (Allocation Objective)

Addressing Uncertainties

- Incidental Mortality Rates
 - Assumed To Be Constant
- Survival Rates
 - Natural Mortality Differential
 - Fishing Mortality Differential

Addressing Uncertainties

- Marking Costs
 - Equipment Expense
- Sampling Costs
 - People Intensive

Addressing Uncertainties

- Magnitude of Fisheries
 - Expansion Undefined
- Management Information Needs
 - No Longer Experience Same Fishing Mortality
 - Alternative Management Scheme Not Yet Developed

Addressing Uncertainties

- Climate Change
 - Potential Loss of Natural Production From Mid-Elevation Basins
- Increased Human Population
 - Additional Pressures on Natural Production Habitat

Unintended Consequences

- Estimation of Impacts on Unmarked Fish
- Reallocation of Conservation Burden
 - Mitigation Obligations Redefined
 - Reallocation of Restoration Funding

Unintended Consequences

- Allocation Shifts
 - Gauntlet Effects
 - Changes in Mark Rates
- Legal Obligations
 - Treaty Fishing Rights
 - ESA Concerns

Columbia River Spring Chinook

- MSF Implemented Starting In 2001
 - Large Increases In Non-Indian Catches
 - Gillnet Incidental Mortality Highly Variable
 - Allocation Changes
 - Change In Mark Rate In Indian Fishery

Table 7. Estimated numbers of Adult Upriver Spring Chinook Entering the Columbia River, Mainstem Harvest and Escapement, 1980-2006.

Year	Upriver Run ¹	Non-Indian Catch ³				Bonn. Dam Count ⁶	Non-Indian Zone 6 Sport	Treaty Indian Zone 6 ²				Zones 1-6 % of run	Escapement	
		Zones 1-5						Winter Gillnet	Comm. Gillnet	Ceremonial & platform	Total		No. ⁷	% of Run
Comm.	Sport ⁴	Misc. ⁵	Total											
80-84 Ave.	63,153	951	320	182	1,452	61,700	0	1,008	0	2,306	3,313	7.5%	58,387	92.5%
85-89 Ave.	104,837	2,308	806	222	3,335	101,501	0	208	0	5,991	6,199	0%	95,303	90.9%
1990	105,213	2,082	3,115	150	5,347	99,866	0	4	0	6,924	6,928	11.2%	92,938	88.3%
1991	64,233	897	1,537	120	2,254	61,679	0	5	0	3,871	3,876	9.5%	57,803	90.0%
1992	95,323	235	1,187	162	1,584	93,739	0	48	0	5,711	5,759	7.7%	87,980	92.3%
1993	119,203	238	413	373	1,024	118,179	0	0	0	7,296	7,296	7.0%	110,883	93.0%
1994	23,809	441	409	86	936	22,873	0	10	0	1,151	1,161	8.8%	21,712	91.2%
1995	12,634	0	5	2	7	12,627	0	13	0	620	633	5.1%	11,994	94.9%
1996	55,299	5	17	41	63	55,236	0	0	0	2,911	2,911	5.4%	52,325	94.6%
1997	123,824	9	13	44	66	123,758	0	14	0	8,309	8,323	6.8%	115,435	93.2%
1998	43,512	0	14	27	41	43,471	0	1	0	2,224	2,225	5.2%	41,246	94.8%
1999	42,582	2	21	26	49	42,533	0	1	0	1,983	1,984	4.8%	40,549	95.2%
2000	186,141	88	102	177	367	185,774	0	6	1,348	9,973	11,327	6.3%	174,447	93.7%
2001	437,910	1,579	22,714	964	25,257	412,653	93	85	43,630	10,985	54,700	18.3%	357,860	81.7%
2002	331,303	9,483	16,213	667	26,363	304,940	875	45	24,209	9,208	33,462	18.3%	270,603	81.7%
2003	242,638	2,759	9,615	765	13,139	229,499	1,302	857	8,348	9,090	18,295	13.5%	209,902	86.5%
2004	221,600	5,989	17,041	245	23,275	198,325	1,349	2	8,368	9,114	17,484	19.0%	179,492	81.0%
2005	106,935	2,246	7,235	57	9,538	97,397	449	1	0	6,163	6,164	15.1%	90,784	84.9%
2006	132,138	1,689	4,161	130	5,980	126,158	648	0	0	8,401	8,401	11.4%	117,109	88.6%

Columbia River Steelhead

- MSF Implemented In Early 1980s for Non-Indian Recreational Fishery
 - Limited Restoration Actions Implemented In Other Parts of the Life Cycle
 - Wild Return Fluctuates With Hatchery Returns

Table 12. Skamania Index, Group A Index, and Group B Index Returns of Summer Steelhead to Bonneville Dam During 1986-2006.

Year	<u>Skamania Index</u>			<u>Group A Index</u>			<u>Group B Index</u>			<u>Total Upriver</u>		
	Wild	Hatchery	Total	Wild	Hatchery	Total	Wild	Hatchery	Total	Wild	Hatchery	Total
1986	5.5	19.3	24.8	56.6	230.9	287.5	10.0	54.0	64.0	72.1	304.2	376.3
1987	7.4	10.4	17.8	106.7	131.6	238.3	14.0	31.0	45.0	128.1	173.0	301.1
1988	4.2	18.2	22.4	64.3	108.8	173.1	17.7	63.9	81.6	86.2	190.9	277.1
1989	3.8	11.9	15.7	57.5	135.6	193.1	12.4	65.2	77.6	73.7	212.7	286.4
1990	3.7	15.0	18.7	27.1	88.5	115.6	8.8	38.4	47.2	39.6	141.9	181.5
1991	1.2	9.7	10.9	60.3	173.8	234.1	6.2	22.1	28.3	67.7	205.6	273.3
1992	2.9	12.0	14.9	44.3	197.2	241.5	12.7	44.7	57.4	59.9	253.9	313.8
1993	1.3	13.1	14.4	28.6	108.1	136.7	4.4	31.8	36.2	34.3	153.0	187.3
1994	1.4	10.9	12.3	21.2	99.8	121.0	5.2	22.3	27.5	27.8	133.0	160.8
1995	1.1	7.1	8.2	26.0	154.0	180.0	1.8	11.4	13.2	28.9	172.5	201.4
1996	1.3	9.5	10.8	25.7	148.6	174.3	3.9	14.9	18.8	30.9	173.0	203.9
1997	0.9	11.0	11.9	30.9	177.4	208.3	3.9	32.7	36.6	35.7	221.1	256.8
1998	1.6	7.8	9.4	34.8	99.9	134.7	3.4	36.8	40.2	39.8	144.5	184.3
1999	1.3	5.9	7.2	56.6	119.8	176.4	3.7	18.4	22.1	61.6	144.1	205.7
2000	5.7	10.9	16.6	63.6	153.1	216.7	8.4	32.5	40.9	77.7	196.5	274.2
2001	7.9	20.8	28.7	137.2	377.9	515.1	12.1	74.3	86.4	157.2	473.0	630.2
2002	9.7	15.3	25.0	87.3	235.8	323.1	32.3	97.6	129.9	129.3	348.7	478.0
2003	1.8	12.4	14.2	66.4	238.1	304.5	6.5	32.0	38.5	74.7	282.5	357.2
2004 ¹	4.1	16.9	21.0	60.4	190.2	250.6	9.2	28.2	37.4	73.7	235.3	309.0
2005 ²	2.8	9.2	12.0	58.9	192.7	251.6	9.6	39.3	48.9	71.3	241.2	312.5
2006	2.2	7.7	9.9	63.7	181.4	245.1	8.5	65.7	74.2	74.4	254.8	329.2

Table 13. Summer steelhead Counts by Run Year at Lower Granite Dam with Wild Steelhead Estimates and Goals, 1984-2006.

Run Year	Run Year Totals	Wild ¹		Percent of 30,000 Goal
		Number	Percent	
1984-1985	104,400	24,500	23	82
1985-1986	116,300	26,700	23	89
1986-1987	130,000	22,000	17	73
1987-1988	71,300	25,500	36	85
1988-1989	87,100	21,000	24	70
1989-1990	131,400	25,000	19	83
1990-1991	56,900	9,300	16	31
1991-1992	99,100	17,300	17	58
1992-1993	128,300	19,400	15	65
1993-1994	59,800	7,400	12	25
1994-1995	47,300	7,500	16	25
1995-1996	79,100	8,000	10	27
1996-1997	83,300	7,300	9	24
1997-1998	87,000	8,600	10	29
1998-1999	70,700	9,300	13	31
1999-2000	73,800	12,100	16	40
2000-2001	116,300	21,400	18	71
2001-2002	269,300	40,400	15	135
2002-2003	222,200	43,100	19	144
2003-2004	(153,400)	(36,100)	(24)	(120)
2004-2005	(152,700)	(35,200)	(23)	(117)

Summary

- Simple Solution to Complex Problem
 - Need to Address Entire Life Cycle to Restore Populations and Fisheries
- Unaddressed Uncertainties May Accentuate Unintended Consequences
 - Conservation Goals and Allocation Goals May Not Be Achieved

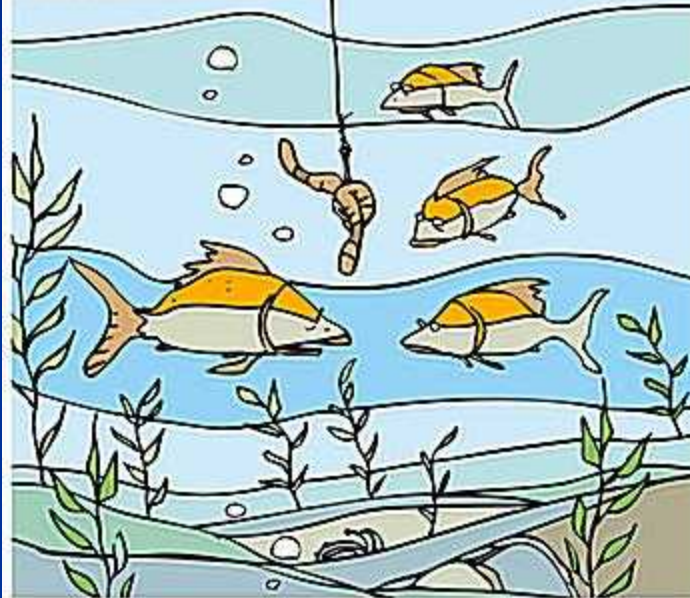
Summary

- State, Tribal and Federal Agencies Must Work Together To Reach Mutual Goals

© Original Artist
Reproduction rights obtainable from
www.CartoonStock.com

© Mike Baldwin / Corbis

Baldwin



"Sure, it looks good. Too good.
Trust me, there's always a catch."