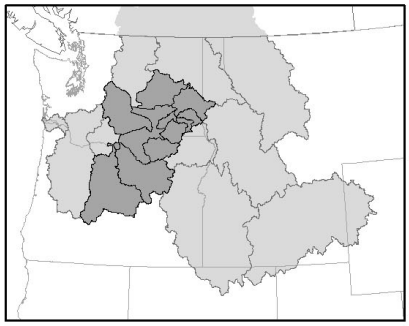
Columbia Plateau Province

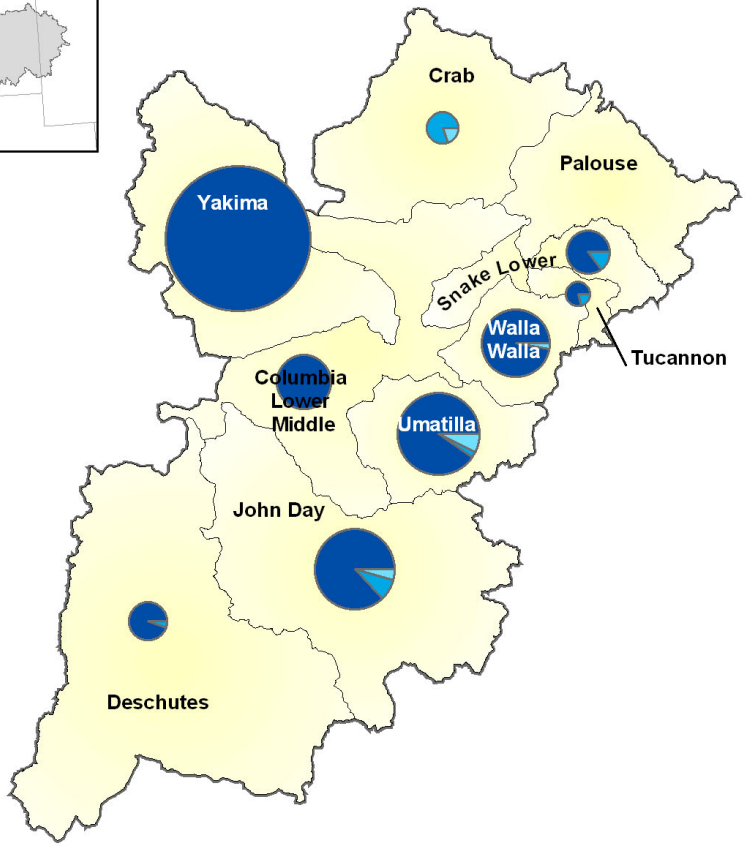
Columbia Basin Fish and Wildlife Authority



Columbia Plateau Province

BPA Spending, FY 2001-2004

FY 2001	$25,408,751
FY 2002	$40,621,776
FY 2003	$28,968,486
FY 2004	$26,720,271
Total Spending	$121,719,283



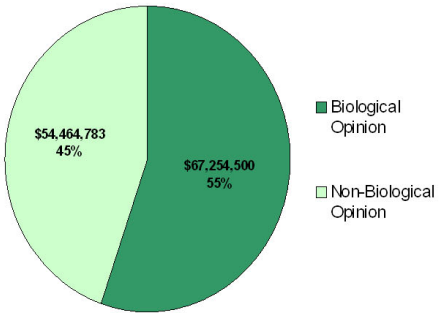
Legend

- Anadromous (93%)
- Resident (4%)
- Wildlife (3%)

Note: Diameter of pie represents relative funding levels in each subbasin.

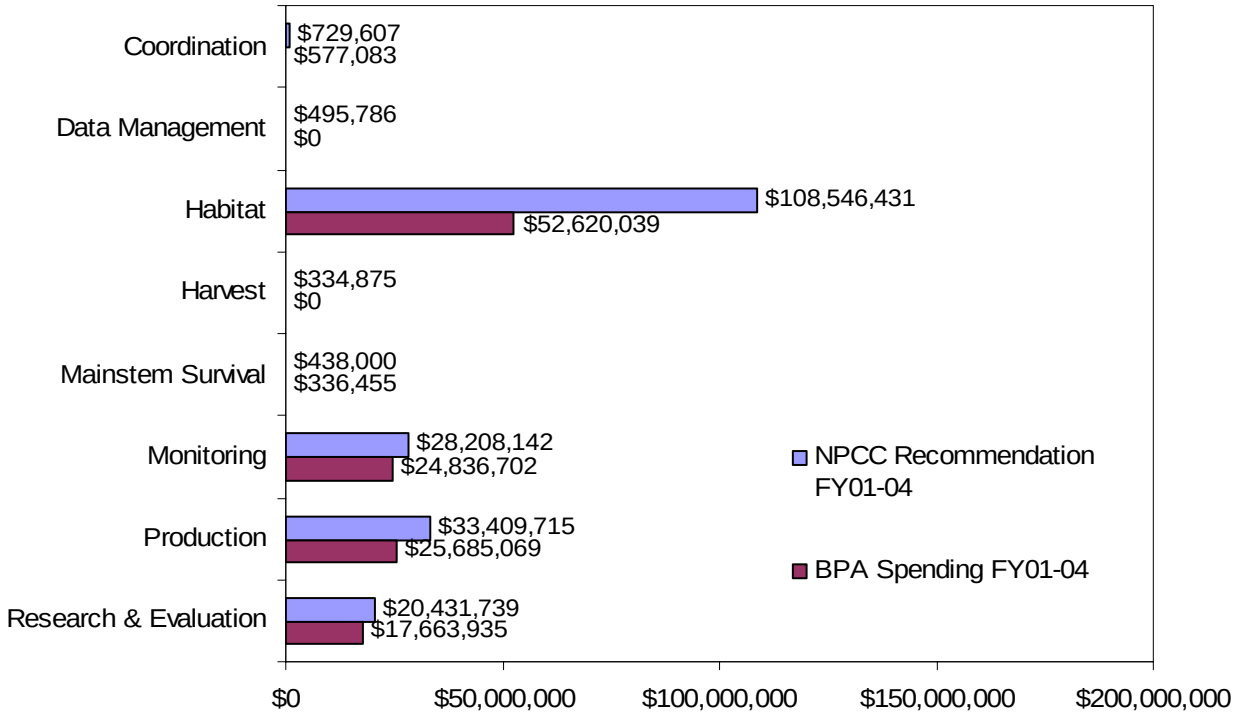
Biological Opinion Spending, FY 2001-2004
NMFS & USFWS Designated Projects

	BiOp	Non BiOp
Columbia Lower Middle	$2,392,930	$5,229,391
Crab	$0	$2,603,270
Deschutes	$2,466,550	$1,298,323
John Day	$16,066,850	$738,046
Palouse	$0	$0
Snake Lower	$4,215,048	$728,020
Tucannon	$1,508,435	$45,360
Umatilla	$4,343,602	$13,207,870
Walla Walla	$7,194,273	$4,706,526
Yakima	$29,066,811	$25,907,978

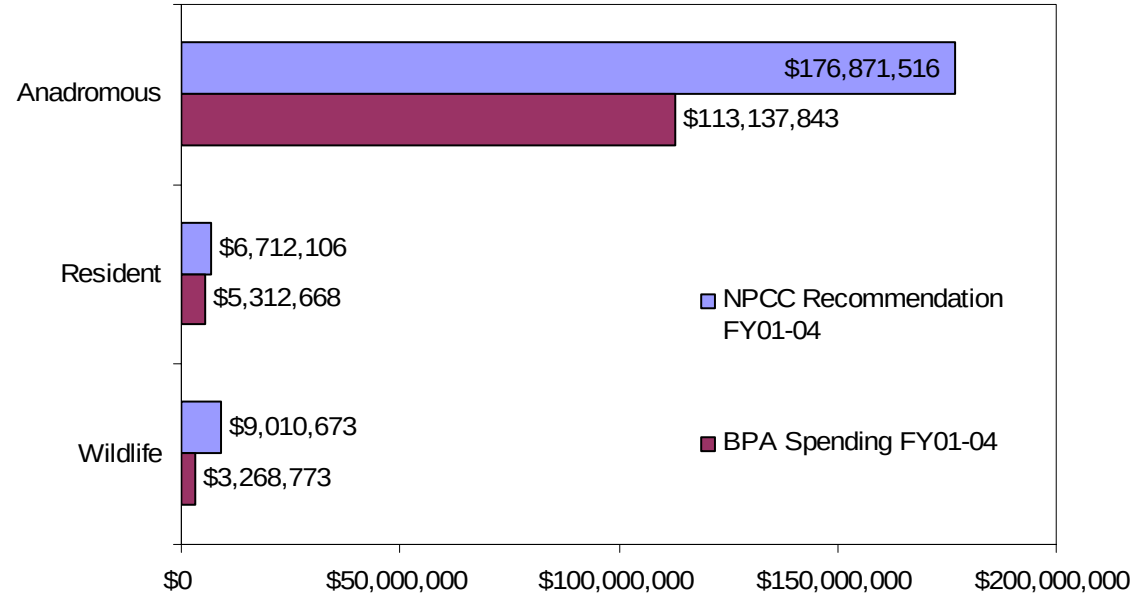


Columbia Plateau Province FY 2001-2004 Spending Summaries

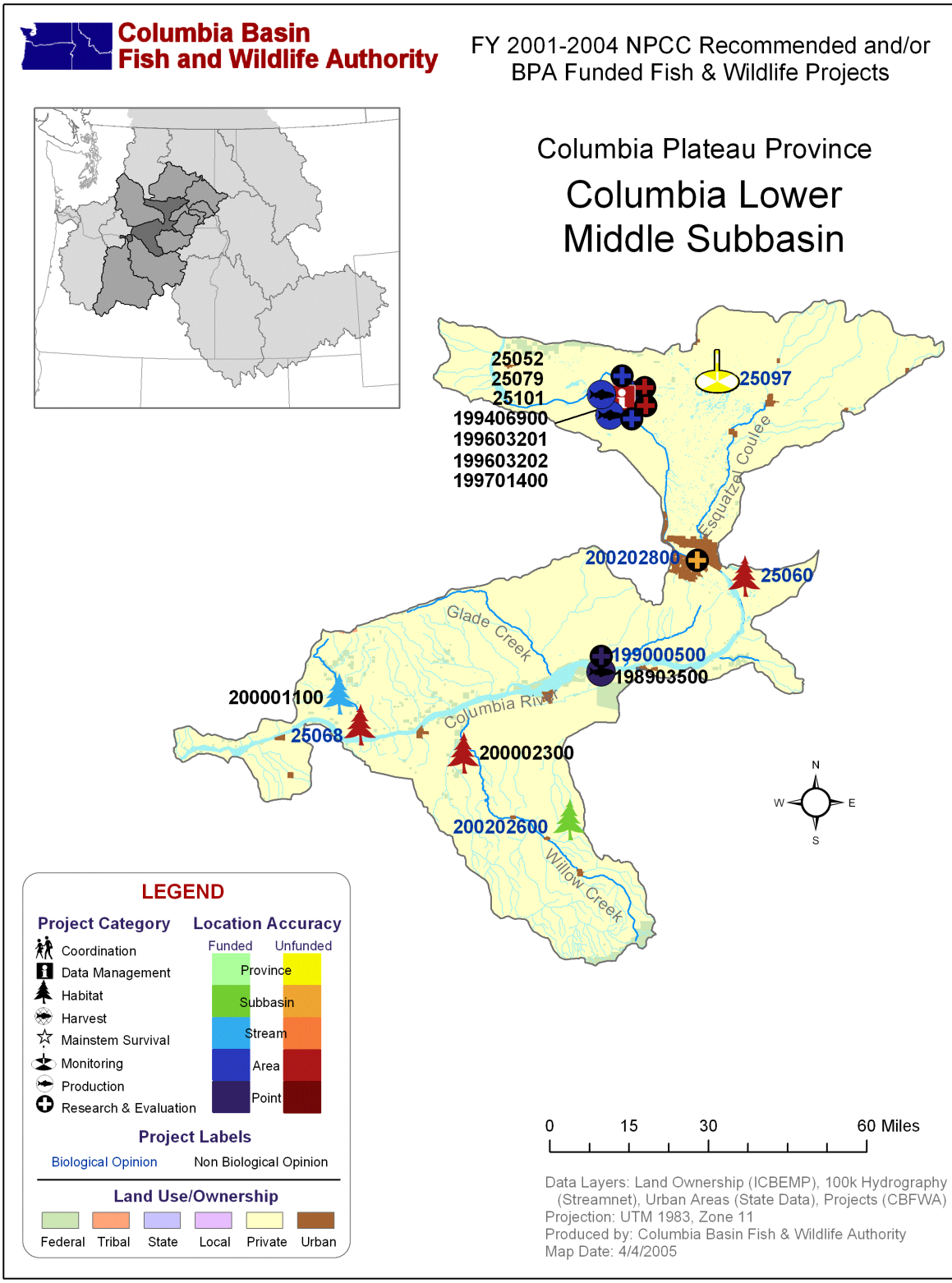
NPCC Recommendations and BPA Spending by Project Category, FY01-04



NPCC Recommendations and BPA Spending by Project Type, FY01-04



Columbia Lower Middle Subbasin



Projects in the Columbia Lower Middle Subbasin

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
25052	Sex Reversal in Hanford Reach Fall Chinook Salmon				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$262,321	$ 0	Anadromous	Research & Evaluation	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25060	Burbank Sloughs and Mainstem Columbia River Shoreline/Side Channel/Wetland Habitat Restoration				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$116,000	$ 0	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25068	Rock Creek Watershed Road and Riparian Corridor Improvement Project				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$96,500	$96,500	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25079	Integration and Construction of a GIS Based 2-Dimensional Hydraulic/Habitat Model for 51 miles of Hanford Reach and Site of the Columbia River				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$295,786	$200,000	$ 0	Anadromous	Data Management	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25097	Salmon and Steelhead Habitat Inventory and Assessment Project (SSHIAP)				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$522,710	$372,550	$ 0	Anadromous	Monitoring	province
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25101	Use of Mainstem Habitats by Juvenile Pacific Lamprey (Lampetra tridentata)*				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$89,238	$ 0	$ 0	Anadromous	Research & Evaluation	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
198903500	Umatilla Hatchery Operation and Maintenance				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$860,000	$889,240	$919,474	$906,604	Anadromous	Production	point
BPA Spent	$915,201	$1,028,443	$815,317	$816,165			
199000500	**Umatilla Fish Hatchery Monitoring and Evaluation**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$693,311	$626,178	$631,381	$572,848	Anadromous	Research & Evaluation	point
BPA Spent	$554,340	$623,211	$544,418	$524,883			

Projects in **bold** have preliminary results data included in this report.

Projects in the Columbia Lower Middle Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
199406900	Estimate production potential of fall chinook salmon in the Hanford Reach of the Columbia River				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$225,000	$232,650	$240,560	$248,739	Anadromous	Research & Evalua-tion	area
BPA Spent	$162,261	$419,986	$266,003	$241,459			
199603201	Begin Implementation of Year 1 of the K Pool Master Plan Program				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Production	area
BPA Spent	$ 0	$2,235	$ 0	$ 0			
199603202	Hanford K Basin Master Plan				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Production	area
BPA Spent	$ 0	$130,902	$ 0	$ 0			
199701400	**Evaluation of Juvenile Fall Chinook Stranding on the Hanford Reach**				**Columbia Plateau**		**no**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$341,784	$353,404	$18,000	$ 0	Anadromous	Research & Evalua-tion	area
BPA Spent	$213,856	$160,790	$ 0	$ 0			
200001100	Rock Creek Watershed Assessment/Restoration				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$ 0	$44,224	$12,549	$ 0			
200002300	Securing Wildlife Mitigation Sites - Oregon, Horn Butte (Philippi Property)				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$42,302	$200,000	$2,000,000	$ 0	Wildlife	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
200202600	**Morrow County Buffer Initiative**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$75,086	$77,337	$77,337	Anadromous	Habitat	county
BPA Spent	$ 0	$21,895	$68,276	$55,907			
200202800	Conduct Watershed Assessments for Priority Watersheds on Private Lands in the Columbia Plateau				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$1,259,725	$89,725	$ 0	Anadromous	Research & Evalua-tion	subbasin
BPA Spent	$ 0	$ 0	$ 0	$ 0			

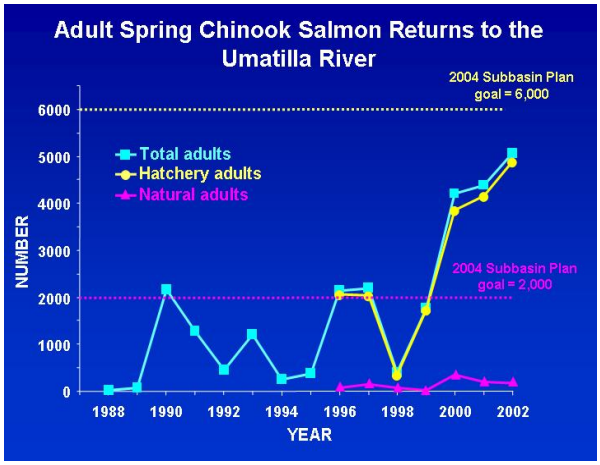
Projects in **bold** have preliminary results data included in this report.

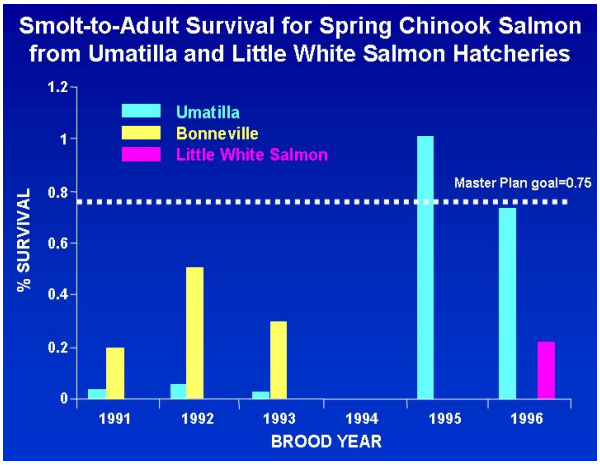
Project 199000500 — *Umatilla Fish Hatchery Monitoring and Evaluation*

2002-2003 Project Objectives

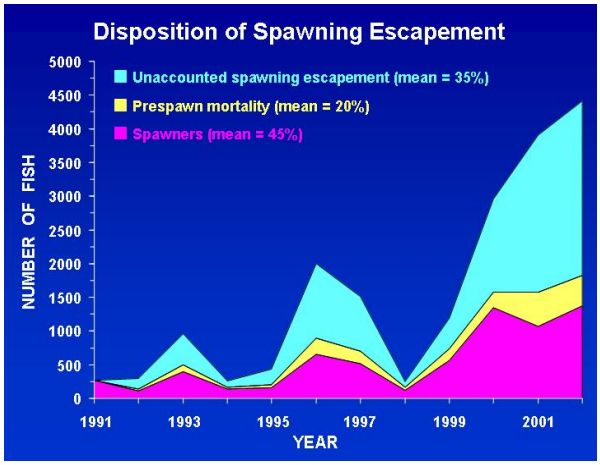
- Determine success in achieving adult return and smolt-to-adult survival goals
- Develop optimum rearing and release strategies for spring Chinook salmon , fall Chinook salmon , and summer steelhead
- Determine catch distribution, catch contribution, straying, and escapement for spring Chinook salmon, fall Chinook salmon, and summer steelhead
- Determine success in restoring and enhancing recreational fisheries
- Assess success of reestablishing natural production of spring Chinook salmon
- Compare life history characteristics and productivity of natural and hatchery summer steelhead

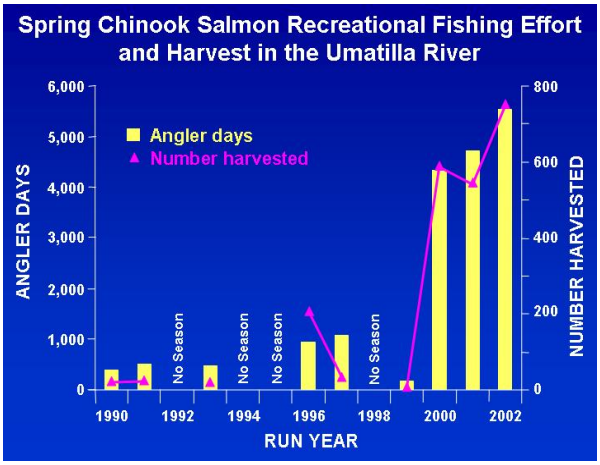
Adult Returns and Smolt–to-Adult Survival (Spring Chinook) —Preliminary Results



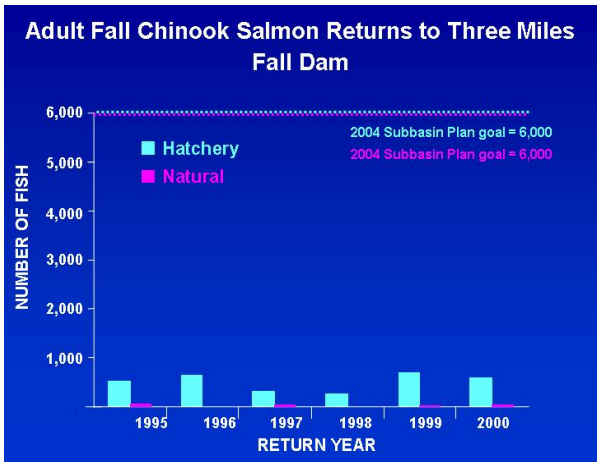


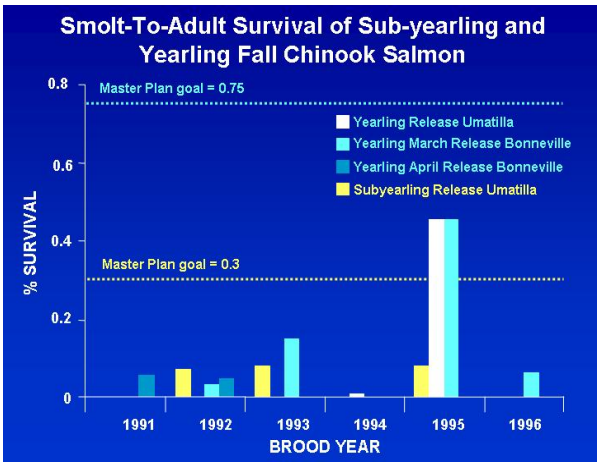
Catch and Escapement (Spring Chinook) —Preliminary Results



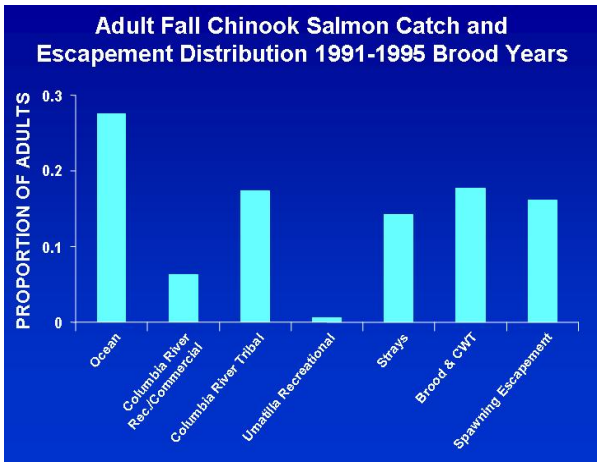


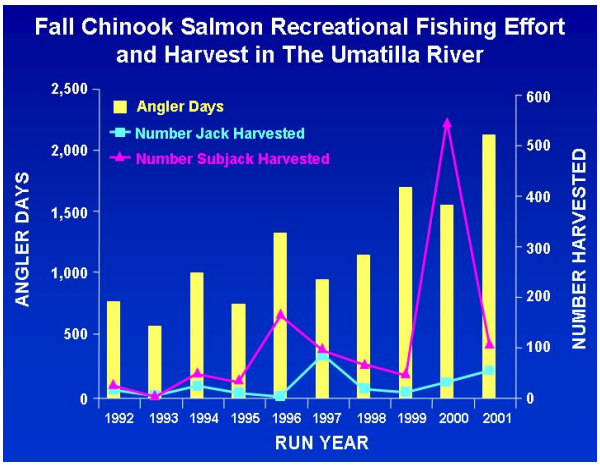
Adult Returns and Smolt-to-Adult Survival (Fall Chinook)—Preliminary Results



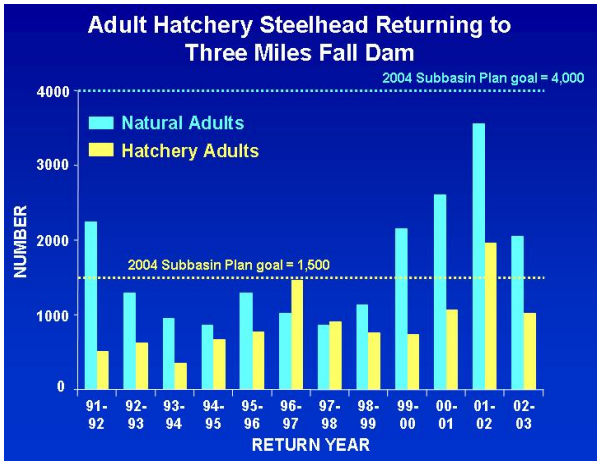


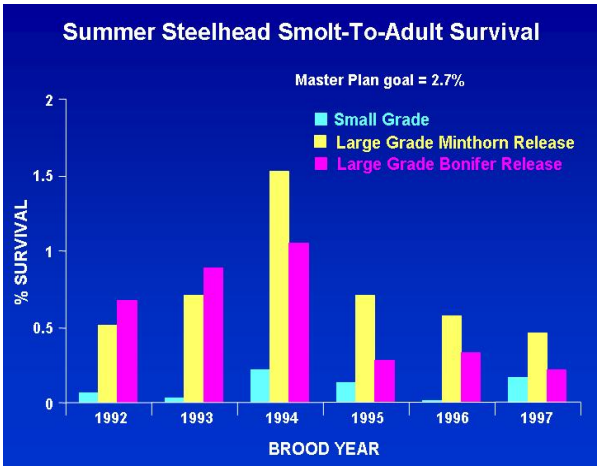
Catch and Escapement (Fall Chinook) —Preliminary Results



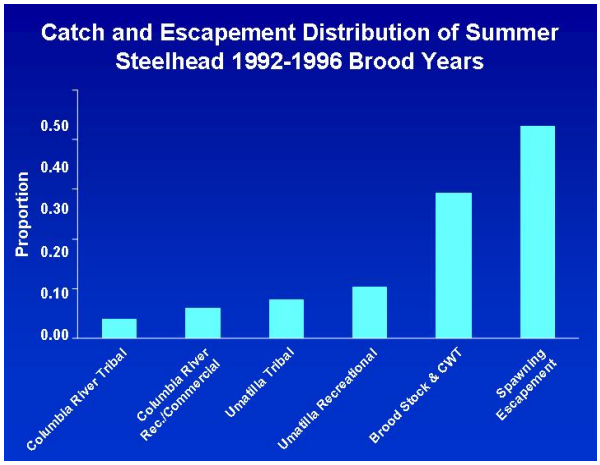


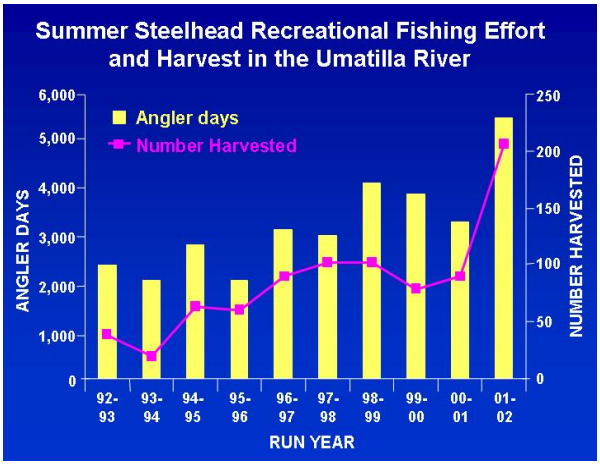
Adult Returns and Smolt-to-Adult Survival (Summer Steelhead)—Preliminary Results





Catch and Escapement (Summer Steelhead) —Preliminary Results





Spring Chinook Salmon

- Spring Chinook salmon adult returns and smolt-to-adult survival goals have not been achieved for most years
- Progeny per parent ratios of naturally spawning hatchery fish have been mostly below 1.0, resulting in few natural adult returns
- Adult pre-spawning mortality is a significant factor limiting production of spring Chinook salmon
- Reestablished popular recreational fishery for spring Chinook salmon that continues to expand

Fall Chinook Salmon

- Fall Chinook salmon adult returns and smolt-to-adult survival goals have not been achieved for any year
- Umatilla fall Chinook salmon contribute substantially to ocean and Columbia River mainstem fisheries
- Fall Chinook stray rates into the Snake and Upper Columbia rivers are high, but have declined through time
- Limited success in establishing a recreational fishery for fall Chinook salmon

Summer Steelhead

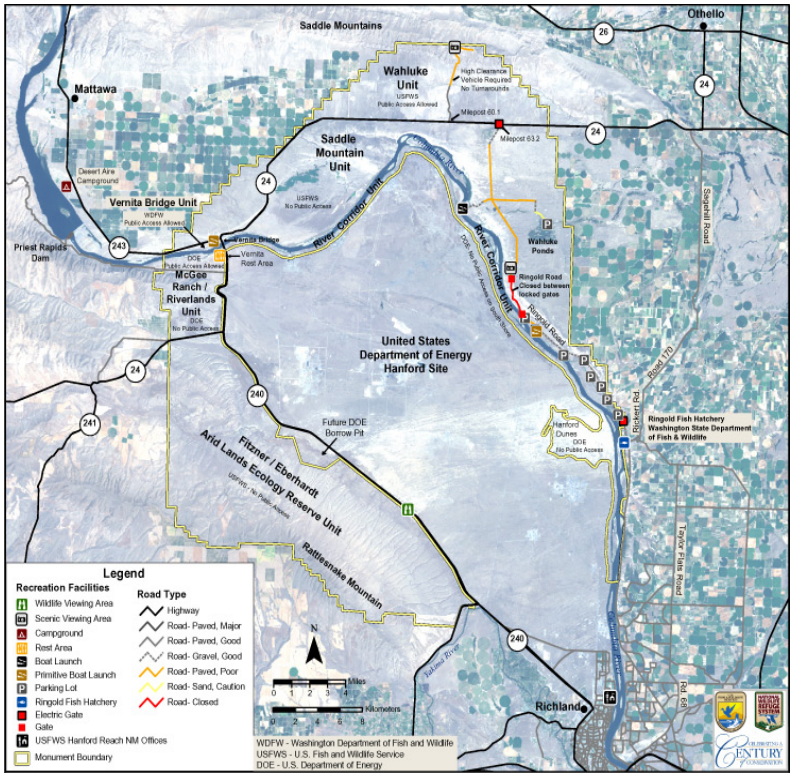
- Summer steelhead adult returns and smolt-to-adult survival goals have not been achieved for any year
- Progeny-per-parent ratios for hatchery fish have been above 1.0 whereas, ratios for naturally spawning hatchery/natural fish have been below 1.0 for most years
- Life history characteristics of hatchery steelhead are similar to natural steelhead
- Harvest of hatchery origin summer steelhead in the Umatilla River has been low

Project 199701400 — *Evaluation of Juvenile Fall Chinook Stranding on the Hanford Reach*

2002-2003 Project Objectives

- Estimate the number of wild juvenile Chinook salmon killed and placed at risk within the 17 mile designated sampling area during the special operations period

Preliminary Results



- Emergence typically occurs in March and coincides with low flows
- End of emergence corresponds to peak abundance and length frequencies highly susceptible to stranding/entrapment

The Hanford Reach is subject to flow manipulation from Priest Rapids Dam, where hourly flows fluctuate rapidly due to changes in hydroelectric generation, irrigation, water storage, and flood control. These fluctuations cause stranding of newly emerged and rearing fall Chinook salmon on gently sloped banks, and gravel bars, and entrapment during early life stages in potholes formed by the receding water. (Photographs: Courtesy of the Washington Department of Fish and Wildlife)

Preliminary Results

Estimated annual impacts (mortality and at risk) to juvenile fall chinook in the Hanford Reach, 1999-2003

2003	Mean	Mean - 1.96 S.E.	Mean + 1.96 S.E.
Morts	154,853	83,903	225,802
Rev Morts	154,853	83,903	225,802
At Risk	164,643	91,093	238,192
2002	Mean	Mean - 1.96 S.E.	Mean + 1.96 S.E.
Morts	67,409	28,623	106,195
Rev Morts	70,903	31,517	110,288
At Risk	144,249	28,813	259,685
2001	Mean	Mean - 1.96 S.E.	Mean + 1.96 S.E.
Morts	2,013,638	-746,334	4,773,611
Rev Morts	2,013,638	-746,334	4,773,611
At Risk	2,013,638	-746,334	4,773,611
2000	Mean	Mean - 1.96 S.E.	Mean + 1.96 S.E.
Morts	45,487	12,866	78,108
Rev Morts	192,824	-70,865	456,514
At Risk	199,534	-64,234	463,302
1999	Mean	Mean - 1.96 S.E.	Mean + 1.96 S.E.
Morts	93,943	21,393	166,493
Rev Morts	NA	NA	NA
At Risk	320,650	-54,006	695,307

(Chris Murray, Pacific Northwest National Laboratory, July 2003)

Fisheries biologists collecting dead Chinook salmon in the Hanford Reach in an effort to evaluate the impact of fluctuations in flows. (Photographs: Courtesy of the Washington Department of Fish and Wildlife)

- Fall Chinook salmon fry prefer off-channel habitat with lower water velocity and slightly warmer water temperatures
- Chinook salmon over 60mm have a low susceptibility to stranding
- Juvenile Chinook salmon are most susceptible to flow fluctuations in the lower flow elevation <120 kcfs in the Hanford reach
- Juvenile Chinook salmon susceptibility to stranding/entrapment decreases at 400TU after the end of emergence
- Slight fluctuations during the critical period of susceptibility can result in significant mortality to fall Chinook salmon fry

Project 200202600 — *Morrow County Buffer Initiative*

2002-2003 Project Objectives

- Implement 40 new CCRP/CREP riparian buffer system agreements with participating landowners on 50 miles of streams to improve 1,000 riparian acres during the 3-year duration

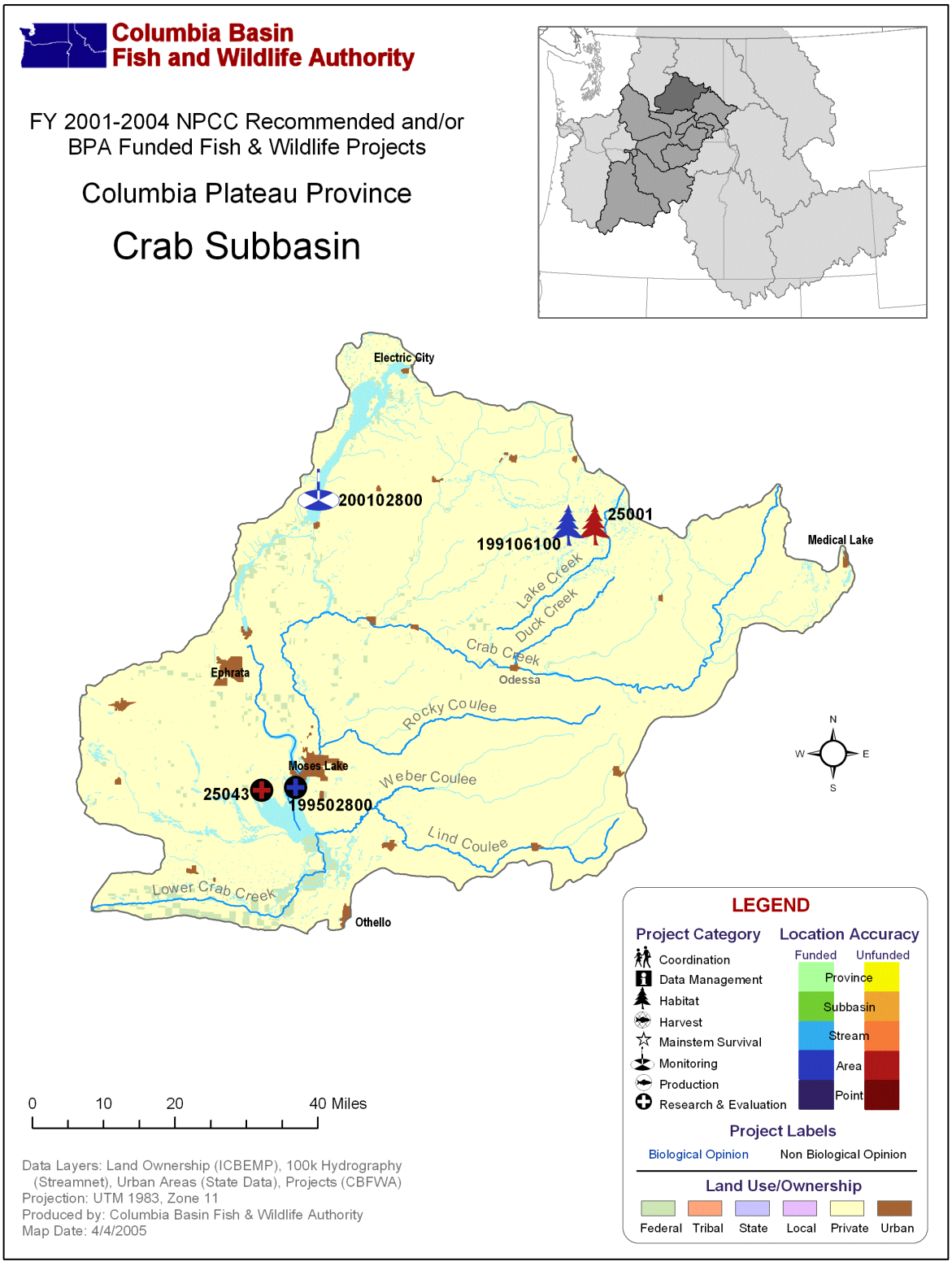
Preliminary Results

	Contracts negotiated	Stream miles enrolled	Acres protect
2002	4	3.6	47.9
2003	17	16.7	227.4
2004	13	17.9	324
Totals	34	38.2	599.3

	Contracts negotiated
Watering troughs	9
Fencing projects	12
Pipeline projects	6
Spring developments	6
Wildlife guzzlers	4

Fences, off-site water troughs, spring developments, pipelines, and wildlife guzzlers have been constructed throughout Morrow County to protect riparian areas. (Photographs: Courtesy of the Morrow County Soil and Water Conservation District)

Crab Subbasin

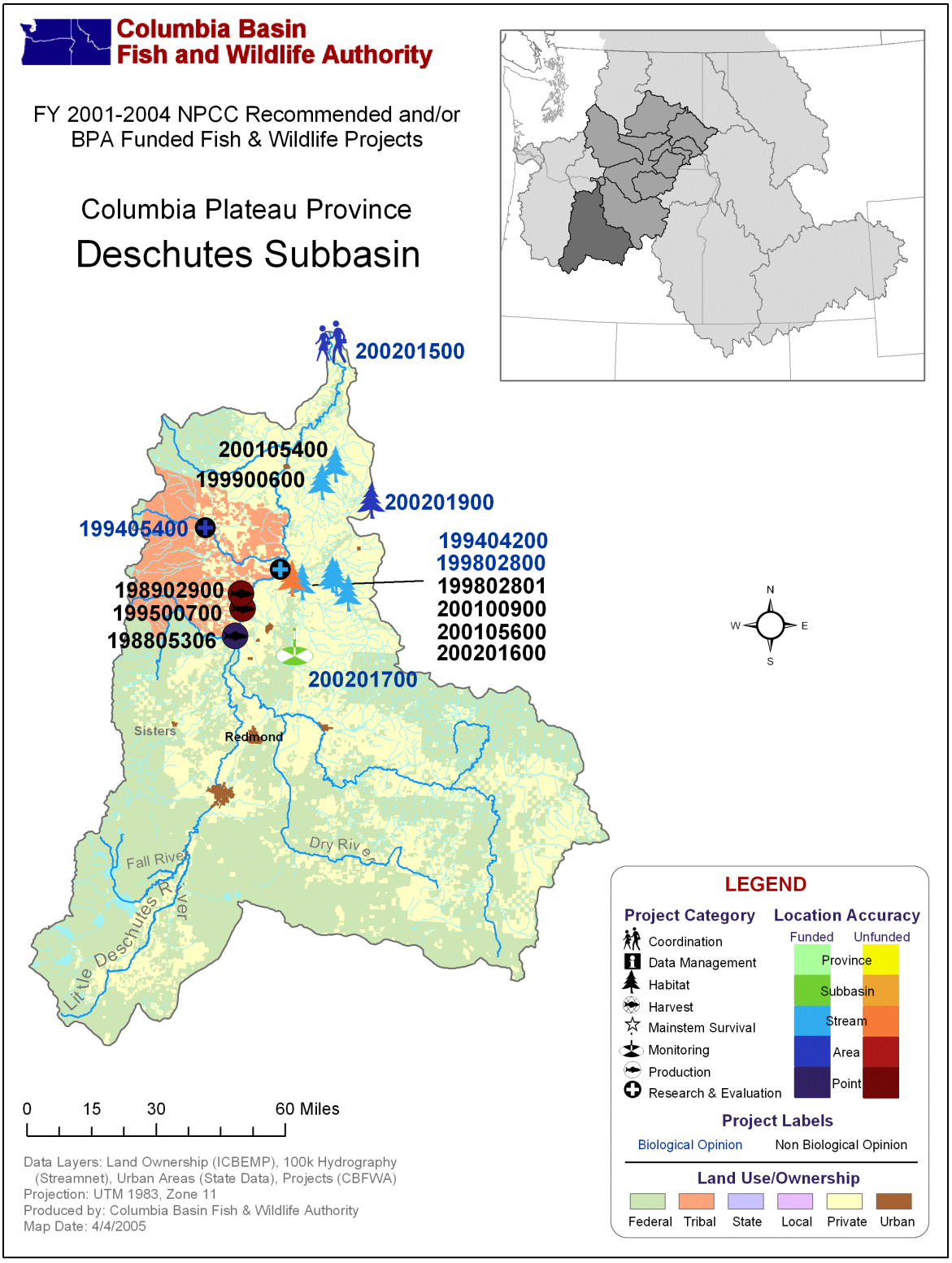


Projects in the Crab Subbasin

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
25001	Acquire Sharp-tailed Grouse Habitat at the Swanson Lakes Wildlife Area				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$300,000	$32,900	$ 0	Wildlife	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25043	Northern Leopard Frog Distribution and Habitat Association				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$41,754	$91,680	$ 0	Wildlife	Research & Evaluation	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
199106100	*Swanson Lakes Wildlife Area (SLWA)*				*Columbia Plateau*		*no*
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$255,921	$264,622	$273,619	$265,137	Wildlife	Habitat	area
BPA Spent	$256,733	$200,475	$53,044	$ 0			
199502800	*Restore Moses Lake Recreational Fishery*				*Intermountain*		*no*
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$213,072	$217,902	$222,702	$222,702	Resident	Research & Evaluation	area
BPA Spent	$372,800	$170,174	$336,686	$211,515			
200102800	*Evaluation of the Banks Lake Fishery*				*Intermountain*		*no*
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$170,408	$347,500	$340,000	$419,000	Resident	Monitoring	area
BPA Spent	$ 0	$147,350	$470,165	$384,328			

Projects in *italics* have preliminary results data included in Volume I.

Deschutes Subbasin



Projects in the Deschutes Subbasin

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
198805306	Hood River Production Program (HRPP): Hatchery O&M - Portland General Electric - Enron				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$150,871	$156,001	$161,305	Anadromous	Production	point
BPA Spent	$93,853	$166,280	$216,742	$174,177			
198902900	Hood River Production Program - Pelton Ladder - Hatchery				Columbia Gorge		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$139,534	$115,011	$137,520	$ 0	Anadromous	Production	point
BPA Spent	$ 0	$ 0	$ 0	$ 0			
199404200	**Trout Creek Habitat Restoration Project**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$358,846	$358,845	$371,046	$383,662	Anadromous	Habitat	stream
BPA Spent	$336,121	$419,797	$271,767	$328,001			
199405400	*Tools for Managing Bull Trout Populations Influenced by Nonnative Brook Trout Invasions*				*Columbia Plateau*		*yes*
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Resident	Research & Evalua-tion	area
BPA Spent	$16,333	$99,922	$86,045	$ 0			
199500700	Hood River Production - PGE: O&M				Columbia Gorge		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$46,300	$50,000	$54,000	$ 0	Anadromous	Production	point
BPA Spent	$ 0	$ 0	$ 0	$ 0			
199802800	Trout Creek Watershed Improvement Project				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$118,100	$122,115	$126,267	$130,560	Anadromous	Habitat	stream
BPA Spent	$81,625	$128,650	$123,065	$182,062			
199802801	Trout Creek Watershed Assessment				FY 2001 Ongoing		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$25,606	$68,982	$ 0	$ 0			

Projects in **bold** have preliminary results data included in this report. Projects in *italics* have preliminary results data included in Volume I.

Projects in the Deschutes Subbasin, continued...

Project ID	Project Title				Review Cycle		BiOp?
199900600	Bakeoven Riparian Assessment				FY 2001 Ongoing		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$80,000	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$48,321	$13,232	$126,856	$ 0			
200100900	Trout Creek Culvert Replacement				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$128,000	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$ 0	$ 0	$ 0	$ 0			
200105400	Supplement Flows in Buck Hollow Creek				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$22,826	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$15,624	$6,758	$ 0	$ 0			
200105600	Trout Creek 2001Streamflow Enhancement				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$133,500	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$ 0	$117,481	$ 0	$ 0			
200201500	Provide Coordination and Technical Assistance to Watershed Councils and Individuals in Sherman County, Oregon				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$71,000	$65,770	$68,337	Anadromous	Coordination	area
BPA Spent	$ 0	$2,424	$73,343	$59,110			
200201600	**Determine Lamprey Species Composition, Larval Distribution and Adult Abundance in the Deschutes Subbasin**				**Columbia Plateau**		**no**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$125,440	$107,971	$107,971	Anadromous	Research & Evaluation	stream
BPA Spent	$ 0	$ 0	$142,293	$82,117			
200201700	Regional Stream Conditions and Stressor Evaluation				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$80,000	$80,000	$80,000	Anadromous	Monitoring	subbasin
BPA Spent	$ 0	$ 0	$117,467	$18,817			
200201900	**Establish Riparian Buffer Systems**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$67,119	$67,218	$70,160	Anadromous	Habitat	area
BPA Spent	$ 0	$15,270	$56,398	$50,333			

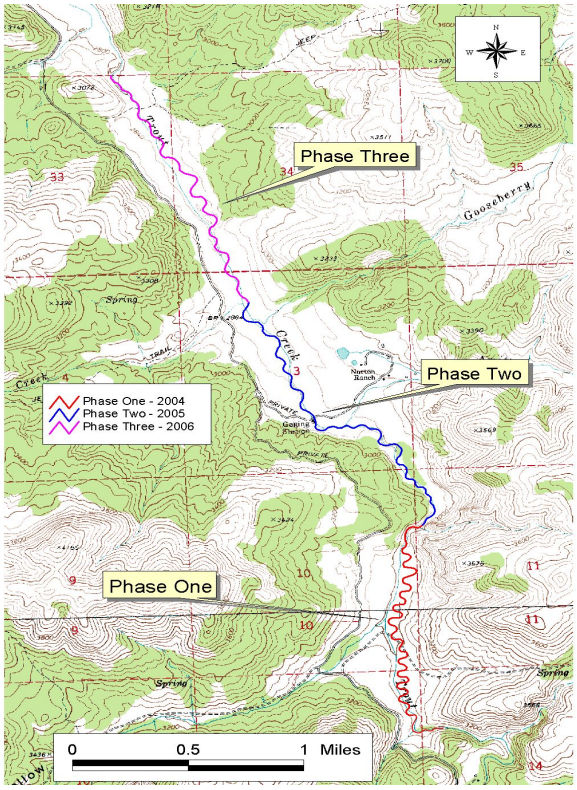
Projects in **bold** have preliminary results data included in this report.

Project 199404200 — *Trout Creek Habitat Restoration Project* and **Project 199802800** — *Trout Creek Watershed Improvement Project*

2002-2003 Project Objectives

- Increase instream habitat complexity, reduce bank instability, and increase riparian hardwood vegetative component

Trout Creek Habitat Improvement (Nye Property) — Preliminary Results



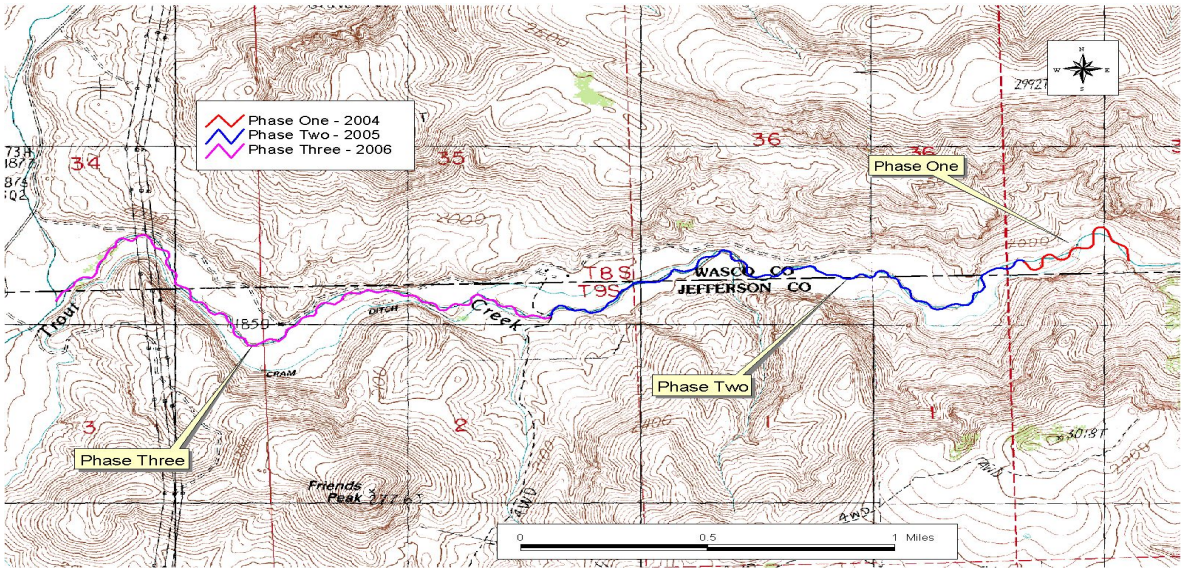
Trout Creek

- Increased stream length by 2,782 ft (40% increase)
- Average flood prone width increased by 190 ft (316% increase)
- Width/depth ration reduced by 57%
- Sinuosity for Reaches 2 and 3 increased by 59%

Boardhollow Creek

- Increased stream length by 233 ft (54% increase)
- Average flood prone width increased by 42 ft (525% increase)
- Width/depth ratio reduced by 40%
- Sinuosity increased by 25%

Lower Trout Creek Habitat Improvement (Priday Property) — Preliminary Results



- Stream length increased by 672 ft (34% increase)
- Average flood prone width increased by 160 ft (82% increase)
- Width/depth ratio decreased by 71%
- Sinuosity increased by 34%
-
- 0.4 surface acres of wetlands created

Project 200201600 — *Determine Lamprey Species Composition, Larval Distribution, and Adult Abundance in the Deschutes Subbasin*

2002-2003 Project Objectives

- Determine larval distribution and associated habitat
- Estimate the number outmigrants by developmental stage
- Estimate the escapement of adult lamprey and determine the harvest rates at Sherar's Falls

Larval Distribution and Associated Habitat—Preliminary Results

- 4 of 13 streams contained ammocoetes
- Larval lamprey were found only in the lowest reaches
- Habitat associates were weak; however, there was a relationship between lamprey presence and wood and depositional area

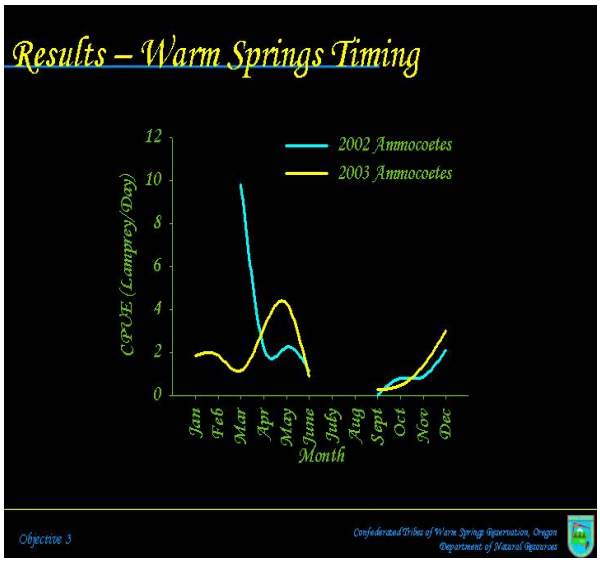
A total of 131 ammocoetes were found in the streams sampled by the Confederated Tribes of the Warm Springs Indian Reservation. (Photograph: Courtesy of the Confederated Tribes of the Warm Springs Indian Reservation)

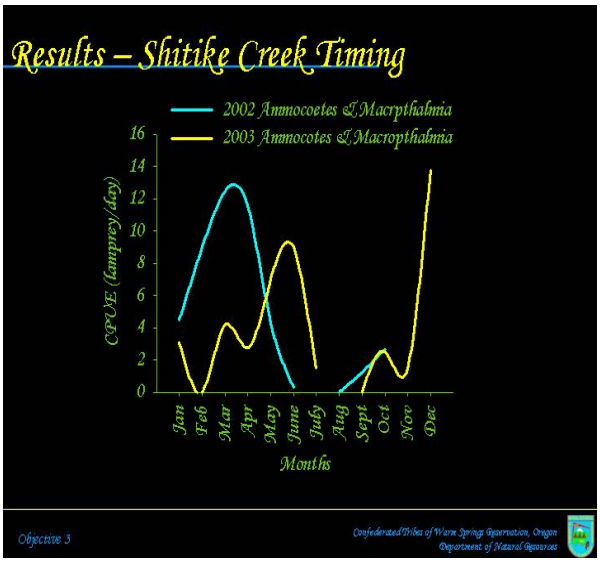
Outmigrant Estimates—Preliminary Results

	Warm Springs River	Shitike Creek
Days Operated	118	112
Days with lampreys present	81	84
Ammocoetes collected	262	336
Ammocoetes length range (mm)	49-134	44-126
Ammocoetes mean length (mm)	83.6	100.1
Macropthalmia collected	68	1
Macropthalmia length range (mm)	90-159	NA
Macropthalmia mean length (mm)	127.8	120

To estimate the number of outmigrating lampreys, the Confederated Tribes of the Warm Springs Indian Reservation of Oregon used screw traps to recapture previously marked fish. (Photograph: Courtesy of the Confederated Tribes of the Warm Springs Indian Reservation of Oregon)

Outmigrant Timing—Preliminary Results





Tribal Harvest—Preliminary Results

Creel Survey

- Conducted 21 interviews
- Caught 585 lamprey
- Estimated harvest of 960
- 9.25 lamprey/hour
- Mean length: 62 cm
- Range: 50-74 cm

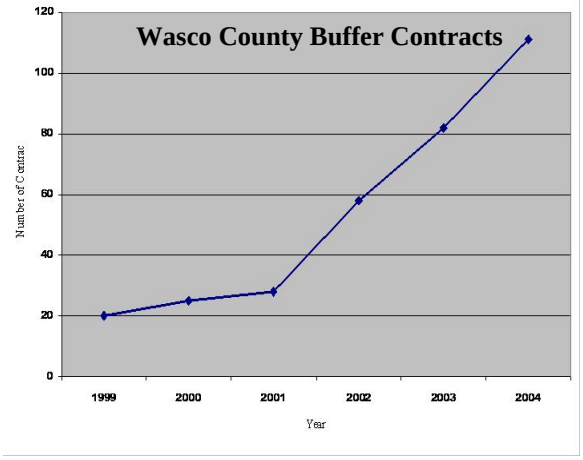
Tribal members of the Confederated Tribes of the Warm Springs Indian Reservation cleaning lampreys harvested from the Deschutes River Subbasin. (Photograph: Courtesy of the Confederated Tribes of the Warm Springs Indian Reservation of Oregon)

Project 200201900 — *Establish Riparian Buffer Systems*

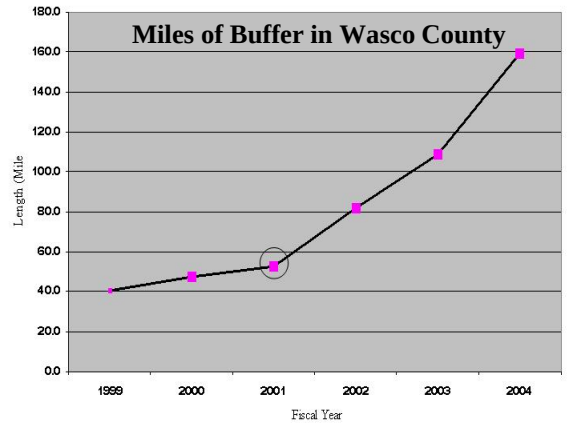
2002-2003 Project Objectives

- Implement 20 new CRP/CREP riparian buffer system agreements with participating landowners on 36 miles of stream to improve 800 riparian acres

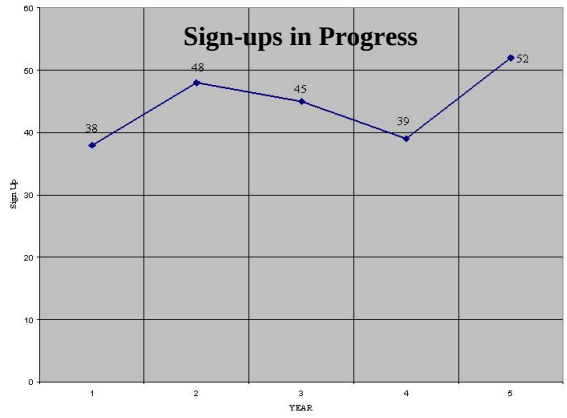
Preliminary Results



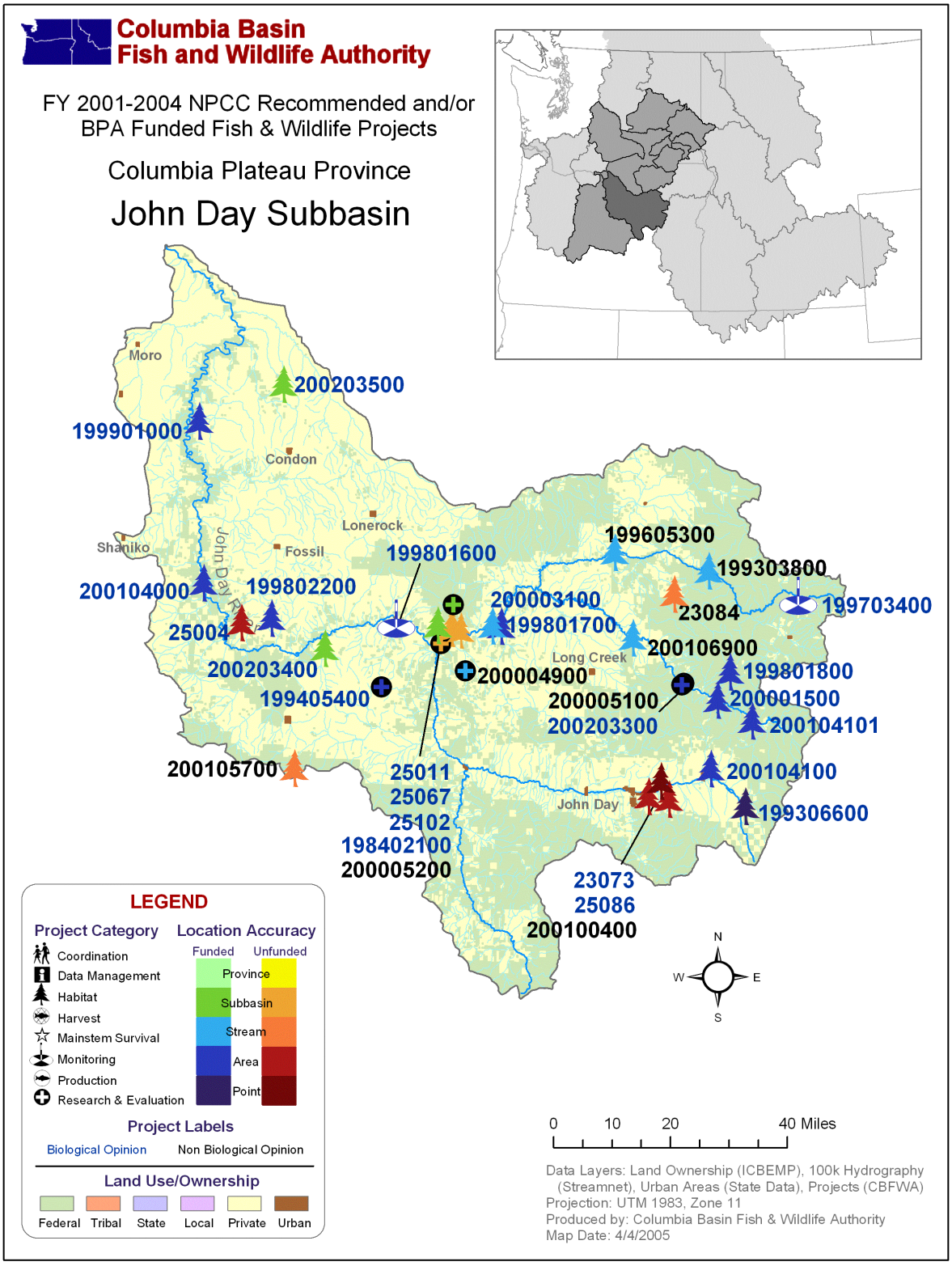
- By May 2004, 26 buffer contracts existed
- 36.6 miles of stream protected
- 1,248 acres covered



Members of the Farm Service Agency, Oregon Department of Fish and Wildlife, and the Wasco Soil and Water Conservation District touring protected acreage. (Photograph: Courtesy of the Wasco County Soil and Water Conservation District)



John Day Subbasin



Projects in the John Day Subbasin

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
23073	Purchase Perpetual Conservation Easement on Holliday Ranch and Crown Ranch Riparian Corridors and Uplands				FY 2001 High Priority		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$481,800	$ 0	$ 0	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
23084	Acquisition of Lower Desolation Creek, John Day Basin				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$4,987,754	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25004	Acquisition of Wagner Ranch				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$108,217	$35,000	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25011	Assess Riparian Condition Through Spectrometric Imaging Of Riparian Vegetation				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$175,000	$100,000	$ 0	Anadromous	Research & Evalua-tion	subbasin
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25067	Manage Water Distribution in the John Day Basin				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$251,261	$177,785	$ 0	Anadromous	Habitat	subbasin
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25086	Purchase Perpetual Conservation Easement on Holliday Ranch and Crown Ranch Riparian Corridors and Uplands				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$22,950	$12,900	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25102	Columbia Plateau Water Right Acquisition Program				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$149,368	$154,446	$ 0	Anadromous	Habitat	subbasin
BPA Spent	$ 0	$ 0	$ 0	$ 0			
198402100	**Protect and Enhance Anadromous Fish Habitat in The John Day Subbasin**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$439,936	$448,500	$463,749	$447,889	Anadromous	Habitat	subbasin
BPA Spent	$182,933	$295,866	$465,151	$365,013			

Projects in **bold** have preliminary results data included in this report.

Projects in the John Day Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
199303800	North Fork John Day Area Riparian Fencing				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$48,223	$10,896	$ 0	$ 0			
199306600	Oregon Fish Screening Project				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$641,621	$660,870	$680,696	$701,117	Anadromous	Habitat	point
BPA Spent	$360,247	$77,648	$517,064	$626,735			
199405400	*Tools for Managing Bull Trout Populations Influenced by Nonnative Brook Trout Invasions*				*Columbia Plateau*		*yes*
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$488,027	$489,174	$500,558	$490,750	Resident	Research & Evaluation	area
BPA Spent	$360,675	$369,736	$337,763	$402,367			
199605300	North Fork John Day Dredge Tailings Restoration Project				FY 2001 Ongoing		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$85,000	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$145,432	$48,827	$ 0	$ 0			
199703400	Monitoring Fine Sediment Grande Ronde and John Day Rivers				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$39,486	$40,829	$42,217	$ 0	Anadromous	Monitoring	area
BPA Spent	$48,207	$18,012	$22,456	$ 0			
199801600	**Monitor Natural Escapement & Productivity of John Day Basin Spring Chinook**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$157,057	$1,067,328	$1,059,648	$880,000	Anadromous	Monitoring	area
BPA Spent	$176,821	$154,490	$291,052	$689,504			
199801700	**Eliminate Gravel Push-up Dams in Lower North Fork John Day**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$95,100	$98,333	$101,677	$175,000	Anadromous	Habitat	area
BPA Spent	$47,426	$3,367	$4,764	$62,134			

Projects in **bold** have preliminary results data included in this report. Projects in *italics* have preliminary results data included in Volume I.

Projects in the John Day Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
199801800	John Day Watershed Restoration				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$432,350	$447,050	$462,250	$660,616	Anadromous	Habitat	area
BPA Spent	$291,677	$ 0	$534,437	$214,755			
199802200	*Pine Creek Ranch*				*Columbia Plateau*		*yes*
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$175,870	$172,000	$117,720	$121,722	Wildlife	Habitat	area
BPA Spent	$255,463	$91,077	$279,279	$102,207			
199901000	**Mitigate Effects of Runoff and Erosion on Salmonid Habitat in Pine Hollow and Jackknife**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$32,865	$21,980	$22,727	$34,500	Anadromous	Habitat	area
BPA Spent	$32,832	$ 0	$13,083	$ 933			
200001500	Oxbow Ranch Management and Implementation				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$1,782,546	$291,898	$110,715	$117,385	Anadromous	Habitat	area
BPA Spent	$ 0	$116,235	$127,275	$91,602			
200003100	**North Fork John Day River Subbasin Anadromous Fish Habitat Enhancement Project**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$221,205	$228,726	$236,503	$311,486	Anadromous	Habitat	stream
BPA Spent	$103,938	$359,073	$246,566	$202,856			
200004900	Diet, Distribution & Life History of Neomysis Mercedis in John Day Pool				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Research & Evaluation	stream
BPA Spent	$64,799	$41,562	$ 0	$ 0			
200005100	Research/Evaluation of NE Oregon Streams				FY 1999		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Research & Evaluation	area
BPA Spent	$109,325	$28,382	$5,216	$ 0			

Projects in **bold** have preliminary results data included in this report. Projects in *italics* have preliminary results data included in Volume I.

Projects in the John Day Subbasin, continued...

Project ID	Project Title				Review Cycle		BiOp?
200005200	Upstream Migration of Pacific Lampreys in the John Day River: Behavior, Timing, and Habitat Use				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$98,420	$271,956	$271,000	$ 0	Anadromous	Research & Evaluation	subbasin
BPA Spent	$136,157	$24,643	$1,244	$ 0			
200100400	Holliday Ranch Easement				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$5,026,800	$ 0	$ 0	$ 0	Anadromous	Habitat	point
BPA Spent	$ 0	$ 0	$ 0	$ 0			
200104000	Wagner Ranch Acquisition				FY 2001 High Priority		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$2,658,774	$ 0	$ 0	$ 0	Anadromous	Habitat	area
BPA Spent	$2,589,449	$7,616	$ 0	$ 0			
200104100	Forrest Ranch Acquisition				FY 2001 High Priority		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$4,184,185	$ 0	$ 0	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$3,936,444	$ 0	$ 0			
200104101	Forrest Ranch Acquisition				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$169,851	$155,715	$146,635	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$37,316	$127,240			
200105700	Badger Creek Culvert Replacement and Road Closure Projects (23020)				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$87,000	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$ 0	$ 0	$ 0	$ 0			
200106900	John Day Basin Streamflow Enhancement Project, Summer 2001				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$73,340	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$ 0	$73,340	$ 0	$ 0			

Projects in the John Day Subbasin, continued...

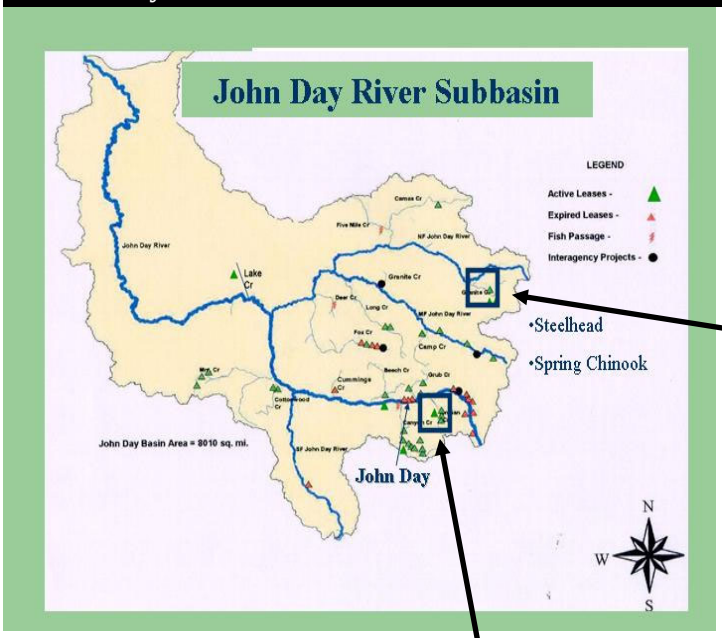
Project ID	*Project Title*				*Review Cycle*		*BiOp?*
200203300	John Day Salmonid Recovery Monitoring Program				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$164,133	$59,150	$124,503	Anadromous	Research & Evaluation	area
BPA Spent	$ 0	$ 0	$20,384	$110,282			
200203400	Wheeler SWCD Riparian Buffer Planning and Implementation				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$75,086	$77,337	$79,657	Anadromous	Habitat	county
BPA Spent	$ 0	$ 0	$81,914	$59,198			
200203500	Gilliam SWCD Riparian Buffers				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$75,086	$77,337	$79,657	Anadromous	Habitat	county
BPA Spent	$ 0	$7,806	$82,086	$64,395			

Project 198402100 — *Protect and Enhance Fish Habitat in the John Day Subbasin* and
Project 198402500 *—John Day Basin Fish Habitat Enhancement Project**

2002-2003 Project Objectives

- Improve stream channel function, instream habitat diversity, and streambank stability by constructing bio-engineering treatments, instream structures, and placing large wood
- Improve the quantity and quality of riparian communities along the John Day River and tributaries

Preliminary Results



Granite Creek

Prior to restoration efforts, Granite Creek riparian areas were composed of dredge mine tailings (material inside circle) which subsequently confined the stream channel and restricted channel function. To eliminate the confinement and restore floodplain function, biologists removed the tailings. (Photographs: Courtesy of Confederated Tribes of the Umatilla Indian Reservation)

Indian Creek

To prevent additional erosion along a steep, exposed bank (area inside circle), biologists used junipers to protect the bank and provide rearing habitat for juvenile salmonids in Indian Creek. (Photographs: Courtesy of Confederated Tribes of the Umatilla Indian Reservation)

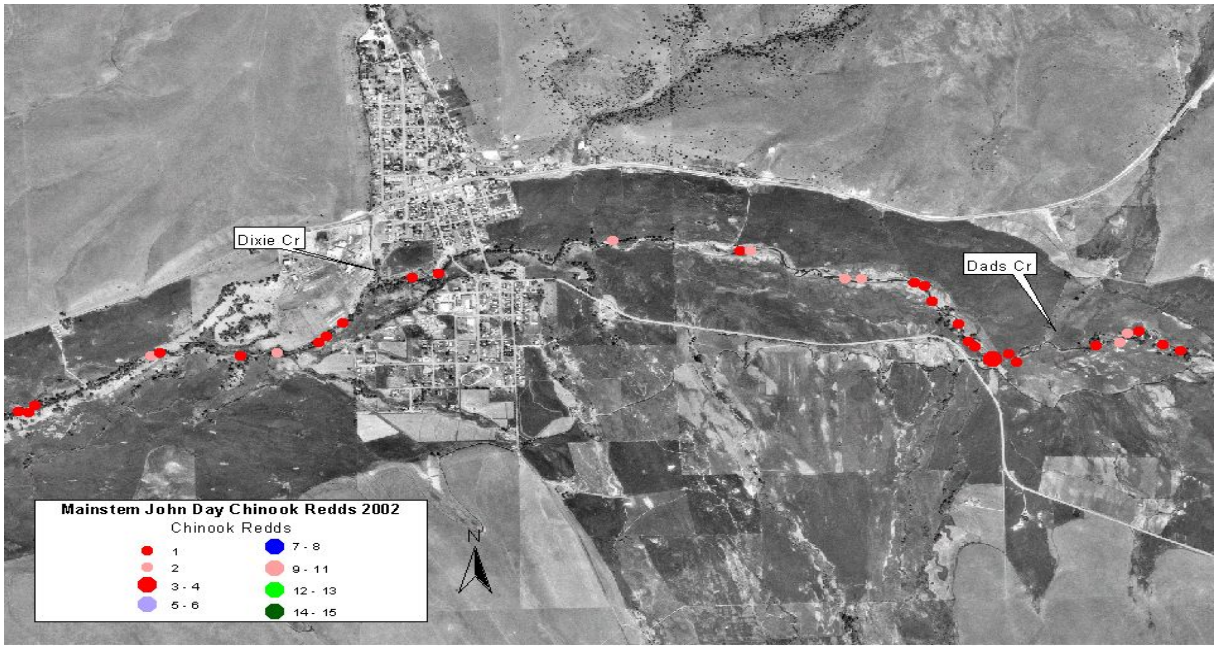
* Funding information for 198402500 located in Blue Mountain, Grande Ronde section.

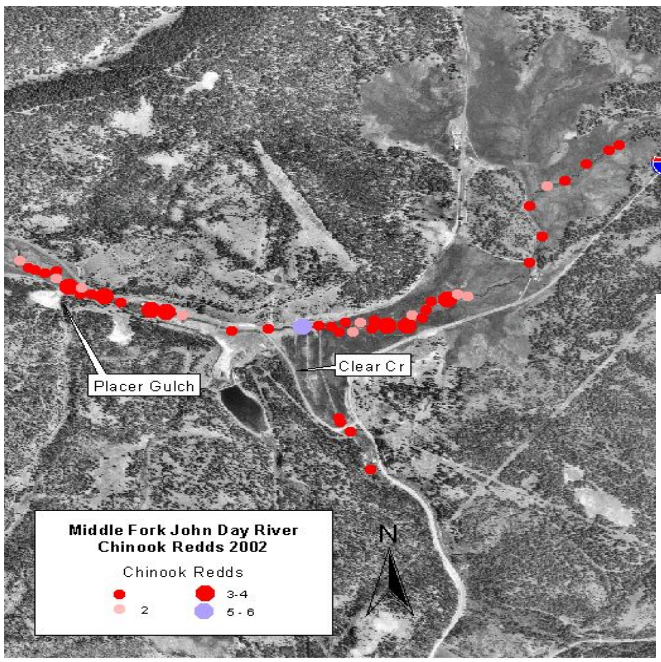
Project 199801600 —*Monitor Natural Escapement and Productivity of John Day Basin Spring Chinook*

2002-2003 Project Objectives

- Estimate total number and distribution of spring Chinook salmon spawners returning to the John Day River subbasin
- Estimate smolt-to-adult survival rates of spring Chinook salmon
- Estimate basinwide abundance of spring Chinook salmon smolts and contributions of subbasins to total smolt production

Chinook Salmon Spawning Surveys—Preliminary Results





Spring Chinook Escapement

Number of Redds

Year	North Fork	Middle Fork	Mainstem	Total	Escapement
2000	929	569	381	1,879	5,637
2001	1,077	354	432	1,863	5,589
2002	1,057	391	507	1,955	5,865
2003	858	236	323	1,417	4,251

Chinook Salmon Smolt Production—Preliminary Results

Spring Chinook Smolt-to-Adult Returns

Cohort	Tag Year	# tagged	# Returning Adults			SAR
			Age 3	Age 4	Age 5	
1998	2000	1,852	4	112	28	7.8%
1999	2001	3,893	7	80	15	2.6%
2000	2002	4,000	5	86		
2001	2003	6,147	5			
2002	2004	4,017				

Smolt Production

Year	Abundance	95% CL's
2001	92,922	79,258-111,228
2002	103,097	90,280-119,774
2003	83,394	76,739-91,734

Chinook salmon smolts are collected by seining (above) and traps. Smolts are PIT tagged to aid in evaluating smolt-to-adult returns. (Photographs: Courtesy of the Oregon Department of Fish and Wildlife)

Project 199801700 — *Eliminate Gravel Push-up Dams in Lower North Fork John Day*

2002-2003 Project Objectives

- Eliminate gravel push-up dams in the Lower North Fork John Day River and replace with permanent pumping stations resulting in the removal of passage impediments

Preliminary Results

Using heavy equipment (right), irrigators push up streambed gravels to create tributary (right), cross-channel, (middle), and side-channel "push-up" dams for the purpose of creating deep pools for irrigation withdrawals in the Lower North Fork John Day River. (Photographs: Courtesy of the North Fork John Day Watershed Council and the Monument Soil and Water Conservation District)

A push-up dam (top) in the Lower North Fork John Day River that was a passage barrier prior to being removed in August 2004 (bottom). (Photograph: Courtesy of the North Fork John Day Watershed Council and the Monument Soil and Water Conservation District)

- When the project started there were about 30 regularly maintained push-up dams in the project area.
- Four push-up dams replaced between 1998 and 2000 (permanent pump stations were installed at new pump sites)
- Four push-up dams replaced in August 2004 with another 6-9 scheduled for replacement by September 2005

Project 199901000 — *Mitigate Effects of Runoff and Erosion on Salmonid Habitat in Pine Hollow and Jackknife Watersheds*

2002-2003 Project Objectives

- Implement practices associated with farming and grazing management plans

Preliminary Results

- 31 water and sediment control basins created to reduce the sediment load reaching tributaries
- 28,485 feet of fence installed
- 305 acres of range cleared of brush and reseeded with grasses
- 9 water developments completed to provide off-stream water for cattle

To reduce sediment (left) from entering tributaries in the Pine Hollow watershed, sediment control basins (right) have been created in the uplands. (Photographs: Courtesy of the Sherman County Soil and Water Conservation District)

In an attempt to create an environment suitable for native grasses in the Pine Hollow watershed, juniper and sage brush (upper left) were removed from 305 acres and the range was seeded with native grasses (lower left). Fences are used throughout the watershed to promote improved range management and protection. (Photographs: Courtesy of the Sherman County Soil and Water Conservation District)

Project 200003100 — *North Fork John Day River Subbasin Anadromous Fish Habitat Enhancement Project*

2002-2003 Project Objectives

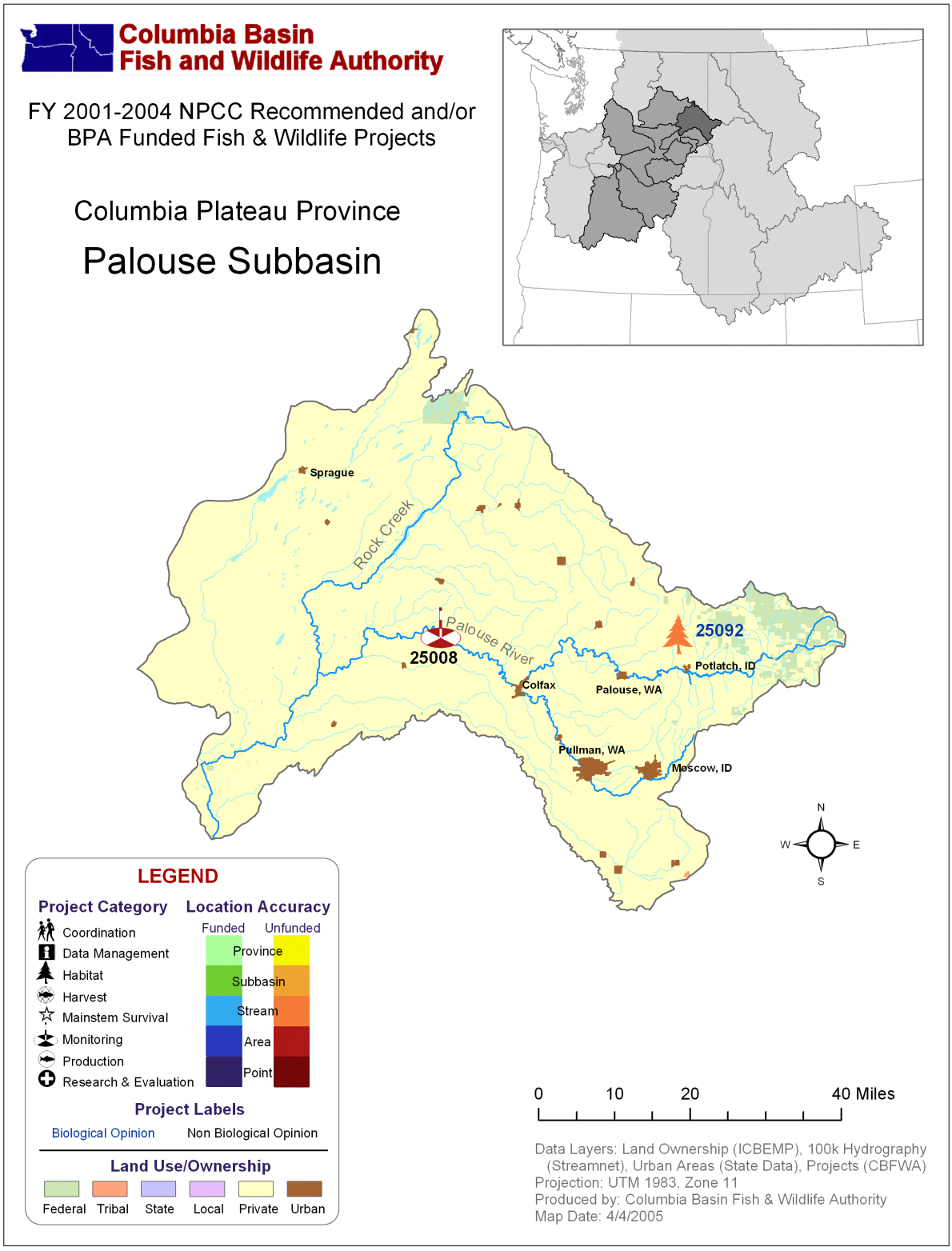
- Implement passive, natural recovery approaches in combination with intensive native revegetation efforts to achieve anadromous fish habitat recovery

Preliminary Results

Fencing (left), planting of native grasses (upper right), and off-site water sources (lower right), are used by the Confederated Tribes of the Umatilla Indian Reservation to restore and protect riparian areas. (Photographs: Courtesy of the Confederated Tribes of the Umatilla Indian Reservation)

- Five riparian easements secured for the enhancement of 7.75 stream miles of tributary habitat within Deer (3.7 stream miles), Owens (.25 miles), and Snipe (4 miles) creeks
- Constructed 14.2 miles of riparian livestock exclusion fencing
- Treated approximately 95 acres of noxious weeds with herbicides
- Revegetated riparian areas with approximately 20,150 trees and shrubs and 400 pounds of native grasses
- Constructed 10 off-stream livestock watering sites
- Redeveloped three existing water wells and drilled one

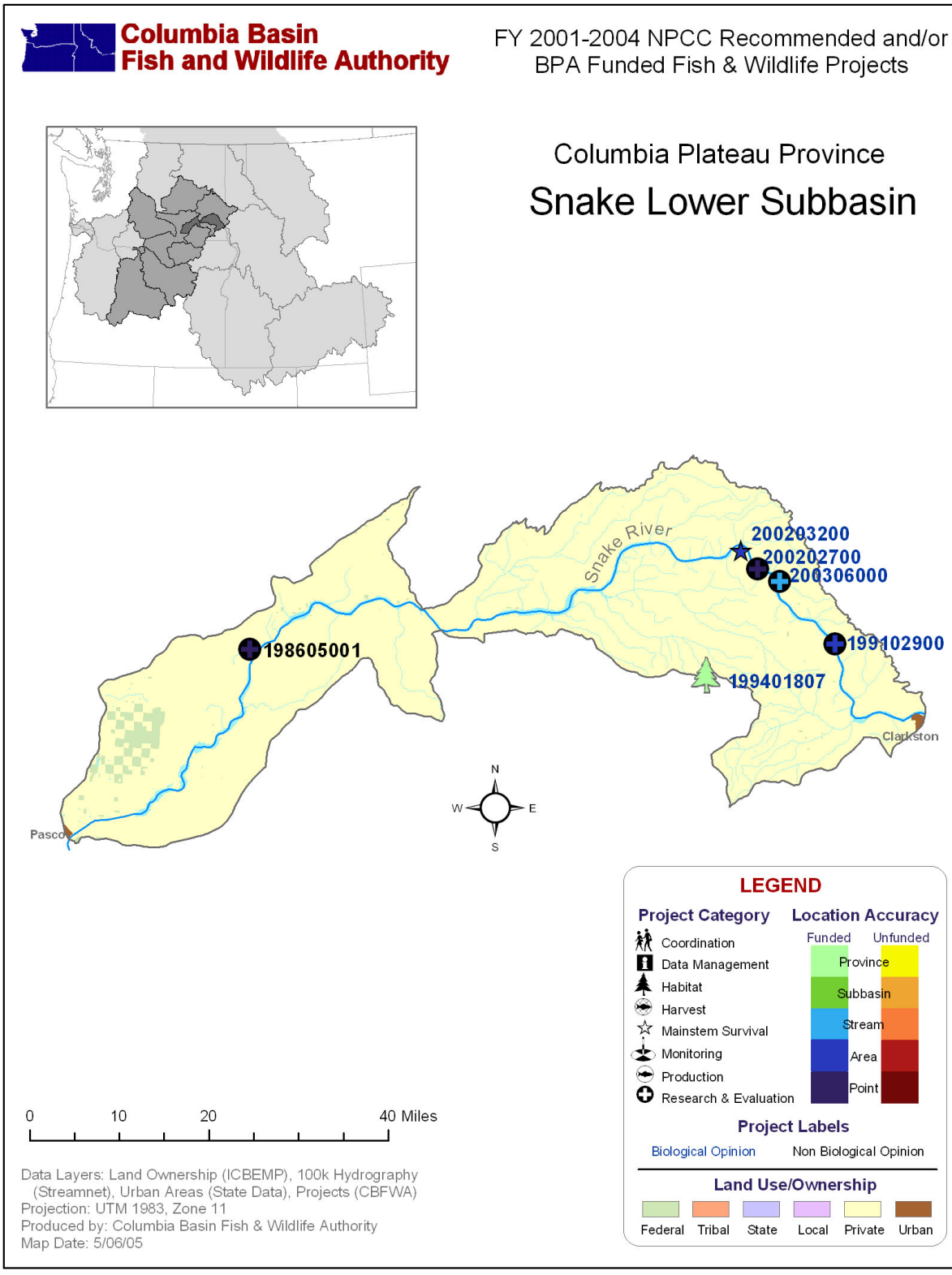
Palouse Subbasin



Projects in the Palouse Subbasin

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
25008	Resident Fish Stock Status in the Palouse River and Upper Crab Creek Watersheds, Washington				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$546,670	$472,203	$ 0	Resident	Monitoring	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25092	Restoration of Healthy Watershed to Palouse River Drainage in Idaho				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$100,200	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$ 0	$ 0	$ 0	$ 0			

Snake Lower Subbasin



Projects in the Snake Lower Subbasin

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
198605001	Evaluation of Rebuilding The Sturgeon Population in the Snake River				FY 1998		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Resident	Research & Evaluation	point
BPA Spent	$44,862	$473,339	$214,856	($5,037)			
199102900	**Understanding the effects of summer flow augmentation on the migratory behavior and survival of fall chinook salmon migrating through L Granite Res.**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$699,000	$630,375	$610,375	$610,375	Anadromous	Research & Evaluation	area
BPA Spent	$802,258	$1,171,291	$600,501	$551,696			
199401807	**Garfield County Sediment Reduction and Riparian Improvement Program**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$123,700	$80,000	$80,000	$39,803	Anadromous	Habitat	county
BPA Spent	$128,639	$75,787	$63,018	$41,815			
200202700	**Numerically Simulating the Hydrodynamic and Water Quality Environment for Migrating Salmon in the Lower Snake River**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$207,360	$183,322	$107,917	Anadromous	Research & Evaluation	point
BPA Spent	$ 0	$97,994	$213,020	$86,425			
200203200	**Investigating passage of ESA-listed juvenile fall chinook salmon at Lower Granite Dam during winter when the fish bypass system is inoperable**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$176,000	$131,000	$131,000	Anadromous	Mainstem Survival	area
BPA Spent	$ 0	$ 0	$163,307	$173,148			
200306000	Evaluating the Relative Reproductive Success of Natural- and Hatchery-Origin Snake River Fall Chinook Spawners Upstream of Lower Granite Dam				FY 2003 RFS		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Research & Evaluation	stream
BPA Spent	$ 0	$ 0	$ 0	$46,149			

Projects in **bold** have preliminary results data included in this report.

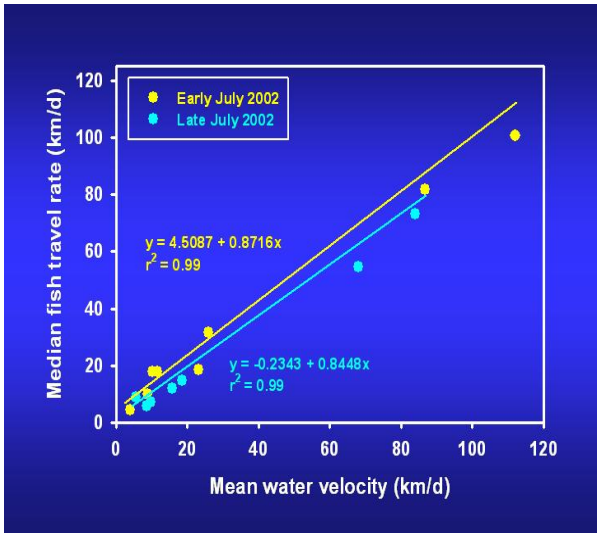
Project 199102900 — *Understanding the Effects of Summer Flow Augmentation on the Migratory Behavior and Survival of Fall Chinook Salmon Migrating through Lower Granite Reservoir*

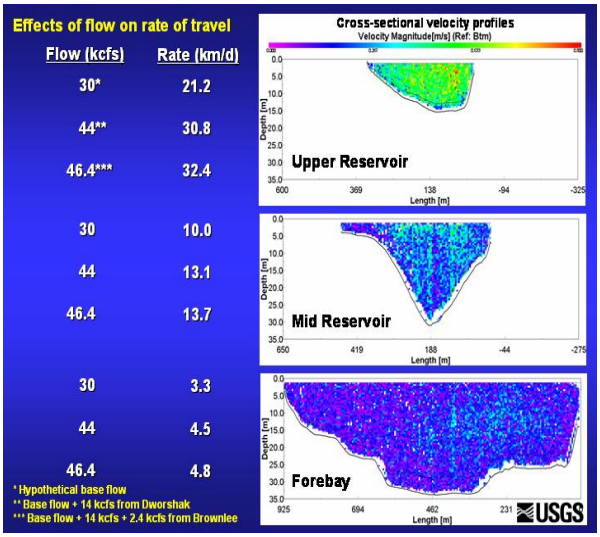
2002-2003 Project Objectives

- Understand the relations between flow, water velocity, and juvenile fall Chinook salmon rates of travel in riverine and impounded haitat
- Understand the effects of flow and temperature on juvenile fall Chinook salmon survival

Flows and Water Velocity — Preliminary Results

- Incremental decreases in flow decrease velocity which decreases rate of travel especially in upper reservoir reaches, but to much lower extent in forebays

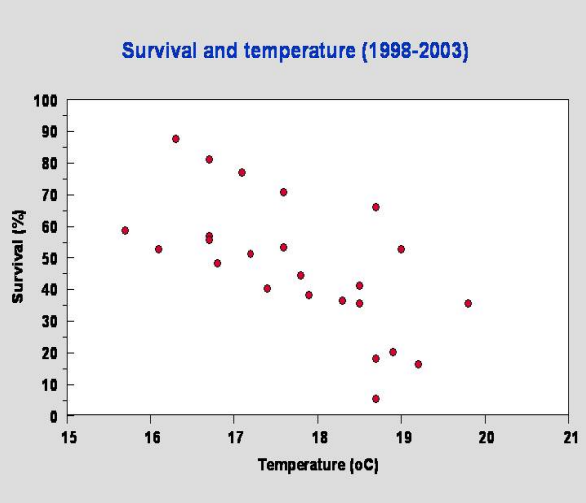


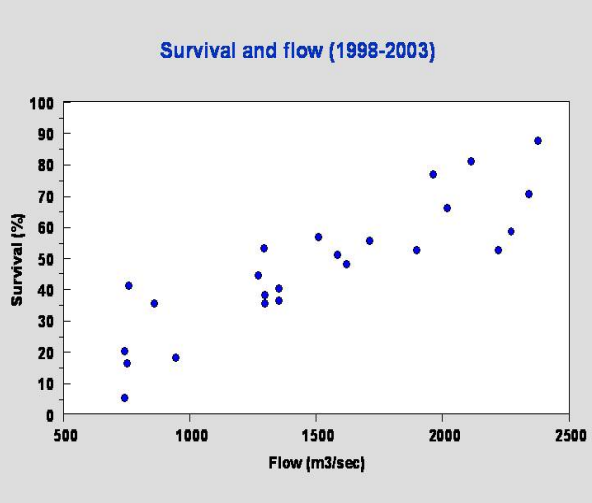


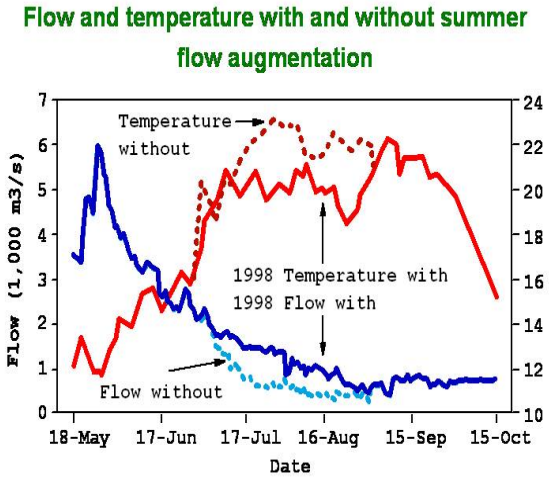
Photograph: Courtesy of the U.S. Fish and Wildlife Service

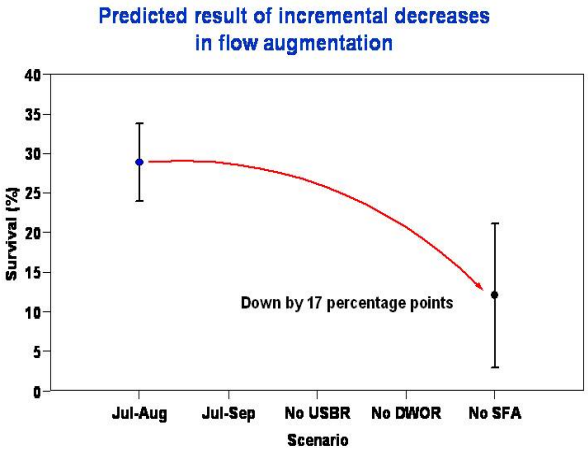
Flow and Temperature — Preliminary Results

- Incremental decreases in flow (hence velocity) accompanied by incremental increases in temperature likely reduce survival









Project 199401807 — *Garfield County Sediment Reduction and Riparian Improvement Program*

2002-2003 Project Objectives

- Reduce sediment deposition into streams
- Improve water quality by removing livestock from riparian areas

Preliminary Results

To eliminate fallow-related erosion (left), no-till direct seed cropping (right) is used by farmers throughout Garfield Count, WA. (Photographs: Courtesy of the Pomeroy Soil and Water Conservation District)

- No– till/direct seed cropping systems are now used by 66% of the farmers in the Pomeroy Conservation District
- 25,000 acres managed using no-till seeding (2001-2003)
- 1,003 acres currently enrolled in CREP (three separate streams protected)

Three streams and over 1,003 acres are currently protected by fences in Garfield County. Offsite sources of water are provide as compensation for prohibiting cattle from entering the riparian areas. (Photographs: Courtesy of the Pomeroy Soil and Water Conservation District)

Project 200202700 — *Numerically Simulating the Hydrodynamic and Water Quality Environment for Migrating Salmon in the Lower Snake River*

2002-2003 Project Objectives

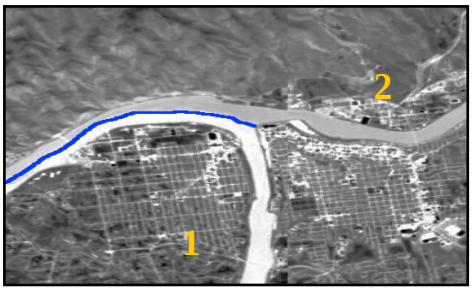
- Describe the stratified three-dimensional water temperature structure in LGR and two-dimensional (i.e. depth averaged) water temperature variations below LGR using numerical models
- Describe the three-dimensional water current structure in LGR and two-dimensional depth-averaged water velocity variations below LGR using transient numerical models

Water Temperature—Preliminary Results

Upstream Snake (1)
Temperature: 7.4°C
Discharge: 829 m3/s

Clearwater (2)
Temperature: 5.8°C
Discharge: 746 m3/s

Temperature delta: 1.6°C
S/C Discharge ratio: 1.1
(~equal Q and T)



Mode 1: April 4, 2003

Upstream Snake
Temperature: 13.5°C
Discharge: 1697 m3/s

Clearwater
Temperature: 10.0°C
Discharge: 1215 m3/s

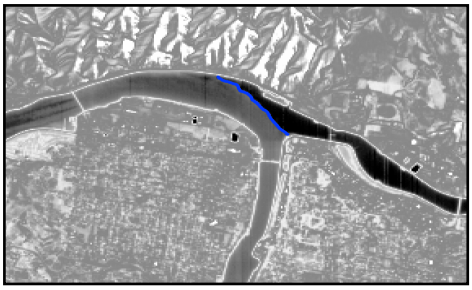
Temperature delta: 3.5°C
S/C Discharge ratio: 1.4
(high Q ratio, temp ~equal)

Mode 2: May 23, 2003

Upstream Snake
Temperature: 22.7°C
Discharge: 446 m3/s

Clearwater
Temperature: 13.4°C
Discharge: 479 m3/s

Temperature delta: 9.3°C
S/C Discharge ratio: 0.9
(large temp delta, Q ~equal)

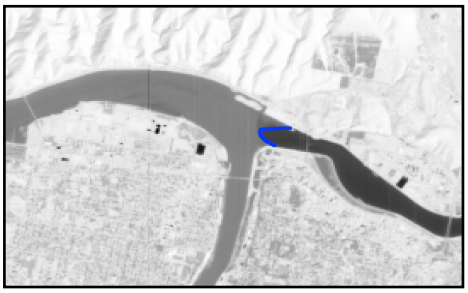


Mode 3: July 21, 2003

Upstream Snake
Temperature: 23.3°C
Discharge: 473 m3/s

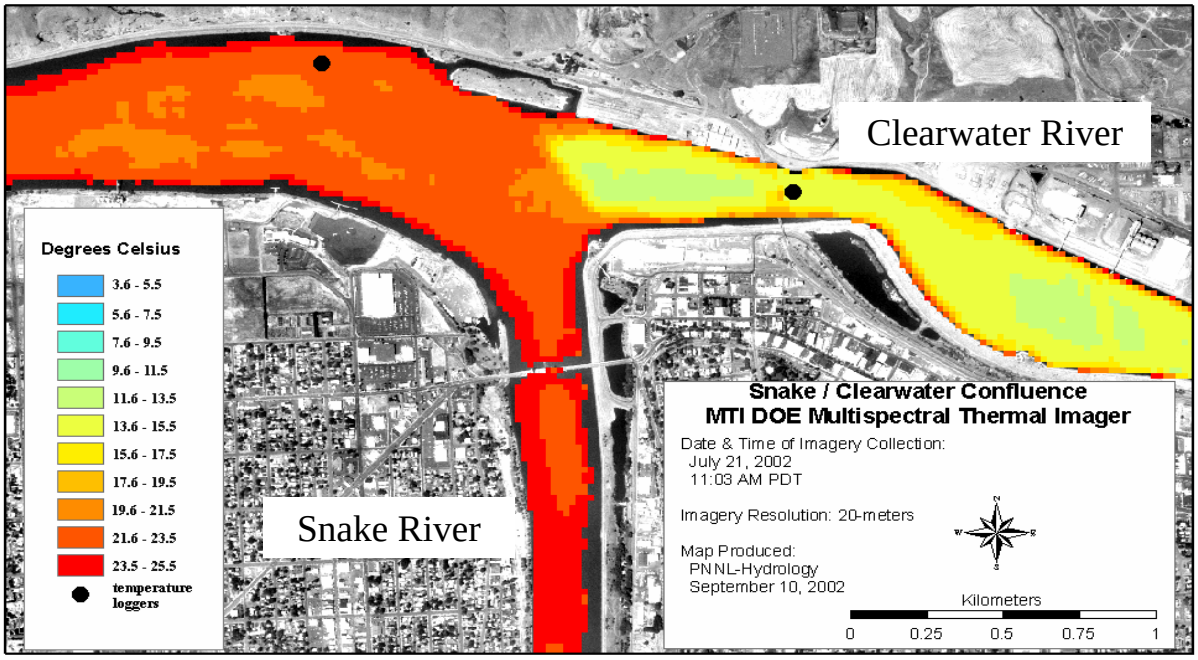
Clearwater
Temperature: 11.3°C
Discharge: 386 m3/s

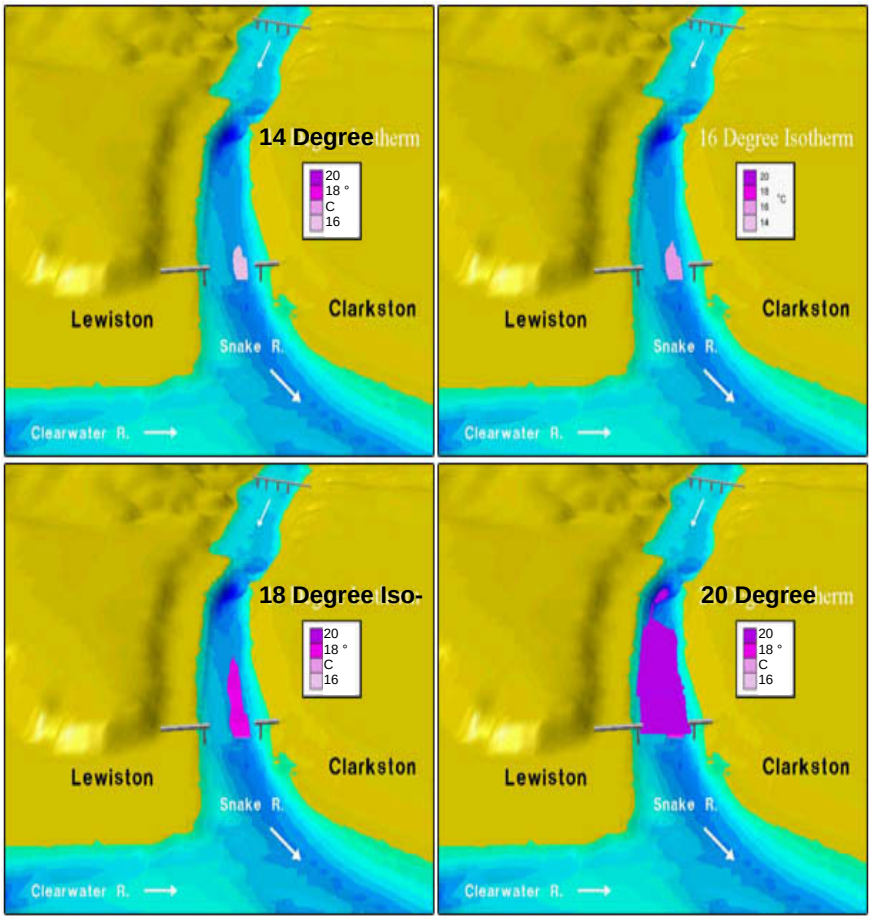
Temperature delta: 11°C
S/C Discharge ratio: 1.2
(Larger Snake, large T delta)



Mode 4: July 30, 2003

Water Temperature—Preliminary Results Continued





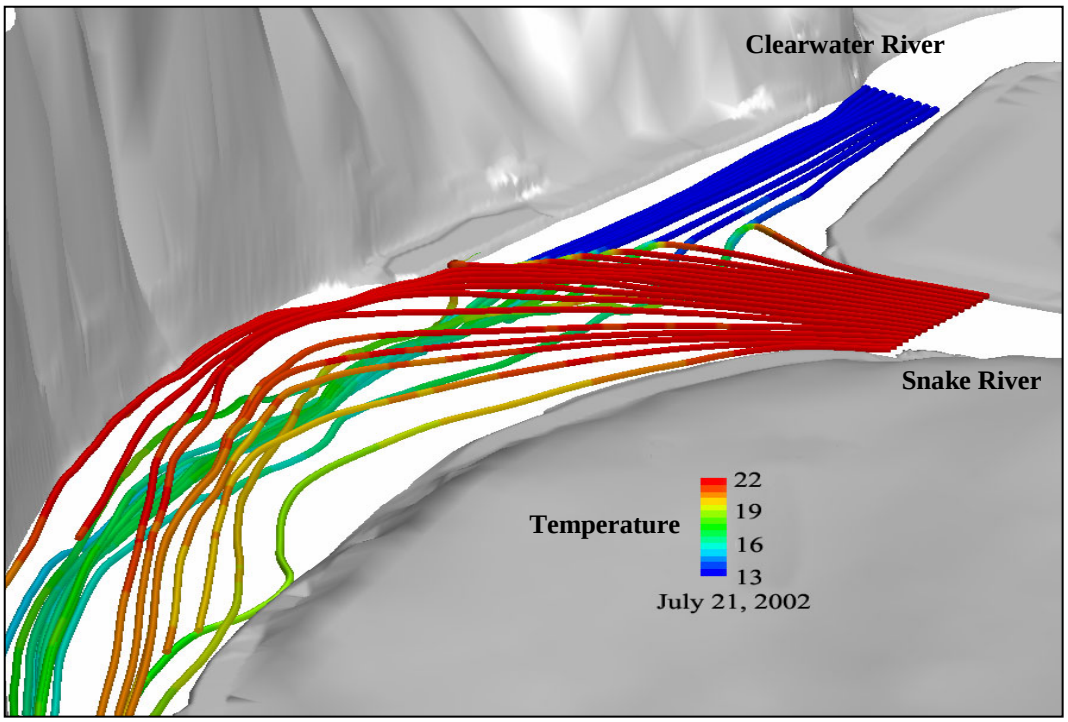
Typical Pattern
Water from the Clearwater River subducts under the water from the Snake River

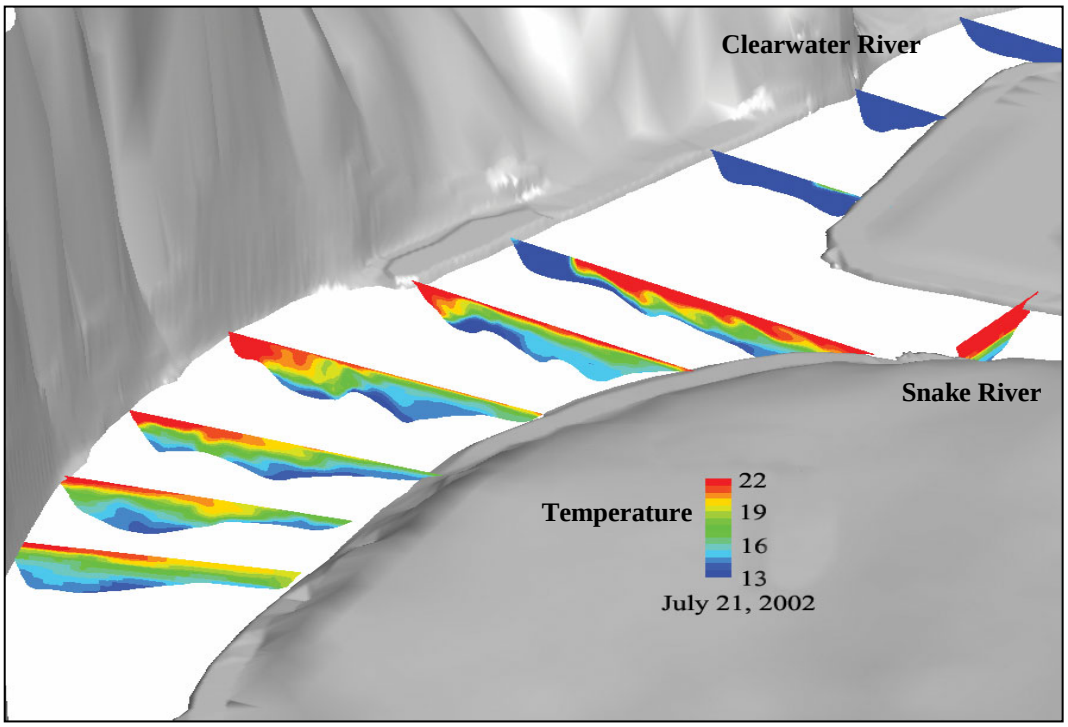
Density Driven Flow

- Colder water from the Clearwater River flowed "upstream" along the bottom of the snake River
- 'Upstream" motion of the water halted when a balance of momentum was reached

Water Currents—Preliminary Results Continued

- Circulation dynamics at the confluence of the Snake and Clearwater rivers is determined by discharge and density (primarily a function of temperature at this location)





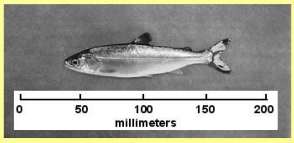
Project 200203200 — *Investigating Passage of ESA-Listed Juvenile Fall Chinook Salmon at Lower Granite Dam during Winter when the Fish Bypass System is Inoperable*

2002-2003 Project Objectives

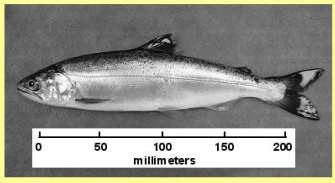
- Assess the importance of the holdover strategy to adult returns to the Snake river
- Determine if holdover wild fall Chinook salmon smolts pass Lower Granite Dam during the winter when the fish bypass systems are shut down

Holdover Strategy — Preliminary Results

Results of Analyses on Juveniles

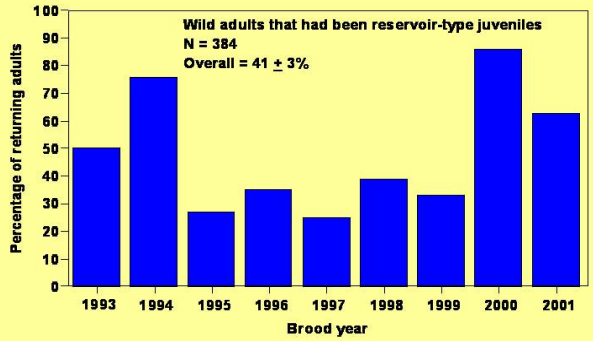


Ocean-type
Wild, N = 47, FL = 139, K = 1.2
Hatchery, N = 1,162, Fl = 112, K = 1.2

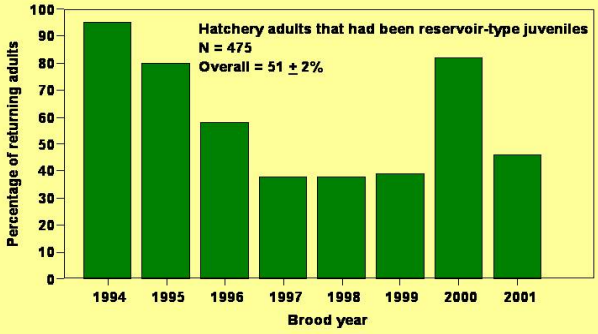


Reservoir-type
Wild, N = 38, FL = 222, K = 1.1
Hatchery, N = 42, Fl = 224, K = 1.1

Results of analyses on wild adults (6 return years representing 11 brood years)



Results of analyses on hatchery adults (6 return years representing 10 brood years)

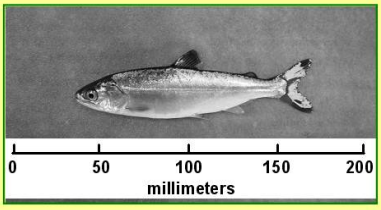


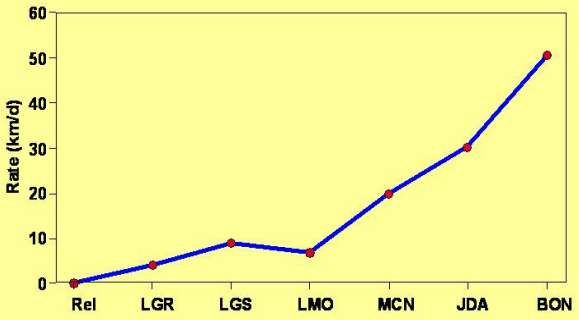
- Overall average of 41% of the wild adults and 51% of the hatchery adults in samples of spawners collected at Lower Granite Dam were reservoir-type juveniles
- Some Fall Chinook salmon juveniles in the Snake River basin spend their first winter in a reservoir and resume seaward movement the following spring at Age-1

Ocean-type Juveniles — Preliminary Results

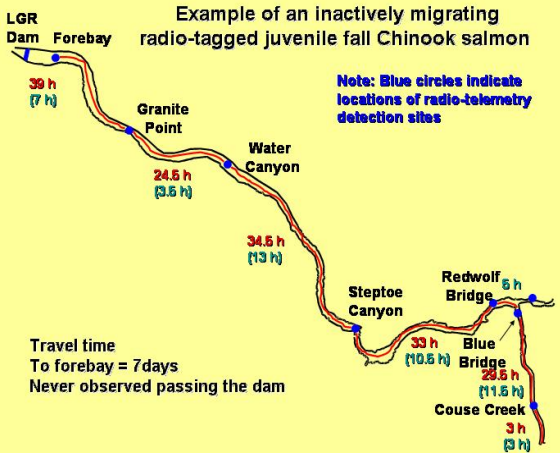
Ocean-type Juveniles

1) Discontinuous shoreline rearing
2) Rapid dispersal into LGR reservoir
3) Discontinuous downstream dispersal
4) Active seaward movement



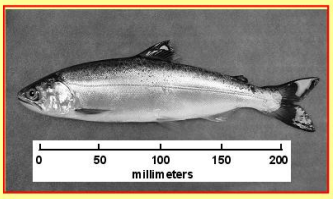


Reservoir-type Juveniles — Preliminary Results

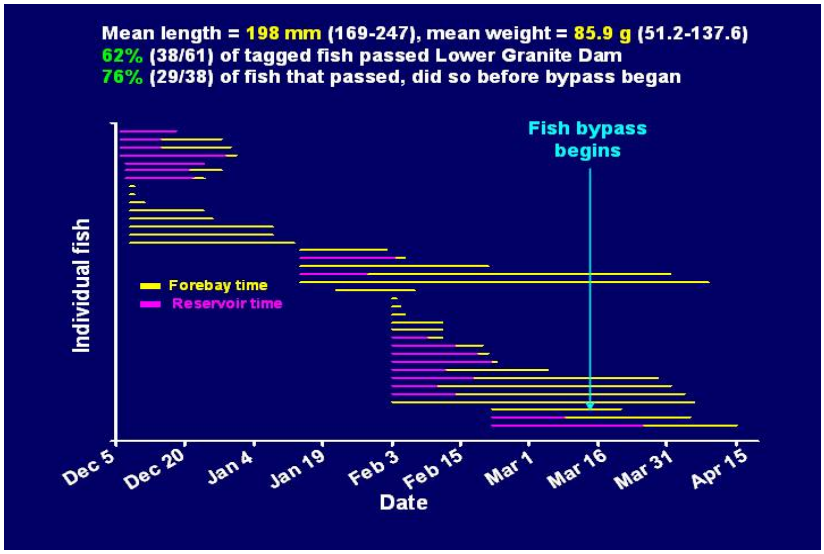


Speculative Details on Reservoir-type Juveniles

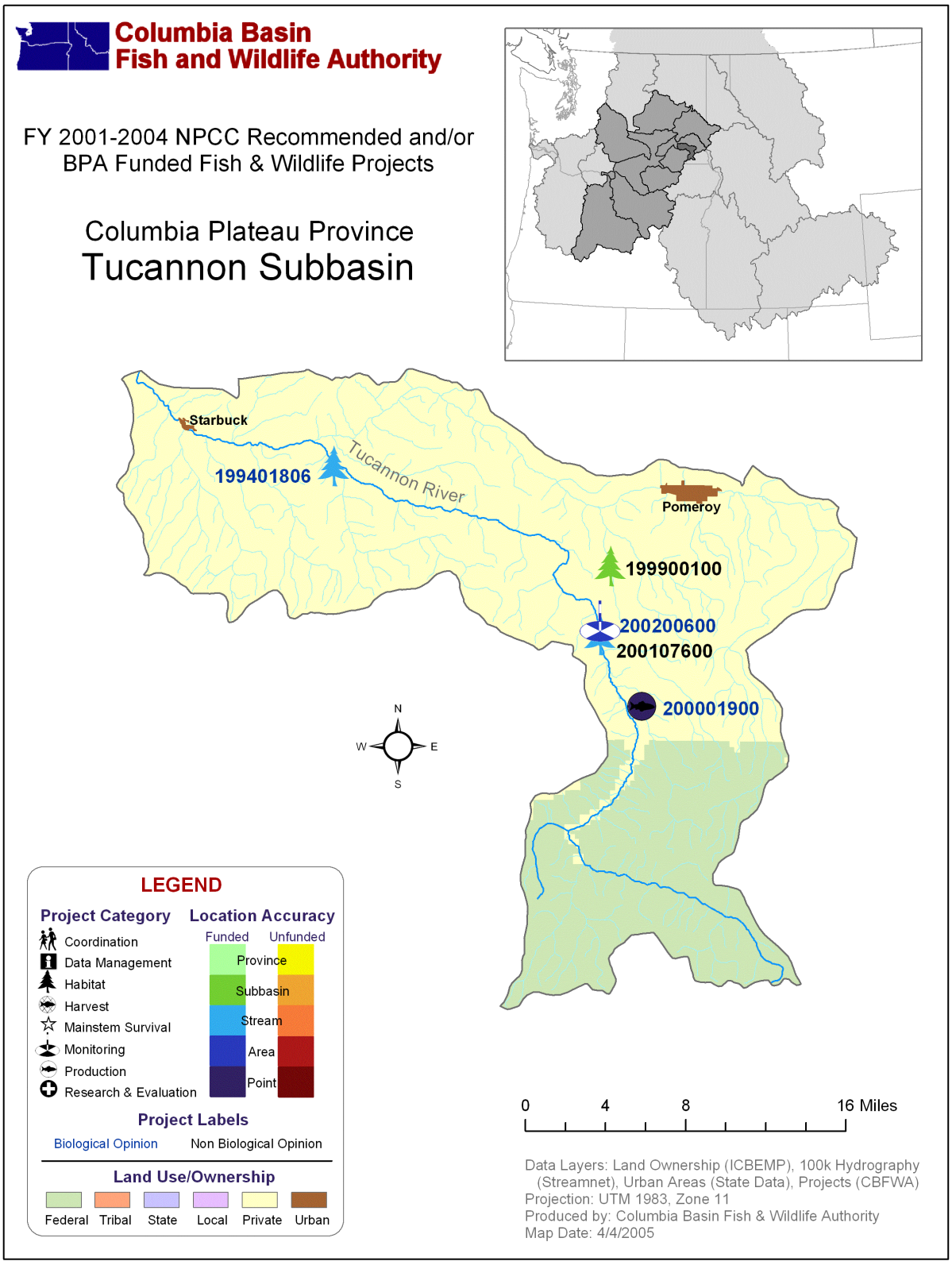
1) Discontinuous shoreline rearing
2) Rapid dispersal into LGR reservoir
3) Discontinuous downstream dispersal
4) Disrupted/delayed seaward movement
5) Discontinuous downstream dispersal
6) Active seaward movement as yearlings



W inter Passage — Preliminary Results



Tucannon Subbasin



Projects in the Tucannon Subbasin

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
199401806	**Implement Tucannon River Model Watershed Plan to Restore Salmonid Habitat**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$257,375	$252,625	$304,249	$318,417	Anadromous	Habitat	stream
BPA Spent	$102,535	$172,530	$294,006	$239,972			
199900100	Tuccanon WS Implementation				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Habitat	subbasin
BPA Spent	$35,256	$ 0	$ 0	$ 0			
200001900	**Tucannon River Spring Chinook Captive Broodstock Program**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$98,420	$94,509	$97,722	$101,045	Anadromous	Production	point
BPA Spent	$65,850	$68,470	$147,785	$98,987			
200107600	Acquire Tucannon River Water Rights				FY 2001 High Priority		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$120,000	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$ 0	$ 0	$10,104	$ 0			
200200600	*Evaluate Bull Trout Movements in the Tucannon and Lower Snake rivers*				*Columbia Plateau*		*yes*
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$81,626	$193,641	$202,224	Resident	Monitoring	area
BPA Spent	$ 0	$ 0	$200,793	$117,508			

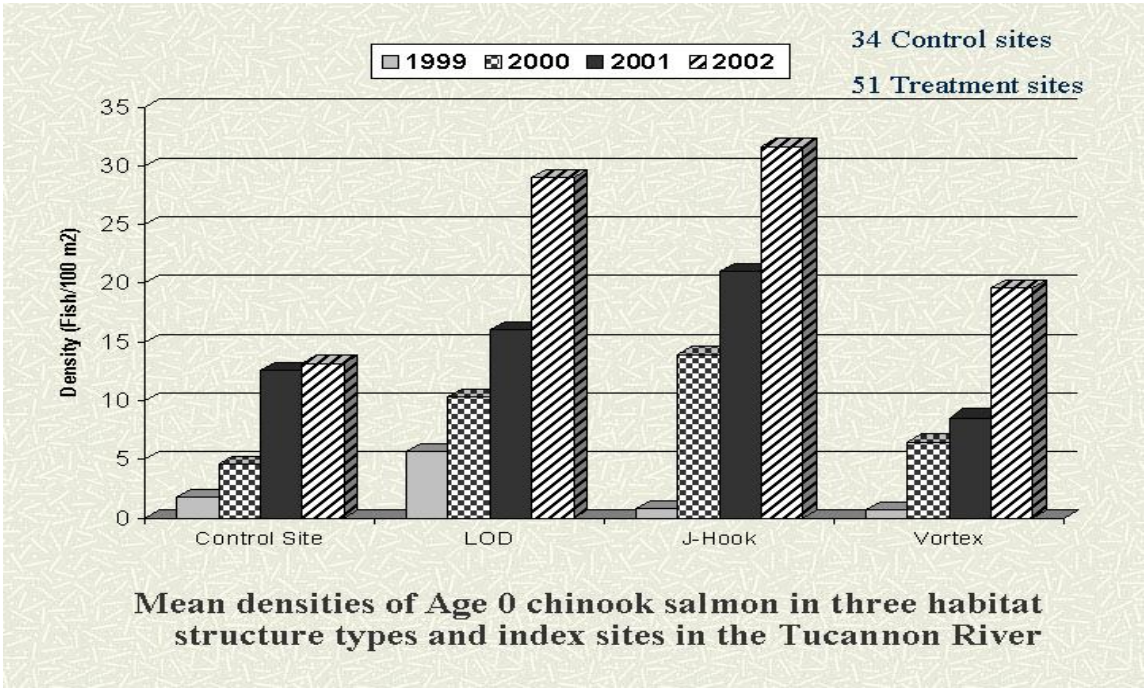
Projects in **bold** have preliminary results data included in this report. Projects in *italics* have preliminary results data included in Volume I.

Project 199401806 — *Implement Tucannon River Model Watershed Plan to Restore Salmonid Habitat*

2002-2003 Project Objectives

- Improve pool and spawning habitat and quality and quantity to improve adult prespawning and juvenile survival
- Enhance flows

Preliminary Results



Mean densities of Age 0 chinook salmon in three habitat structure types and index sites in the Tucannon River

To improve pool quality and quantity, the Columbia Soil and Water Conservation District has installed rootwad revetment (left), large organic debris placement (middle), and vortex weirs (right), in the Tucannon River. (Photographs: Courtesy of the Columbia Conservation Soil and Water Conservation District)

Project 200001900 — *Tucannon River Spring Chinook Captive Broodstock Program*

2002-2003 Project Objectives

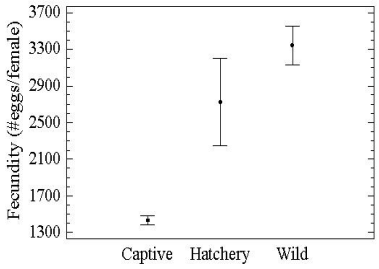
- Monitor survival and maturity rates of captive broodfish
- Monitor survival and viability of captive brood progeny
- Spawn mature captive brood adults

Preliminary Results

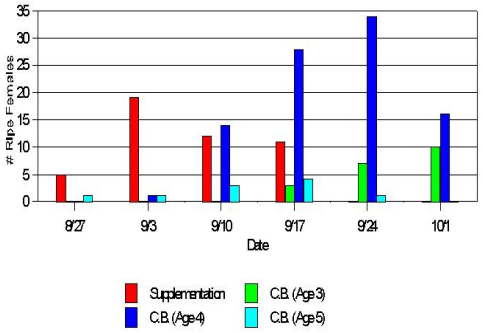
- Fish from the captive brood program matured earlier in age than fish collected from the river
- Captive males start to mature at Age 2 and captive females mature at Age 3
- Fecundity, egg size, fork length, and mortality to eye-up were different compared to hatchery and wild fish spawned in the supplementation program
- Spawn timing of captive brood females has been close to that of fish captured from the river

Captive broodfish are reared in tanks such as these until they are sexually mature and ready to spawn. (Photograph: Courtesy of the Washington Department of Fish and Wildlife)

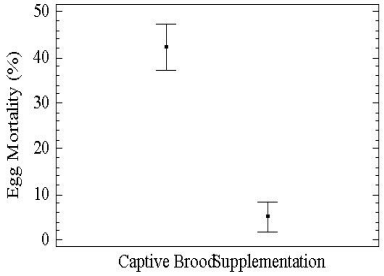
Fecundity by Origin



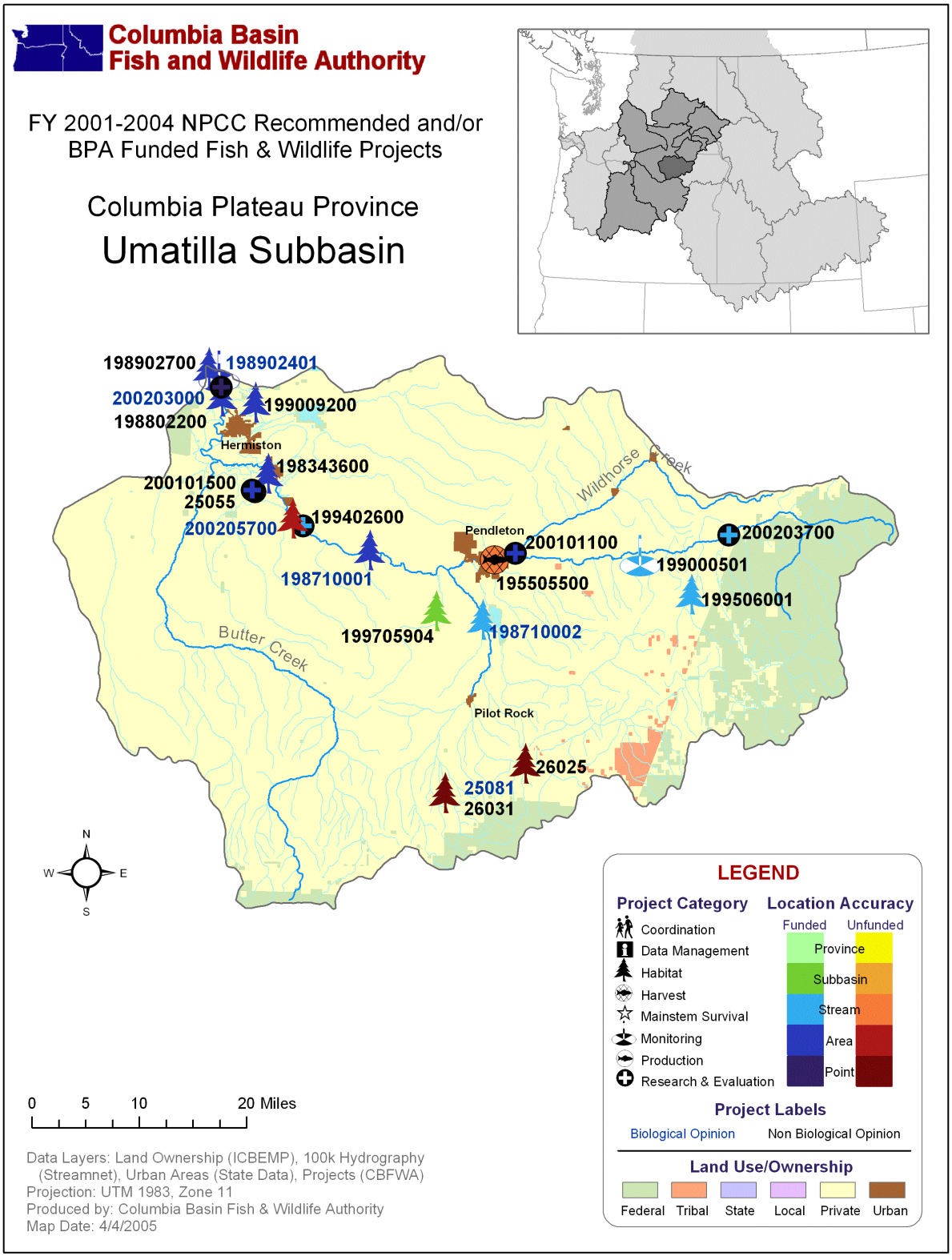
Spawn Timing Comparison



Mortality to Eye-up by Origin



Umatilla Subbasin



Projects in the Umatilla Subbasin

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
25055	Echo Meadows Artificial Recharge Extended Groundwater and Surface Water Modeling				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$390,283	$390,283	$ 0	Anadromous	Research & Evaluation	point
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25081	Improve Upstream Fish Passage in the Birch Creek Watershed				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$374,572	$210,410	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
26025	LP Ranch Acquisition				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$1,468,042	$ 0	$ 0	$ 0	Anadromous	Habitat	point
BPA Spent	$ 0	$ 0	$ 0	$ 0			
26031	Improve Upstream Fish Passage in the Birch Creek Watershed				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$300,410	$ 0	$ 0	$ 0	Anadromous	Habitat	point
BPA Spent	$ 0	$ 0	$ 0	$ 0			
195505500	Umatilla Tribal Fish & Wildlife Enforcement				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$163,369	$171,506	$ 0	Anadromous	Harvest	stream
BPA Spent	$ 0	$ 0	$ 0	$ 0			
198343600	Umatilla Basin Fish Facilities Operation and Maintenance				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$445,411	$460,555	$476,214	$492,405	Anadromous	Habitat	area
BPA Spent	$422,497	$417,609	$ 0	$476,359			
198710001	**Enhance Umatilla River Basin Anadromous Fish Habitat**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$270,987	$350,000	$350,000	$350,000	Anadromous	Habitat	area
BPA Spent	$7,085	$638,659	$269,437	$360,039			

Projects in **bold** have preliminary results data included in this report.

Projects in the Umatilla Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
198710002	**Umatilla Subbasin Fish Habitat Improvement**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$425,263	$300,264	$300,264	$300,264	Anadromous	Habitat	stream
BPA Spent	$371,927	$549,910	$359,556	$294,398			
198802200	**Umatilla River Fish Passage Operations**				**Columbia Plateau**		**no**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$327,600	$338,738	$350,256	$362,164	Anadromous	Habitat	area
BPA Spent	$415,592	$319,320	$425,710	$245,784			
198902401	**Evaluate Juvenile Salmonid Outmigration and Survival in the Lower Umatilla River Basin**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$347,489	$286,427	$296,166	$306,235	Anadromous	Monitoring	area
BPA Spent	$232,732	$201,549	$301,961	$299,642			
198902700	Power Repay Umatilla Basin Project				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$800,000	$1,000,000	$1,000,000	$1,000,000	Anadromous	Habitat	area
BPA Spent	$437,548	$468,977	$1,596,097	$572,736			
199000501	**Umatilla Basin Natural Production Monitoring and Evaluation Project**				**Columbia Plateau**		**no**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$318,333	$375,716	$385,260	$395,129	Anadromous	Monitoring	stream
BPA Spent	$685,305	$1,334,397	$427,785	$324,949			
199009200	Protect and Enhance the Wanaket Wildlife Mitigation Area				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$204,438	$211,389	$218,576	$226,008	Wildlife	Habitat	area
BPA Spent	$203,471	$259,939	$166,670	$198,855			
199402600	**Pacific Lamprey Research and Restoration**				**Columbia Plateau**		**no**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$453,267	$468,678	$484,613	$501,090	Anadromous	Research & Evaluation	stream
BPA Spent	$379,062	$418,963	$546,859	$472,374			

Projects in **bold** have preliminary results data included in this report.

Projects in the Umatilla Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
199506001	*Protect and Enhance Wildlife Habitat in Squaw Creek Watershed*				*Columbia Plateau*		*no*
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$205,188	$212,164	$219,378	$226,837	Wildlife	Habitat	stream
BPA Spent	$82,719	$97,609	$145,246	$149,316			
199705904	Oregon Wildlife Planning & Coordination CTUIR				FY 1999		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Wildlife	Habitat	subbasin
BPA Spent	$4,335	$ 0	$ 0	$ 0			
200101100	Habitat Diversity in Alluvial Rivers				FY 2001 Innovative		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$319,860	$ 0	$ 0	$30,000	Anadromous	Research & Evalua-tion	area
BPA Spent	$57,285	$74,415	$151,761	$34,794			
200101500	Echo Meadow Project - Winter Artificial Recharge to Cool Rivers				FY 2001 Innovative		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$232,000	$ 0	$ 0	$358,000	Anadromous	Research & Evalua-tion	area
BPA Spent	$ 0	$309,473	$268,269	$187,713			
200203000	Develop Progeny Marker for Salmonids to Evaluate Supplementation				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$149,655	$152,151	$198,661	Anadromous	Research & Evalua-tion	point
BPA Spent	$ 0	$ 0	$139,615	$155,712			
200203700	Characterize Genetic Differences and Distribution of Freshwater Mussels				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$220,000	$228,000	$237,000	Resident	Research & Evalua-tion	stream
BPA Spent	$ 0	$ 0	$217,352	$210,724			
200205700	Westland-Ramos Fish Passage and Habitat Restoration Pilot Project				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$203,020	$1,044,080	$203,000	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$161,379			

Projects in *italics* have preliminary results data included in Volume I.

Project 198710001 — *Enhance Umatilla River Basin Anadromous Fish Habitat*

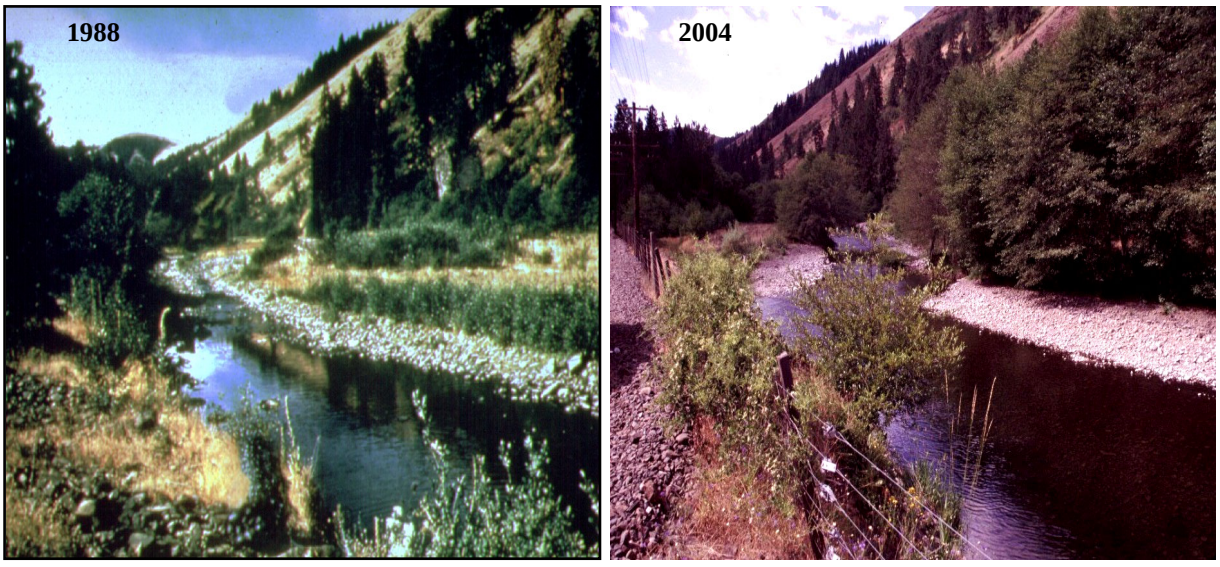
2002-2003 Project Objectives

- Implement habitat enhancement projects on private properties in the Umatilla River Basin to achieve habitat recovery

Preliminary Results

Since 1987

- Secured 52 conservation easements– anticipate the addition of 4 additional easements
- Enhanced 20 miles of stream
- Installed 25 miles of livestock exclusion fence
- Planted 72,275 native trees and shrubs, 6,130 pounds of native grass seed, and 2,016 grass plugs
- Placed 356 trees and rootwads instream
- Installed 65 tree and rootwad revetments
- Eliminated three passage barriers



Though the use of protective measures such as fencing, the quality of the riparian habitat in the Meacham Creek watershed has improved. (Photographs: Courtesy of the Confederated Tribes of the Umatilla Indian Reservation)

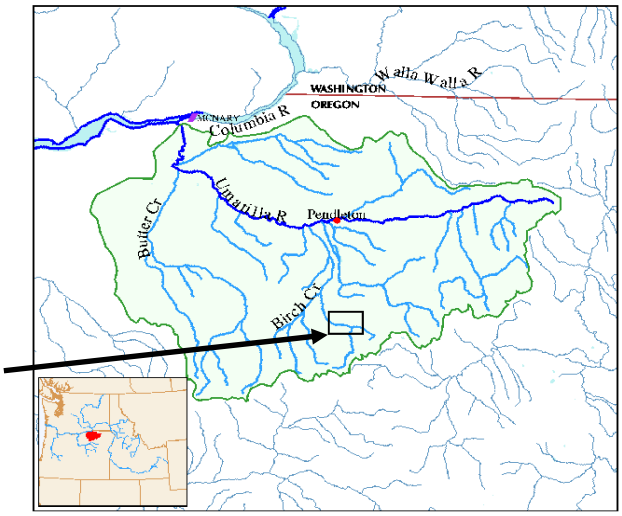
Project 198710002 — *Umatilla River Fish Habitat Enhancement Project*

2002-2003 Project Objectives

- Restore riparian vegetation
- Create naturally stable channels along altered streams

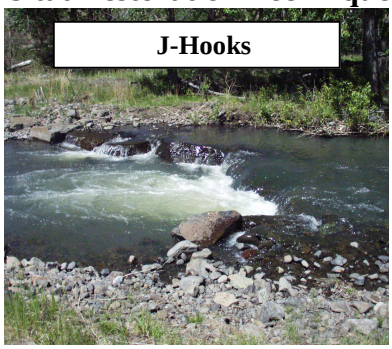
Preliminary Results

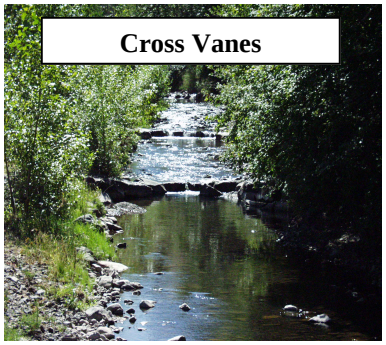
Birch Creek Habitat Restoration (Houser Property)



In 2002, biologists initiated efforts to re-establish stable channel dimensions, patterns, and profiles for the portion of Birch Creek associated with the Houser's property. In an attempt to reconnect the flood plain and improve channel geometry and width/depth ratio, point bars were installed. The photo taken during 2004 highlights the improvements (established riparian vegetation and improved habitat complexity) that have been achieved through the restoration efforts. (Photographs:Courtesy of Confederated Tribes of the Umatilla Indian Reservation)

Habitat Restoration Techniques





The planting of willows/cottonwoods and the implementation of J-hooks and cross vanes were used to improve riparian and instream habitat in Birch Creek. (Photographs:Courtesy of Confederated Tribes of the Umatilla Indian Reservation)

Project 198802200 — *Umatilla River Fish Passage Operations*

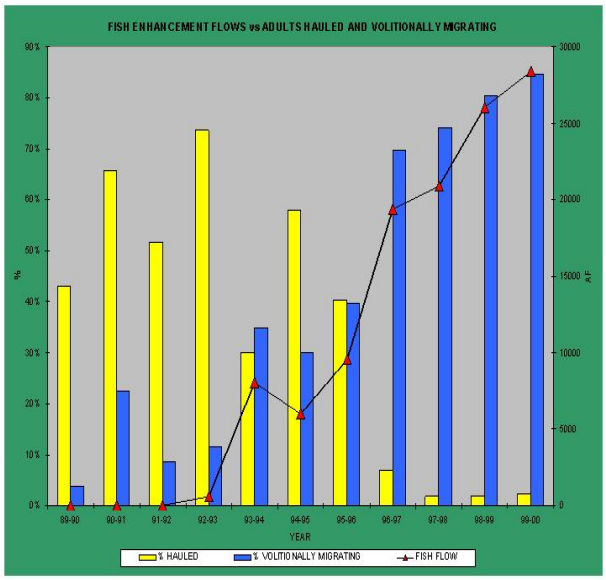
2002-2003 Project Objectives

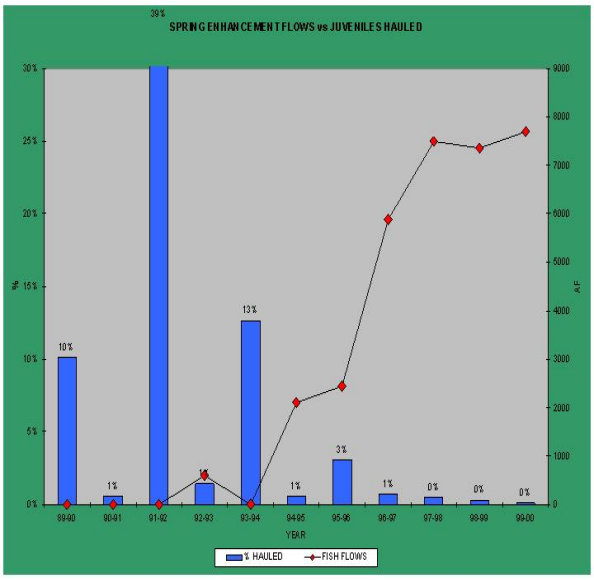
- Increase the survival of migrating juvenile and adult salmon and summer steelhead in the Umatilla River

Physical Passage Facilities—Preliminary Results

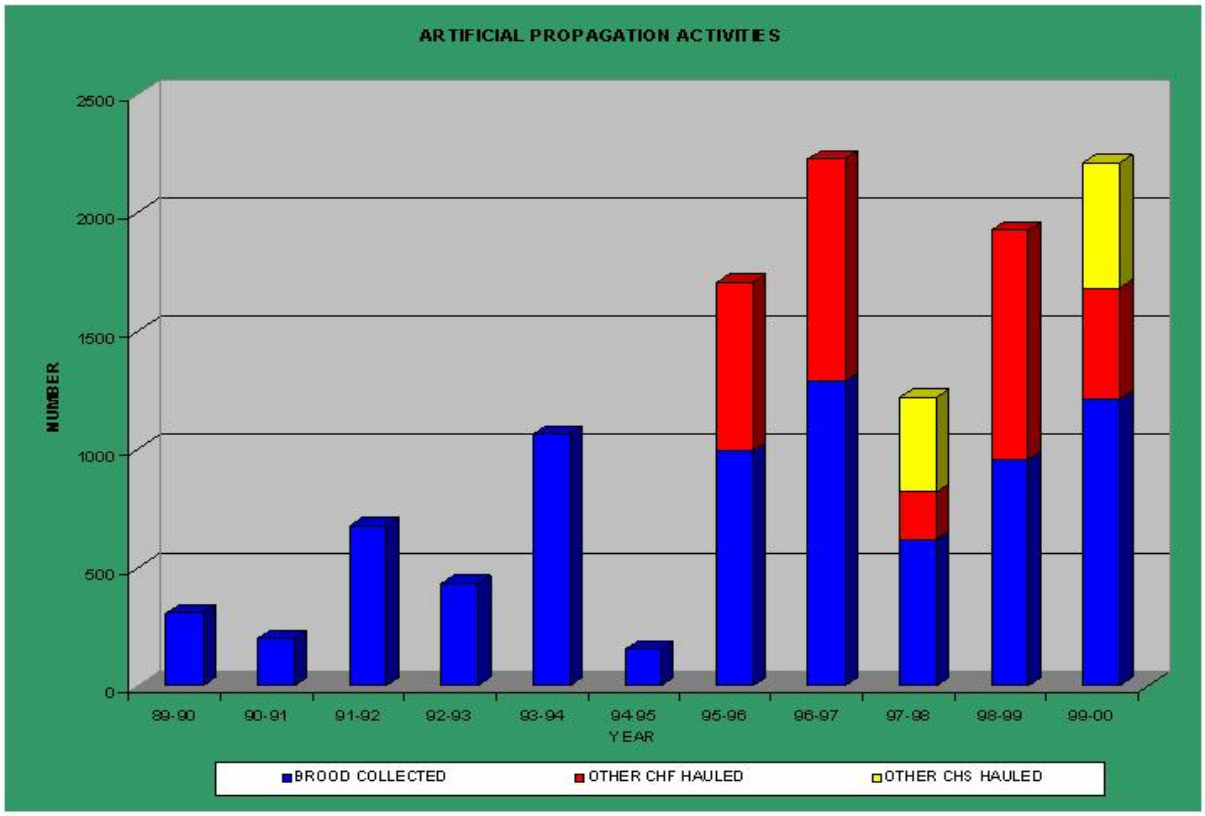
Passage facilities such as these adult fish ladders and juvenile screens have been completed to assist in the restoration of salmonids in the Umatilla River Subbasin. (Photographs: Courtesy of the Confederated Tribes of the Umatilla Indian Reservation)

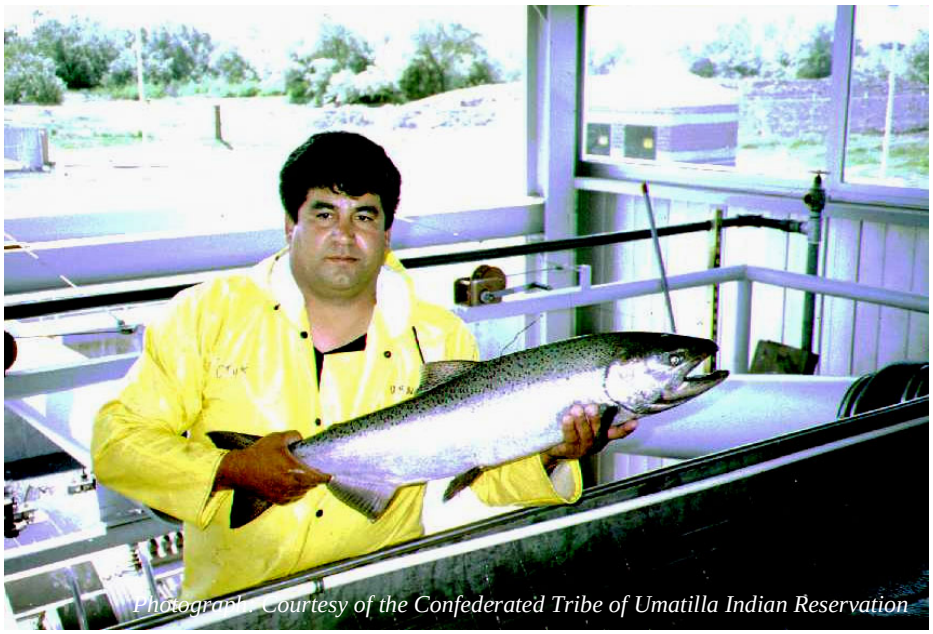
Flow Enhancement and Trap/Hauling Efforts—Preliminary Results





Artificial Propagation—Preliminary Results





Photograph: Courtesy of the Confederated Tribe of Umatilla Indian Reservation

Project 198902401 — *Evaluate Juvenile Salmonid Outmigration and Survival in the Lower Umatilla River*

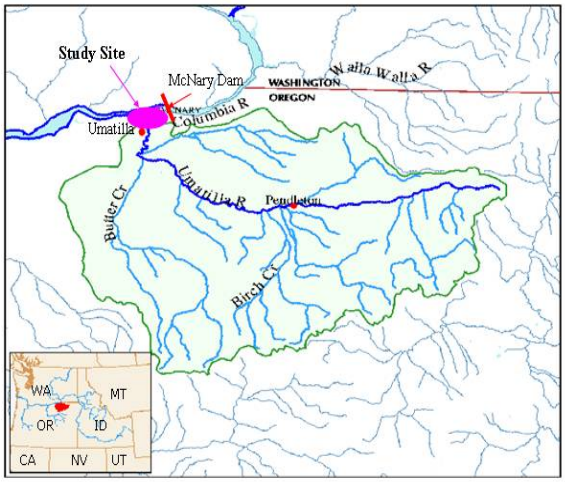
2002-2003 Project Objectives

- Evaluate relative survival between transported and non-transported tagged sub-yearling Chinook salmon migrants
- Determine juvenile salmonid migrant abundance, migration timing, and in-basin survival of tagged fish representing various hatchery rearing, release, and acclimation strategies
- Determine migration timing and abundance of tagged natural fish and monitor trends in natural production of salmon, steelhead, and Pacific lamprey

Preliminary Results

- Migration patterns of hatchery fish were similar to those of natural fish except in fall Chinook salmon
- In-basin performance of hatchery migrants was poor and highly variable from year to year
- No consistent pattern of in-basin survival of standard-transferred and fall-transferred fish
- Fall Chinook salmon direct released at RM 48.5 displayed improved survival over fish acclimated and released upstream at RM 73.5
- Fish released lower in the river survived at a much higher rate
- Average annual natural summer steelhead smolt production is 49,488

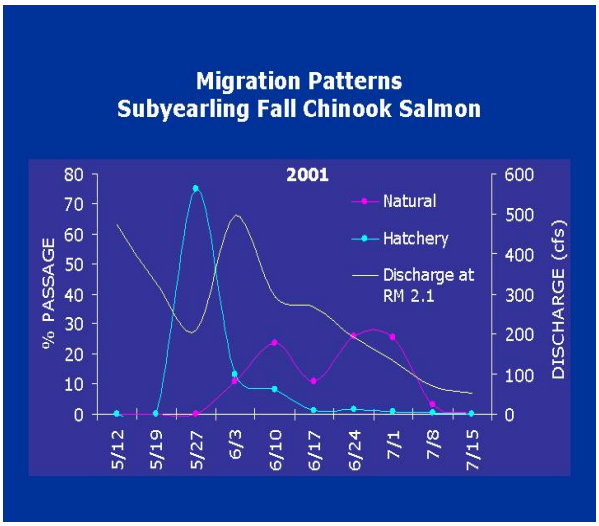
Umatilla River Location

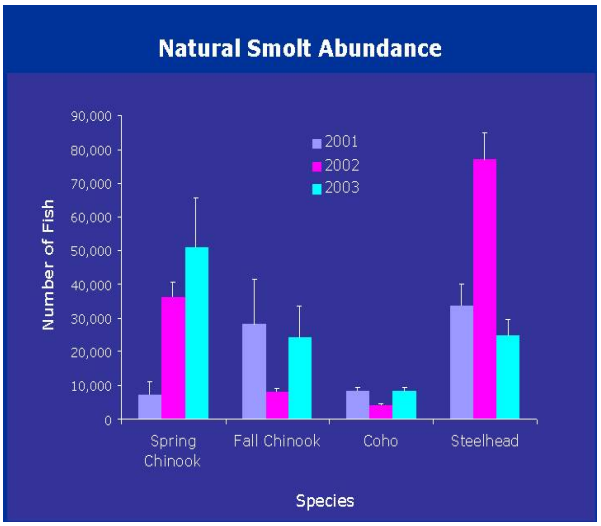


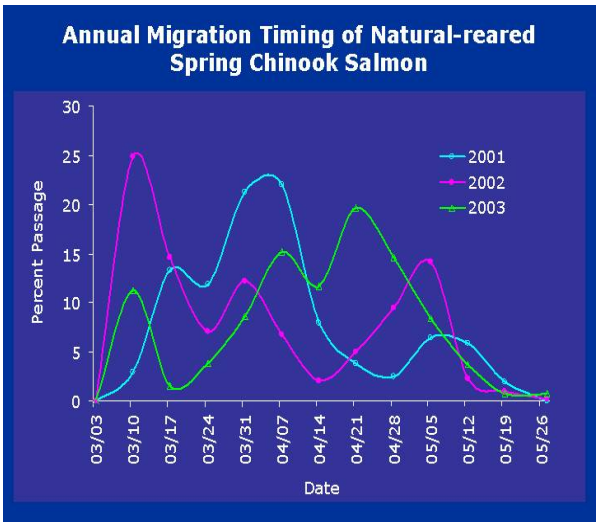
Photograph: Courtesy of the Oregon Department of Fish and Wildlife

- Smolt/spawner ratios as an in-basin measure of productivity have been low
- Migration timing of natural migrants varied between species and years
- Fall Chinook salmon are emigrating as subyearlings and steelhead at a broad distribution of ages
- Subyearling fall Chinook salmon are emigrating during June and July
- Relationship between environmental variables and passage timing was variable

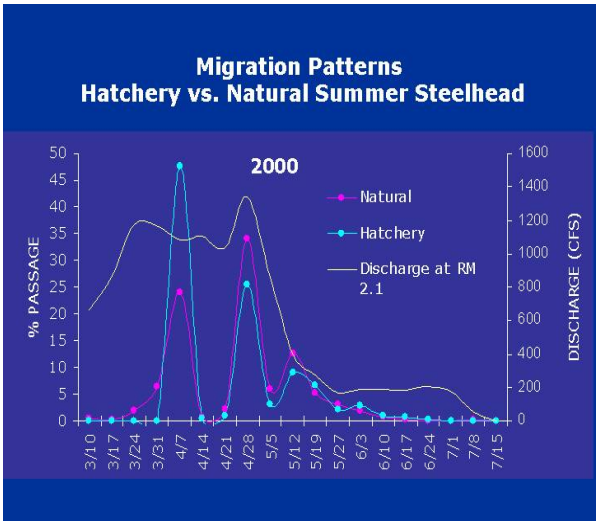
Migration Timing and Abundance — Preliminary Results







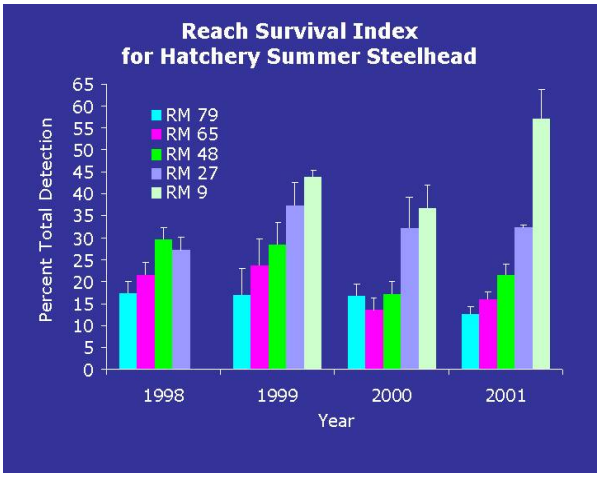
Migration timing of salmonid smolts is monitored via by this PIT Tag detection system at the Three Mile Falls Dam East. (Photograph: Courtesy of the Oregon Department of Fish and Wildlife)

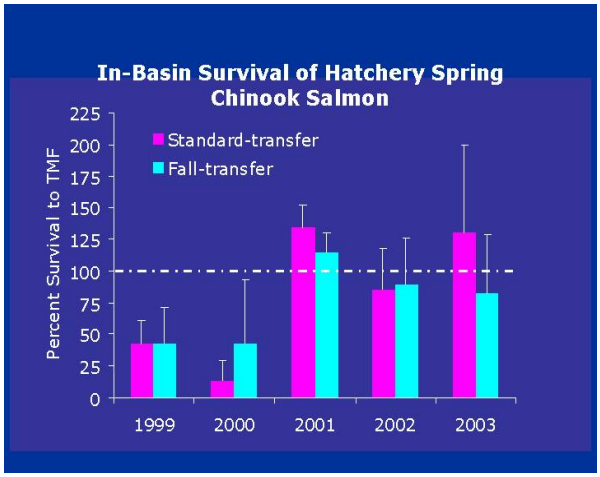


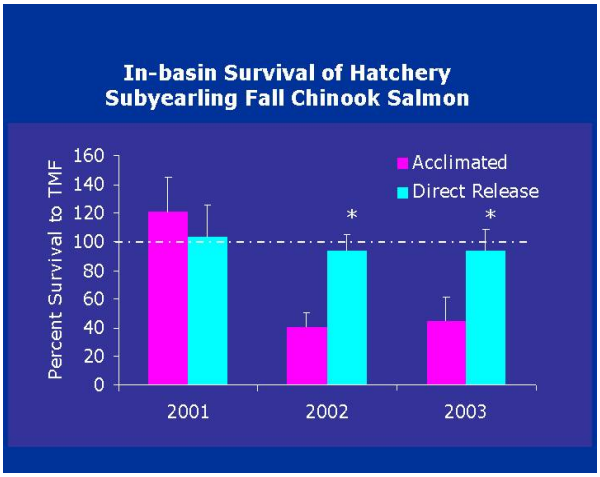
In-basin and Reach Survival — Preliminary Results

In-basin Survival of Hatchery Migrants
(1999-2003)

Species	Range	Mean (%)
CHS	34.7-108.3	69.7 (±17.1)
CHF	53.5-110	74.3 (±28.7)
CHF0	53.4-112	74.8 (±12.0)
STS	40.4-85.8	57.8 (±14.4)







Three Mile Dam and associated fish observation facilities. (Photograph: Courtesy of the Oregon Department of Fish and Wildlife

Project 199000501 — *Umatilla Basin Natural Production Monitoring and Evaluation Project*

2002-2003 Project Objectives

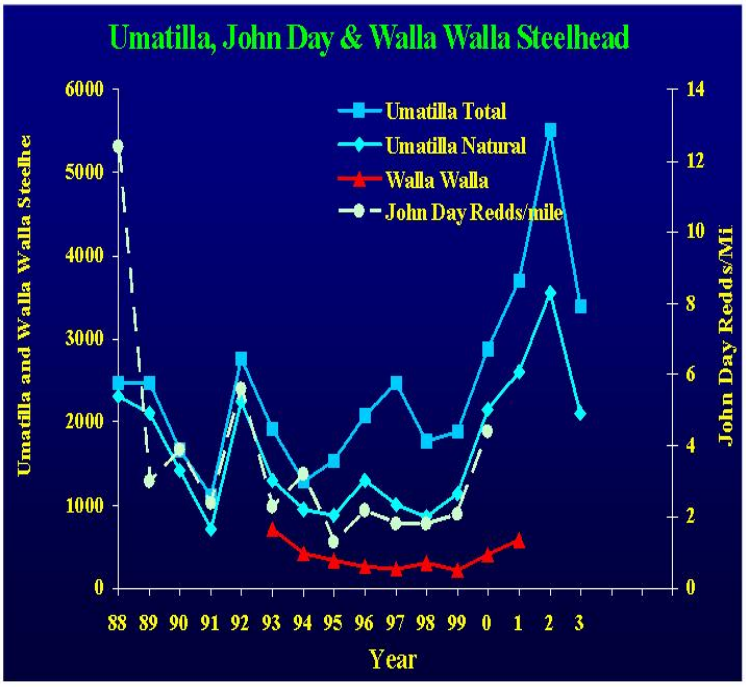
- Monitor spawning activities of hatchery and natural summer steelhead in the Umatilla River Basin
- Estimate timing and survival of juvenile salmon and steelhead migrating from the Umatilla River
- Estimate juvenile salmonid abundance and rearing densities at index sites and selected stream reaches in the Umatilla River basin
- Estimate tribal harvest of adult salmonids returning to the Umatilla River basin
- Monitor stream temperatures in the Umatilla River basin
- Determine age, growth, and life history characteristics of salmonids in the Umatilla River basin

Natural Spawning —-Preliminary Results

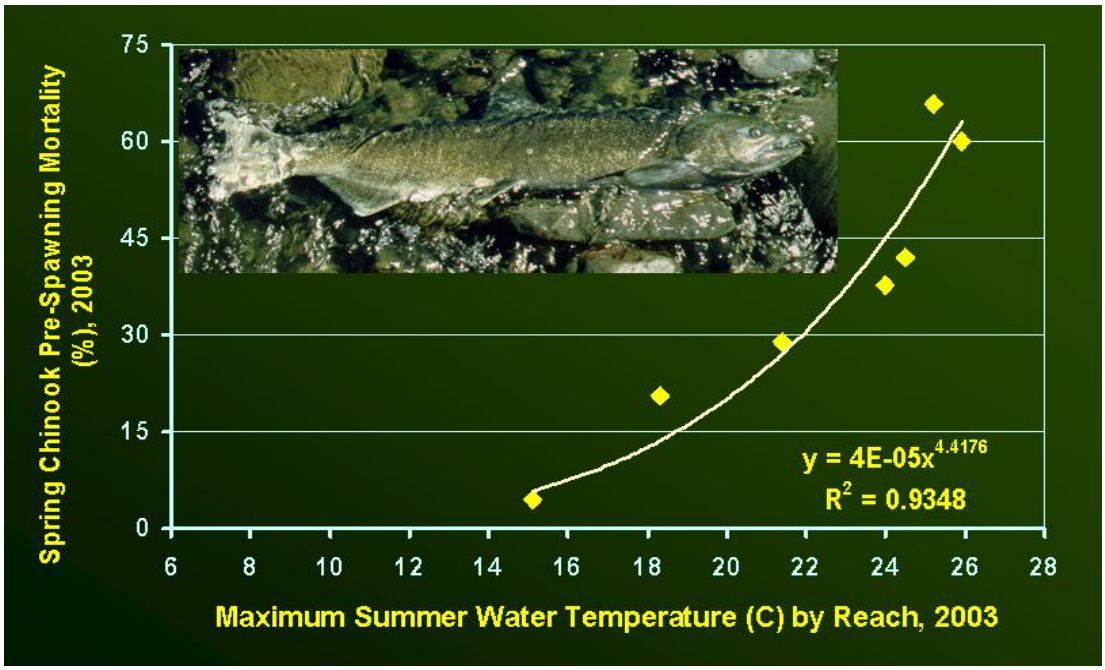
Summer Steelhead Spawning Surveys

Return Year	Female Steelhead	Redds Observed	Eggs (millions) Deposited
1995	862	74	4.7 (potential)
1996	1207	119	6.5
1997	1327	138	7.1
1998	1000	126	5.1
1999	1099	218	6.0
2000	1618	238	7.7
2001	2260	383	12.5
2002	3040	347	15.3
2003	1754*	337*	10.8*
2004	1929*	216*	11.6*

- Spawning peaks in early-April and ranges from late-February through May
- Adults are 60-70% females
- 10-20% of estimated redds observed
- Hatchery steelhead were observed spawning naturally



Habitat Surveys (Water Temperature Monitoring) —-Preliminary Results



Outmigration Studies —-Preliminary Results

Umatilla River Steelhead Smolt Survival Estimates

Year	Rearing Type	Number Tagged	Estimated Survival	Estimated Survival Rate	P-Value
1999	Natural	3855	1990	0.516	
	Artificial	4251	2159	0.508	<0.001
2000	Natural	1671	650	0.389	
	Artificial	4786	1413	0.295	<0.001
2001	Natural	2746	464	0.169	
	Artificial	13157	1962	0.149	<0.001
2002	Natural	446	489	1.096	
	Artificial	1276	1108	0.869	<0.001

Age and Growth Evaluations —-Preliminary Results

Steelhead Returns by Brood Year, Sex and Age

Brood Year	Sex	Age 1.1	Age 1.2	Age 2.1	Age 2.2	Age 2.3	Age 3.1	Age 3.2	Age 4.1	Total Nat. Return
1992	F	18	0	710	281	20	55	0	14	1,510
	M	8	0	302	62	5	27	0	8	
1993	F	0	0	332	183	0	40	12	0	794
	M	0	0	160	40	0	23	4	0	
1994	F	14	0	337	317	0	18	0	0	988
	M	6	0	192	93	0	11	0	0	
1995	F	0	0	406	192	26	114	77	0	1,262
	M	0	0	244	93	10	70	30	0	
1996	F	19	0	1048	890	0	90	59	0	3,184
	M	11	0	643	353	0	47	24	0	
1997	F	0	0	693	558*	*	138*	*	*	2,080
	M	0	0	357	233*		101*			
Total		79	0	5424	3295	61	734	206	22	***9,773***
		0.8%	0%	55.5%	33.7%	0.6%	7.5%	2.1%	0.2%	

Harvest Estimates —-Preliminary Results

Total Spring Chinook Salmon Harvest Estimates	
Year	**Adults Harvested**
1993	**176**
1996	**167**
1997	**174**
1999	**110**
2000	**695**
2001	**247**
2002	**245**
2003	**234**

Umatilla tribal members with spring Chinook salmon harvested from the Umatilla River Subbasin. (Photograph: Courtesy of the Confederated Tribes of the Umatilla Indian Reservation)

Project 199402600 — *Pacific Lamprey Research and Restoration*

2002-2003 Project Objectives

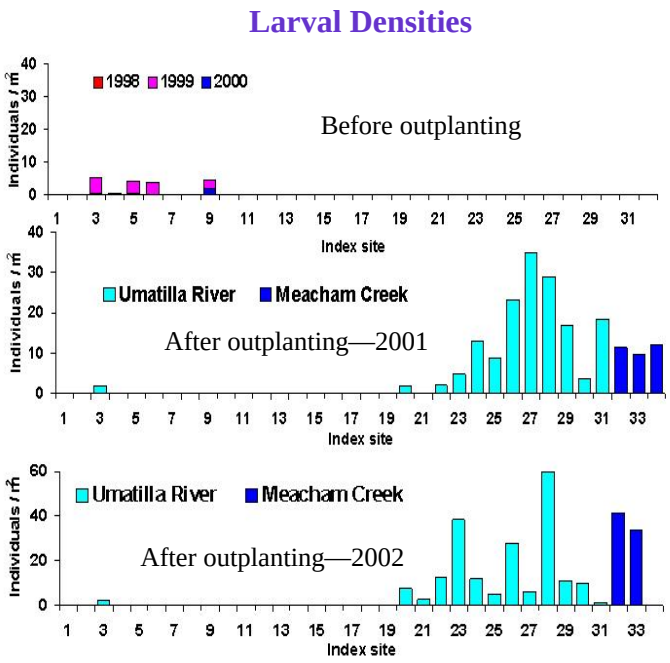
- Increase larval abundance in the Umatilla River
- Determine reproductive success of adult lamprey outplants
- Estimate the number of adult lamprey entering the Umatilla River
- Monitor larval population trends
- Estimate the number of recently metamorphosed lampreys migrating from the Umatilla River

Nest and Egg Viability Surveys—Preliminary Results

- Lampreys spawned during the first two weeks of June
  - 2000: 51 viable nests
    30 nests without eggs
  - 2001: 49 viable nests
  - 2002: 67 viable nests
- Egg viability ranged from 58-100% (on average 86% of the eggs were viable)

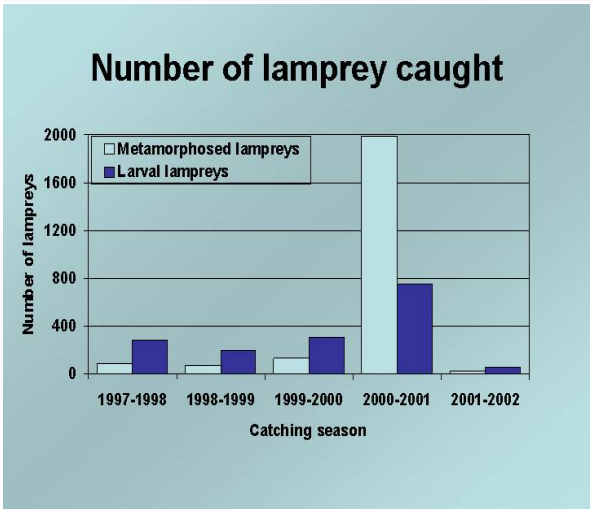
A pacific lamprey spawning in the Umatilla River. (Photograph: Courtesy of the Confederated Tribes of the Umatilla Indian Reservation)

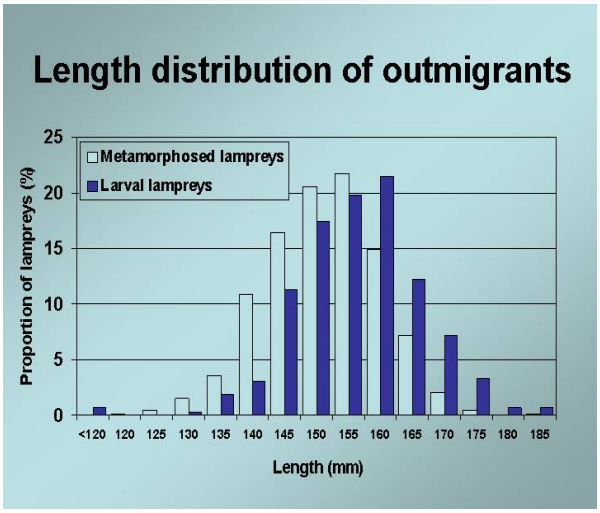
Larval Densities—Preliminary Results



- Mean density (individiaul/m) of all sites:
  - 1998—0.02
  - 1999—0.55
  - 2000—0.08
  - 2001—5.6
  - 2002—8.0

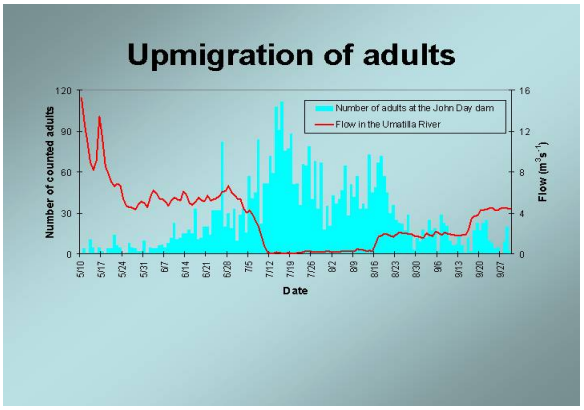
Outmigration—Preliminary Results



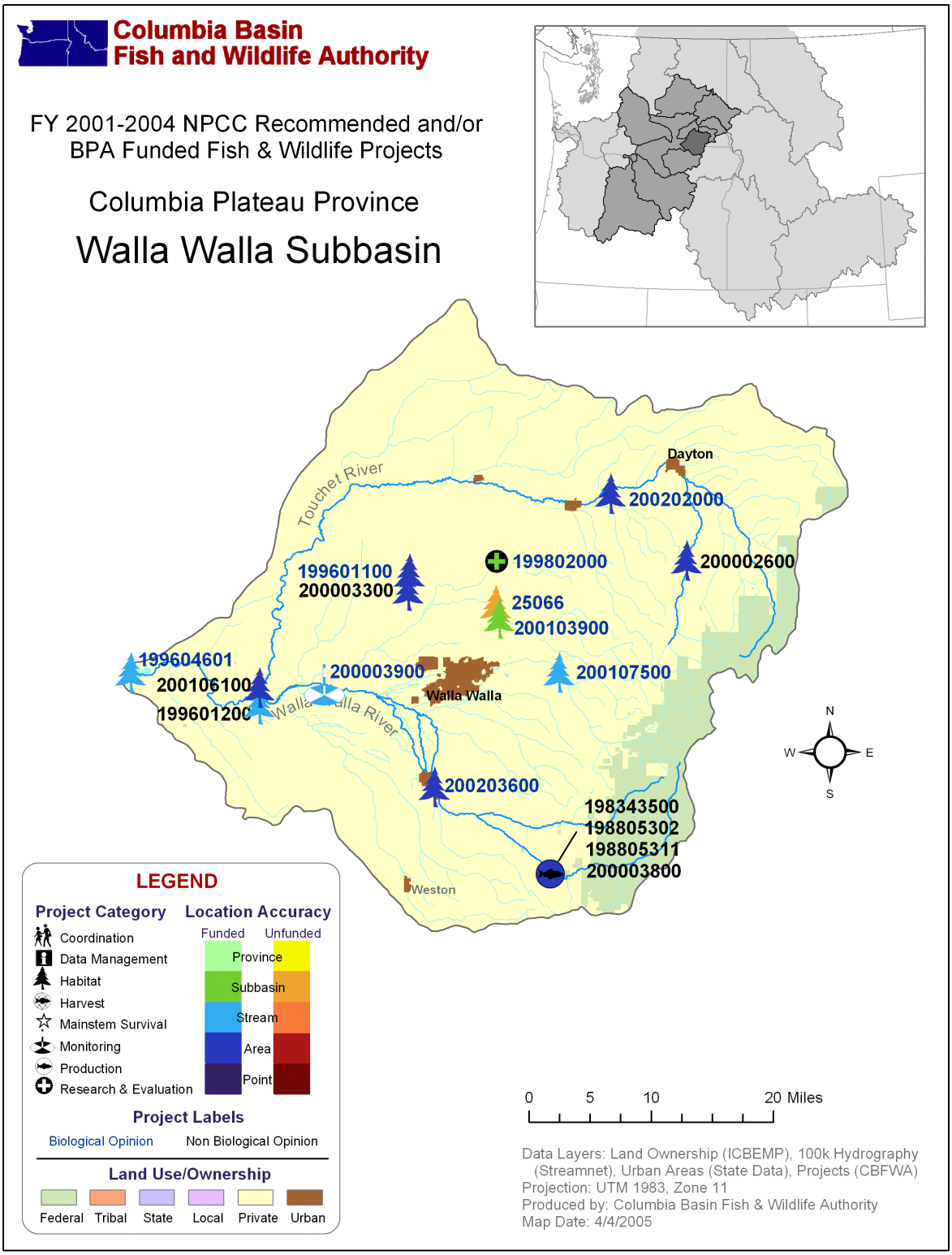


Upmigration—Preliminary Results

The number of adult lampreys migrating up the Umatilla River during the summer is low due to reduced flows that result from irrigation practices. (Photographs: Courtesy of the Confederated Tribes of the Umatilla Indian Reservation)



Walla Walla Subbasin



Projects in the Walla Walla Subbasin

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
25066	Manage Water Distribution in the Walla Walla River Basin				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$552,525	$498,799	$ 0	Anadromous	Habitat	subbasin
BPA Spent	$ 0	$ 0	$ 0	$ 0			
198343500	**Operate and Maintain Umatilla Hatchery Satellite Facilities**				**Columbia Plateau**		**no**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$920,977	$952,290	$984,668	$1,018,147	Anadromous	Production	area
BPA Spent	$776,240	$968,224	$944,718	$918,892			
198805302	Design and Construct Umatilla Hatchery Supplement				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$35,000	$ 0	$ 0	$ 0	Anadromous	Production	area
BPA Spent	$14,776	$ 0	$ 0	$ 0			
198805311	NEOH Umatilla CTUIR Parametrix				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Production	point
BPA Spent	$ 932	$ 0	$ 0	$ 0			
199601100	**Walla Walla River Juvenile and Adult Passage Improvements**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$450,000	$465,300	$481,120	$1,971,800	Anadromous	Habitat	area
BPA Spent	$581,973	$1,480,201	$423,936	$1,435,757			
199601200	Anad Fish Passage Walla Walla				FY 1999		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$400,000	$ 0	$ 0	$ 0			
199604601	**Walla Walla Basin Fish Habitat Enhancement**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$251,122	$259,660	$268,489	$277,617	Anadromous	Habitat	stream
BPA Spent	$12,063	$528,757	$317,878	$177,565			

Projects in **bold** have preliminary results data included in this report.

Projects in the Walla Walla Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
199802000	**Assess Fish Habitat and Salmonids in the Walla Walla Watershed in Washington**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$158,490	$163,879	$169,451	$174,250	Anadromous	Research & Evaluation	subbasin
BPA Spent	$88,449	$158,800	$198,127	$178,328			
200002600	*Rainwater Wildlife Area*				*Columbia Plateau*		*no*
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$279,744	$289,255	$299,090	$304,926	Wildlife	Habitat	area
BPA Spent	$23,054	$177,559	$135,119	$ 0			
200003300	**Walla Walla River Fish Passage Operations**				**Columbia Plateau**		**no**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$80,000	$109,551	$113,276	$117,127	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$90,947	$86,013			
200003800	Design and Construct NEOH Walla Walla Hatchery				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$177,000	Anadromous	Production	area
BPA Spent	$44,131	$ 0	($16,641)	$27,038			
200003900	**Walla Walla Basin Natural Production Monitoring and Evaluation Project**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$330,880	$498,886	$510,518	$522,546	Anadromous	Monitoring	stream
BPA Spent	$ 0	$ 0	$288,940	$472,041			
200103900	Install Fish Screens to Protect ESA-listed Steelhead and Bull Trout in the Walla Walla Basin				FY 2001 High Priority		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$461,700	$ 0	$ 0	$ 0	Anadromous	Habitat	subbasin
BPA Spent	$ 0	$ 0	$153,986	$ 0			

Projects in **bold** have preliminary results data included in this report. Projects in *italics* have preliminary results data included in Volume I.

Projects in the Walla Walla Subbasin, continued...

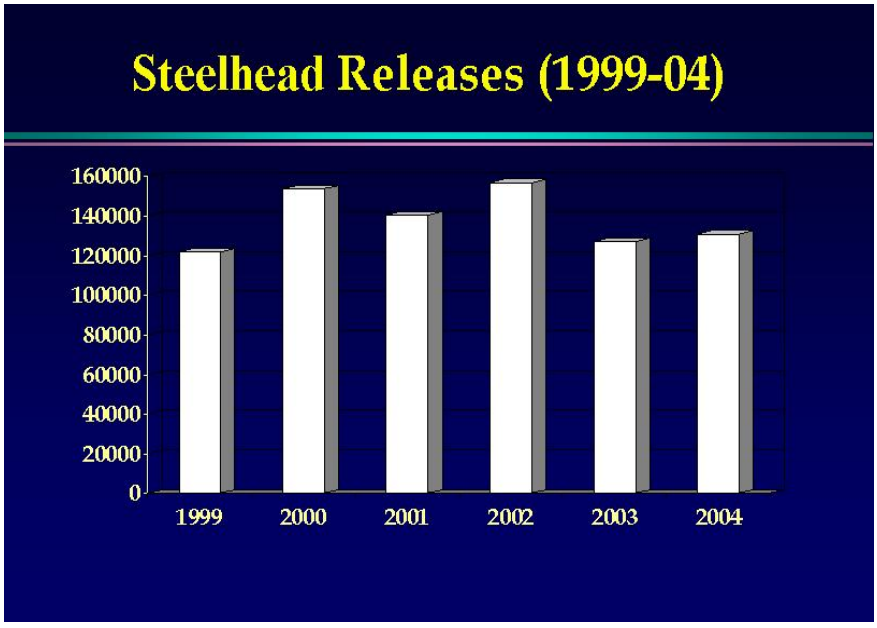
Project ID	*Project Title*				*Review Cycle*		*BiOp?*
200106100	Touchet River Flow Acquisition				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$115,524	$ 0	$ 0	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$102,024	$13,500	$ 0			
200107500	Increase In Stream Flows to De-watered Stream Reaches in the Walla Walla Basin				FY 2001 High Priority		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$590,000	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$ 0	$69,804	$92,550	$ 0			
200202000	Fabricate and Install New Hunstville Mill Fish Screen				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$120,000	$120,000	$10,500	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$78,097	$50,016			
200203600	Walla Walla River Flow Restoration				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$478,000	$ 0	$70,000	Anadromous	Habitat	area
BPA Spent	$ 0	$161,448	$180,087	$65,470			

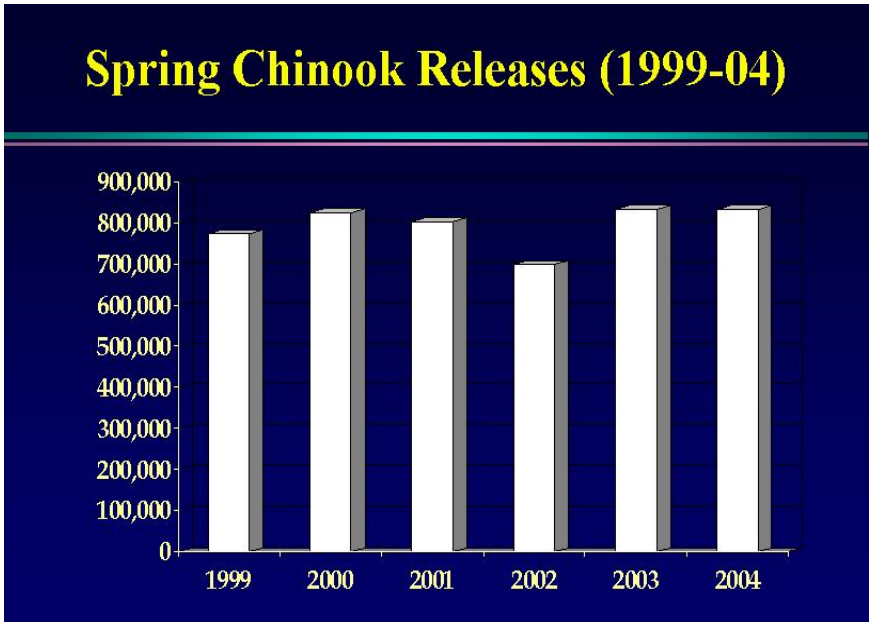
Project 198343500 — *Umatilla Hatchery and Satellite Facility* and
Project 198903500 — *Umatilla Hatchery**

2002-2003 Project Objectives

- Increase adult Chinook salmon and steelhead returns to the Umatilla River Basin
- Produce 150,000 Umatilla summer steelhead smolts
- Produce 600,000 spring Chinook salmon smolts

Preliminary Results





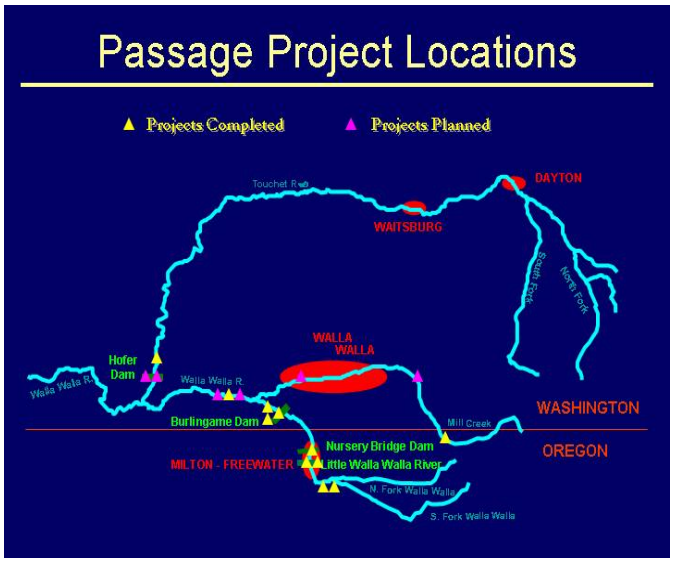
** Budget information for this project is located in the Columbia Upper Middle Subbasin section.*

Project 199601100 — *Walla Walla River Juvenile and Adult Fish Passage Improvements*

2002-2003 Project Objectives

- Provide safe passage and diversion structures for migrating juvenile and adult salmonids in the Walla Walla Basin

Preliminary Results



Dams Removed

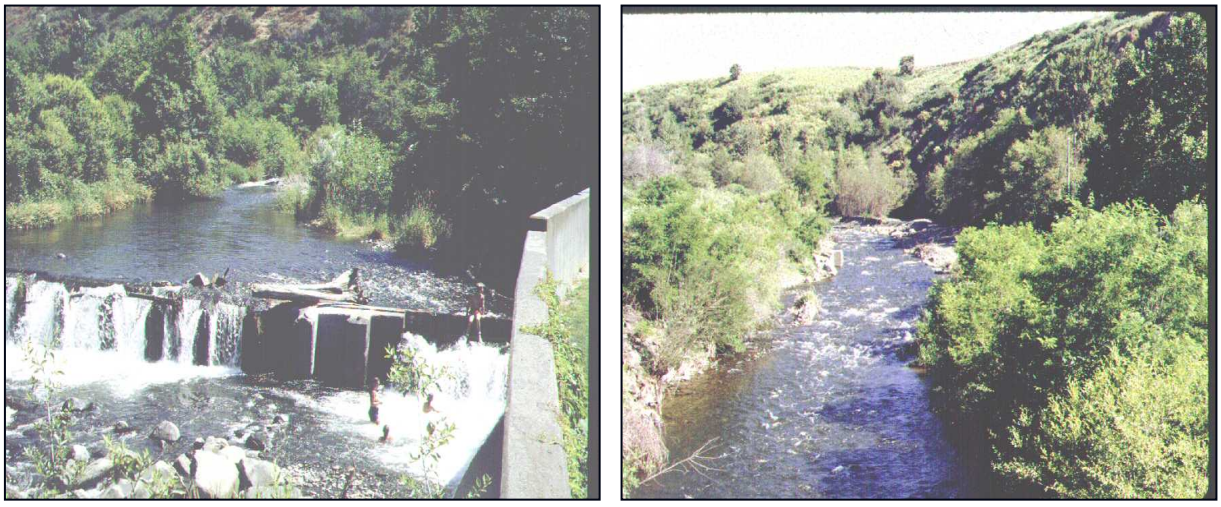
- 1997—Marie Dorian Dam
- 1998—Maiden Dam

New Ladders at Diversion Dams

- 1998—Burlingame
- 2000—Little Walla Walla
- 2001—Nursery Bridge
- 2002—Garden City/Lowden

New Screens at Diversion Canals

- 1999—Burlingame
- 2000—Little Walla Walla (with smolt trap)
- 2000—Smith-Nelson
- 2001—City of Walla Walla cost share
- 2002—Garden City/Lowden
- 2004—Milton Ditch



Prior to 1997, the Marie Dorian Dam (left) was a barrier to fish passage; however, in 1997 the Confederated Tribes of the Umatilla Indian Reservation removed the dam and restored fish passage (right). (Photographs: Courtesy of the Confederated Tribes of the Umatilla Indian Reservation)

Preliminary Results—Continued

Milton Project Benefits

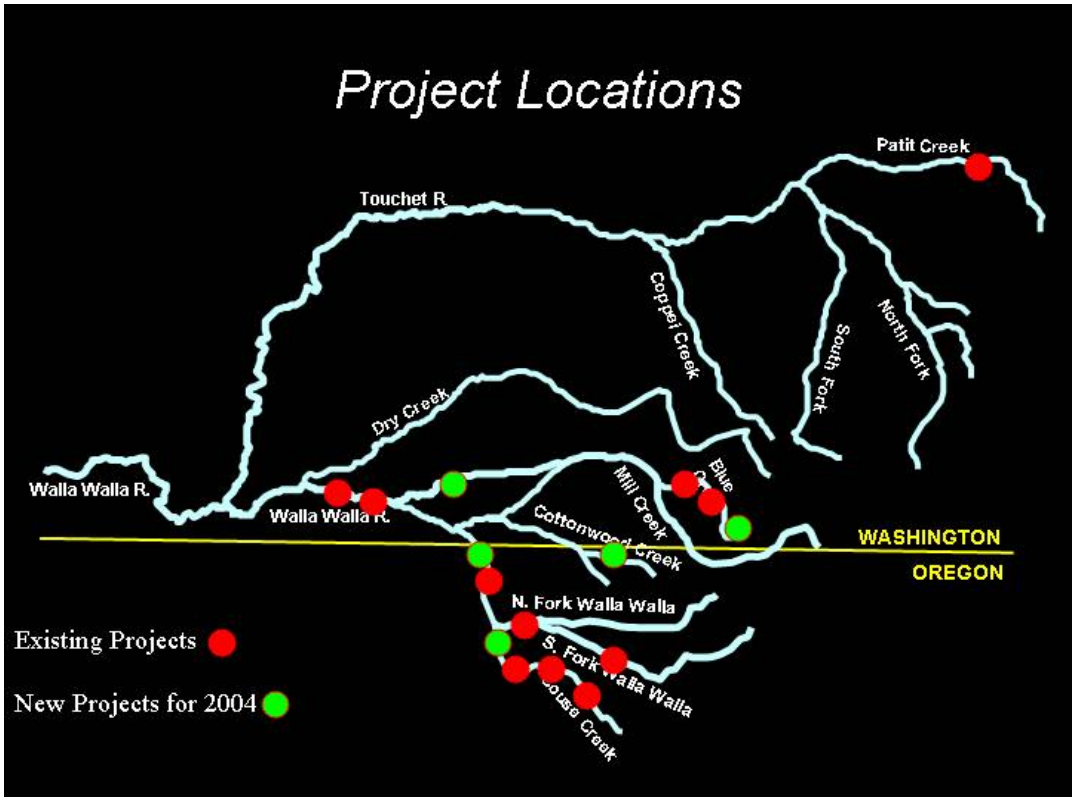
- Abandon fish killing screens
- Utilize state-of-art screens
- Eliminate push-up dam in the Walla Walla River
- Improve upstream passage in the Walla Walla River and Couse Creek
- Maintain additional 10 cfs in the river for 2 miles
- Conserve 3-5 cfs to augment the instream flows in a critical reach below the Little Walla Walla Diversion

Project 199604601 — *Walla Walla Basin Fish Habitat Enhancement*

2002-2003 Project Objectives

- Identify and implement habitat restoration and protection projects that provide long-term benefits to biological systems and the salmonids

Preliminary Results



Accomplishments from 1997-2000

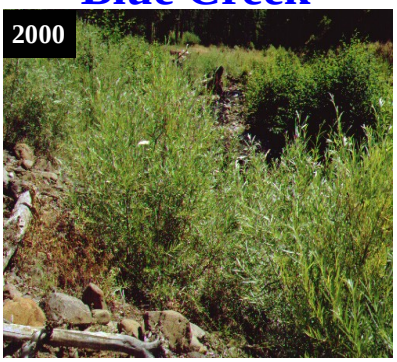
- Stream miles protected - 8
- Acres seeded to native grass - 62
- Native plants planted (Rooted) – 25,000+
- Native plantes (cuttings) - 30,000+
- Weed control -100 acres/year

Accomplishments in 2004

- Native plants planted - 4,000
- Signed two riparian easements
- Native grass seeding - 12 acres

Project Monitoring—Preliminary Results

Blue Creek



Blue Creek

Walla Walla River

(Photographs: Courtesy of the Confederated Tribes of the Umatilla Indian Reservation)

Project 199802000 — *Assess Fish Habitat and Salmonids in the Walla Walla Watershed in Washington*

2002-2003 Project Objectives

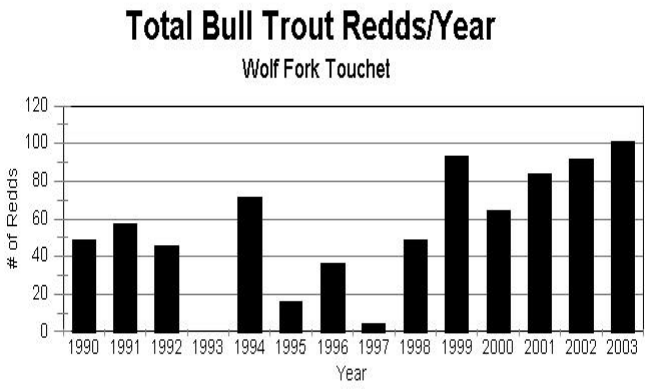
- Assess habitat condition
- Determine salmonid distribution and relative abundance

Stream Temperature and Flow—Preliminary Results

- Stream flows in the Walla Walla Basin exhibit a sharp decline in late-June, followed by low summer flows and an increase in discharge in fall and winter
- Middle and lower sections of the Touchet and Walla Walla rivers were characterized by daily maximum temperatures above 68°F during 2003

Salmonid Distribution and Relative Abundance —Preliminary Results

- Rainbow/steelhead trout represented the most common salmonids in the basin during 2003 surveys
- Rainbow trout (≥8 inches) were found in low densities throughout the basin
- Documented steelhead spawning distribution and abundane in Mill, Coppei, Patit, and Whiskey creeks and confirmed spawning in the mainstem Walla Walla below Stateline, Cottonwood Creek, East Little Walla Walla, and Yellowhawk Creek
- Large numbers of Age 0+ steelhead were found in the mainstem Walla Walla River suggesting that spawning is occurring in the Washington portion of the river
- Few spring Chinook salmon were documented in the Walla Walla basin during 2003
- Bull trout distribution was greatest in the North Fork and the Wolf Fork of the Touchet River
- Low densities of bull trout were found in Spangler, Lewis, and Mill creeks
- Documented bull trout spawning in Spangler, Burnt Fork, and Lewis creeks



Bull trout redd documented in the Walla Walla basin. (Photograph: Courtesy of the Washington Department of Fish and Wildlife)

Project 200003300 — *Walla Walla River Fish Passage Operations*

2002-2003 Project Objectives

- Increase the survival of migrating juvenile and adult salmon and summer steelhead in the Walla Walla River

Physical Passage Facilities—Preliminary Results

Passage facilities such as these adult fish ladders (right) and juvenile screens (left) have been completed to assist in the restoration of salmonids in the Walla Walla Subbasin. (Photographs: Courtesy of the Confederated Tribes of the Umatilla Indian Reservation)

Trap and Haul—Preliminary Results

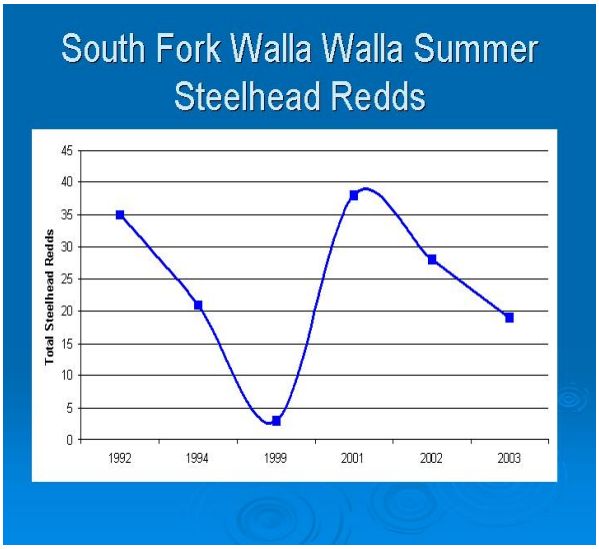
Survival benefits to migrating salmonids in the Walla Subbasin are provide through the operation of a trap and haul program. (Photographs: Courtesy of the Confederated Tribes of the Umatilla Indian Reservation)

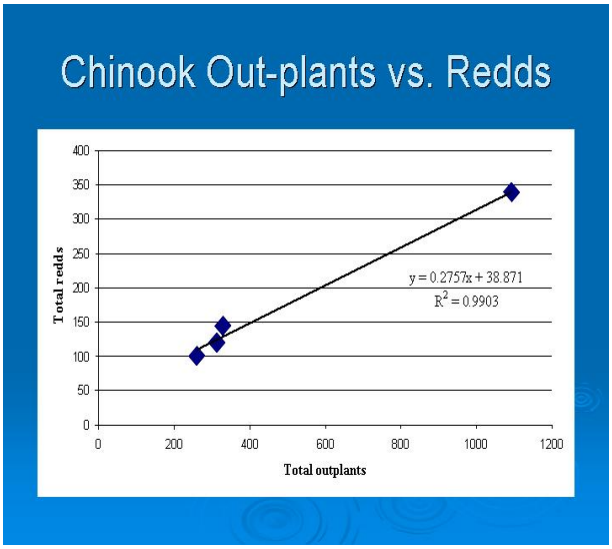
Project 200003900 — *Walla Walla Basin Natural Production Monitoring and Evaluation Program*

2002-2003 Project Objectives

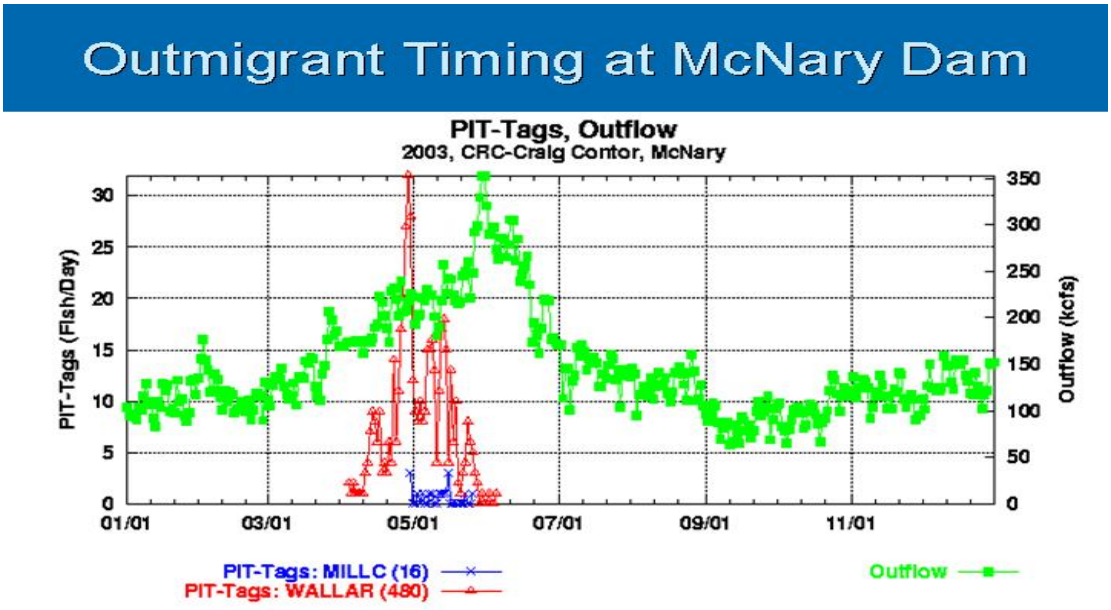
- Monitor spawning activities of Chinook salmon and summer steelhead in the Walla Walla River Basin
- Estimate timing and survival of juvenile salmon and steelhead migrating from the Walla Walla River to the lower Columbia
- Estimate juvenile abundance, distribution, and rearing densities at index site and selected stream reaches in the Walla Walla River Basin

Spawning—Preliminary Results

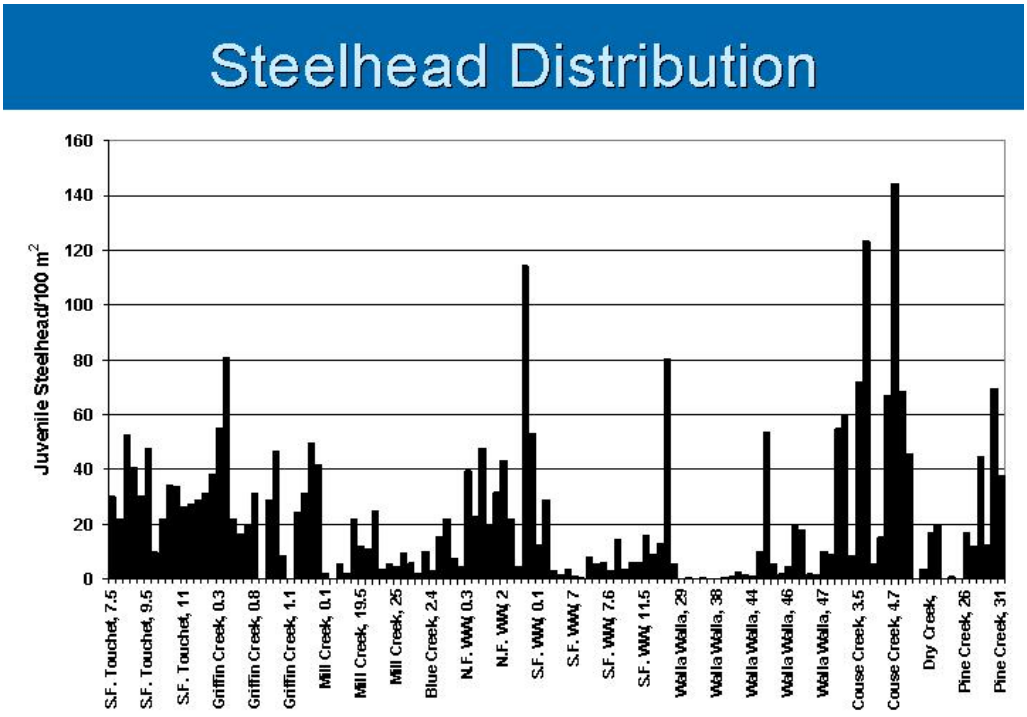


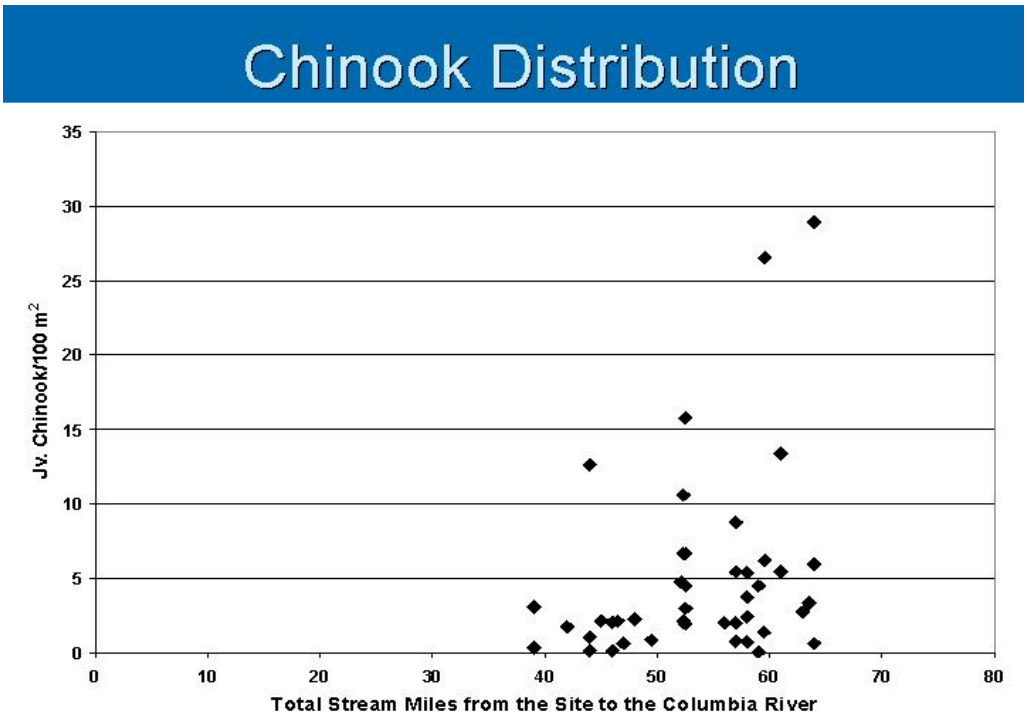


Outmigrant Timing—Preliminary Results

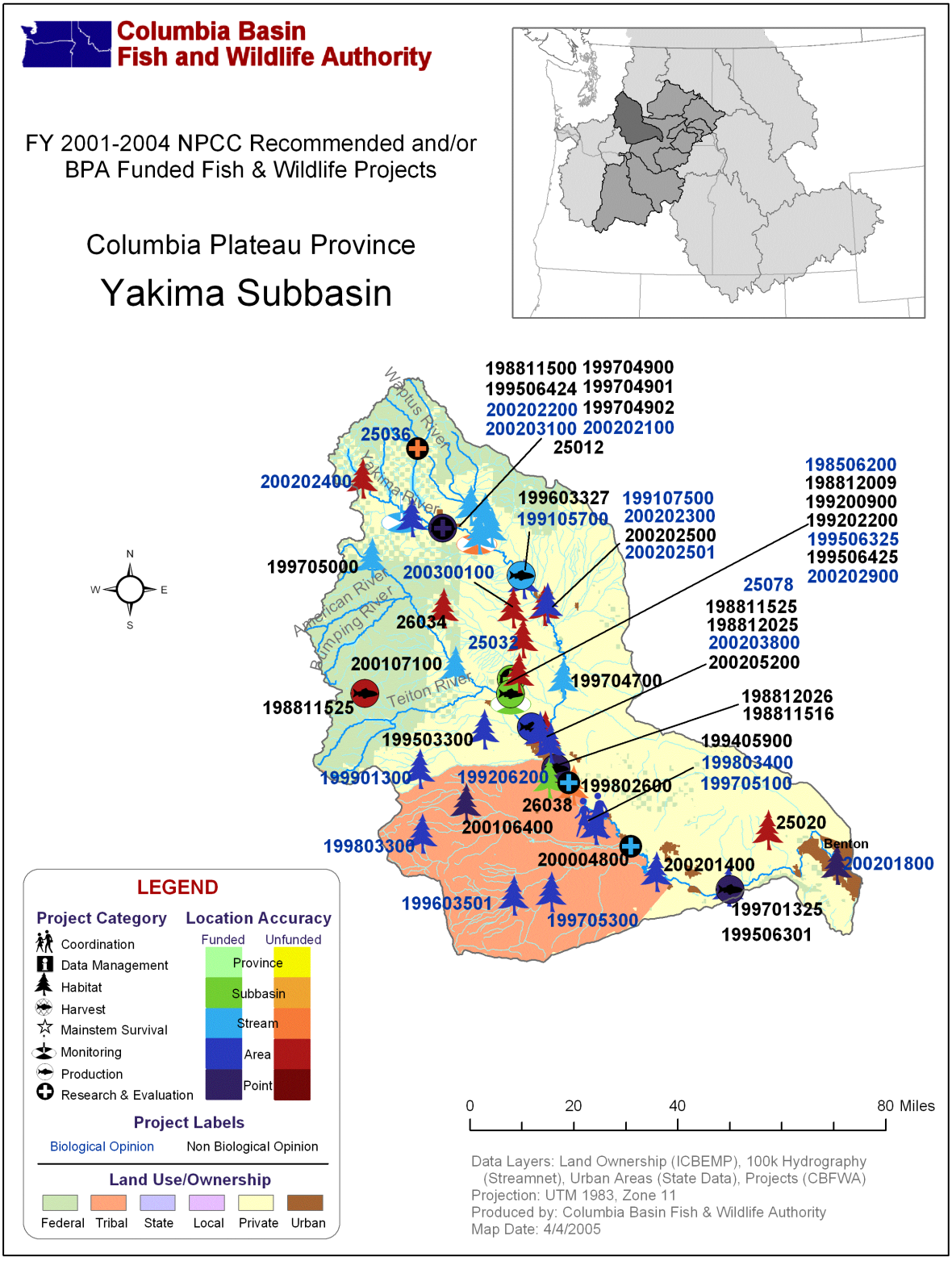


Abundance and Distribution—Preliminary Results





Yakima Subbasin



Projects in the Yakima Subbasin

Project ID	Project Title				Review Cycle		BiOp?
25012	Assessment of Bull Trout Populations in the Yakima River Watershed				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$243,947	$165,000	$ 0	Resident	Monitoring	stream
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25020	Acquire Rattlesnake Slope Addition				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$3,542,500	$ 0	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25032	Wenas Wildlife Area Inholding Acquisitions				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$706,143	$ 0	$ 0	Wildlife	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25036	The Impact of Flow Regulation on Riparian Cottonwood Ecosystems in the Yakima River Basin				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$225,495	$134,421	$ 0	Anadromous	Research & Evaluation	stream
BPA Spent	$ 0	$ 0	$ 0	$ 0			
25078	Acquire Anadromous Fish Habitat in the Selah Gap to Union Gap Flood Plain, Yakima River Basin, Washington				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$875,000	$875,000	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
26034	Kittitas Valley Reach Acquisitions				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$2,000,000	$ 0	$ 0	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
26038	Acquire Anadromous Fish Habitat in the Union Gap Reach and Wenas Basin, Yakima River Basin, Washington				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$3,000,000	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$ 0	$ 0	$ 0	$ 0			
198506200	**Passage Improvement Evaluation**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$100,000	$103,400	$106,916	$110,551	Anadromous	Monitoring	subbasin
BPA Spent	$111,279	$110,566	$118,258	$104,446			

Projects in **bold** have preliminary results data included in this report.

Projects in the Yakima Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
198811500	Cle Elum Mon/Eval Bldg				FY 1999		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Production	point
BPA Spent	$128,561	$710,706	$147,386	($13,050)			
198811516	Yakima Hatchery Acclimation Site				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Production	point
BPA Spent	$37,558	$ 0	$ 0	$ 0			
198811525	Yakima/Klickitat Fisheries Project (YKFP) Design and Construction				Columbia Gorge		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$233,000	$234,000	$5,629,000	$ 0	Anadromous	Production	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
198811525	Yakima/Klickitat Fisheries Project (YKFP) Design and Construction				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$978,000	$1,011,252	$1,045,635	$1,258,000	Anadromous	Production	area
BPA Spent	$ 0	$ 0	$228,935	$39,049			
198812009	Steelhead Fall Chinook Production Objectives				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Production	subbasin
BPA Spent	$62,986	$ 0	$ 0	$ 0			
198812025	Yakima/Klickitat Fisheries Project (YKFP) Management				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$800,000	$827,200	$855,325	$999,371	Anadromous	Production	area
BPA Spent	$263,805	$1,158,673	$564,082	$924,281			
198812026	YIN Hatchery Educate/Training				FY 1999		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Production	point
BPA Spent	$ 303	$201,156	$164,162	($ 1)			
199105700	Fabricate and Install Yakima Basin Phase II Fish Screens				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$71,875	$159,889	$20,000	$ 0	Anadromous	Habitat	area
BPA Spent	$309,749	$198,084	$6,006	$123,876			

Projects in the Yakima Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
199107500	Yakima Phase II Screens - Construction				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$1,000,000	$600,000	$500,000	$300,000	Anadromous	Habitat	area
BPA Spent	$1,229,762	$519,999	$147,172	$306,446			
199200900	Operate and Maintain (O&M) Yakima Basin Phase II Fish Screens				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$135,000	$148,557	$155,584	$163,364	Anadromous	Habitat	subbasin
BPA Spent	$47,220	$ 0	$188,730	$99,124			
199202200	Wild Smolt Behavior/Physiology				FY 2001 Ongoing		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$350,024	$ 0	$ 0	$ 0	Anadromous	Research & Evalua-tion	subbasin
BPA Spent	$431,384	$420,361	$99,956	$ 0			
199206200	*Yakama Nation - Riparian/Wetlands Restoration*				*Columbia Plateau*		*yes*
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$1,370,000	$1,416,580	$1,464,744	$1,514,545	Anadromous	Habitat	subbasin
BPA Spent	$ 0	$3,261,204	$672,669	$453,539			
199405900	Yakima Basin Environmental Education				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$127,500	$130,000	$132,000	$135,000	Anadromous	Coordina-tion	area
BPA Spent	$73,991	$120,569	$104,713	$142,933			
199503300	O&M Of Yakima Phase II Fish Facilities				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$100,000	$103,400	$106,916	$110,551	Anadromous	Habitat	area
BPA Spent	$133,137	$56,827	$92,755	$124,885			
199506301	YKFP/YIN Chandler Juvenile Facility				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$21,248	$ 0			

Projects in *italics* have preliminary results data included in Volume I.

Projects in the Yakima Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
199506325	**Yakima/Klickitat Fisheries Project Monitoring and Evaluation**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$3,708,932	$3,835,036	$3,965,427	$4,100,251	Anadromous	Monitoring	subbasin
BPA Spent	$2,851,805	$4,379,405	$2,997,600	$3,723,889			
199506424	WDFW/YKFP Supp Monitor Activities				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Monitoring	stream
BPA Spent	$969,991	$1,336,155	$707,036	$ 0			
199506425	Policy/Technical Involvement and Planning in the Yakima/Klickitat Fisheries Project				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$15,000	$187,800	$193,435	$186,700	Anadromous	Production	subbasin
BPA Spent	$98,548	$92,175	$175,864	$157,022			
199603327	Coho Supplementation Yakima River Construction				FY 1999		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Production	stream
BPA Spent	$169,844	$250,027	$ 0	$ 0			
199603501	Satus Watershed Restoration Project				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$160,000	$352,966	$370,125	$388,600	Anadromous	Habitat	area
BPA Spent	$472,353	$111,177	$341,034	$398,568			
199701325	**Yakima/Klickitat Fisheries Project Operations and Maintenance**				**Columbia Plateau**		**no**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$2,350,000	$2,429,900	$2,512,517	$2,597,942	Anadromous	Production	point
BPA Spent	$2,030,204	$4,433,547	$2,530,981	$2,709,549			
199704700	Yakima River Basin Side Channels				FY 1998		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$45,677	$106,685	$ 0	$ 0			

Projects in **bold** have preliminary results data included in this report.

Projects in the Yakima Subbasin, continued...

Project ID	Project Title				Review Cycle		BiOp?
199704900	Teanaway River Instream Flow Restoration BOR				FY 1999		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$232,946	$58,341	$4,348	$ 0			
199704901	Teanaway River Instream Flow Restoration NRCS				FY 1999		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$2,310	$ 0	$ 0	$ 0			
199704902	Teanaway River Instream Flow Restoration KCCD				FY 1999		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$31,226	$ 0	$ 0	$ 0			
199705000	Little Naches Riparian Channel				FY 2001 Ongoing		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$120,417	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$299,417	$6,601	$ 0	$ 0			
199705100	Yakama Nation Yakima/Klickitat Fisheries Project (YKFP) Yakima Side Channels				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$565,136	$584,350	$1,753,704	Anadromous	Habitat	point
BPA Spent	$230,030	$569,080	$54,101	$7,059			
199705300	Toppenish-Simcoe Instream Flow Restoration and Assessment				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$237,503	$245,577	$225,000	$205,000	Anadromous	Habitat	area
BPA Spent	$70,510	$270,270	$117,267	$36,502			
199802600	Native Trout Populations				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$ 0	Resident	Research & Evaluation	stream
BPA Spent	$39,408	$33,001	$ 0	$ 0			
199803300	Restore Upper Toppenish Watershed				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$190,000	$196,460	$203,140	$210,046	Anadromous	Habitat	area
BPA Spent	$66,034	$276,962	$42,031	$275,105			

Projects in the Yakima Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
199803400	Yakama Nation Yakima/Klickitat Fisheries Project (YKFP) Reestablish Safe Access into Tributaries of the Yakima Subbasin				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$784,794	$ 0	$230,000	$237,820	Anadromous	Habitat	area
BPA Spent	$359,924	$155,170	$124,296	$182,763			
199901300	**Ahtanum Creek Watershed Assessment**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$200,192	$206,999	$214,036	$221,313	Anadromous	Habitat	area
BPA Spent	$107,273	$176,113	$210,266	$175,788			
200004800	Benthic Index Biotic Integrity				FY 2000		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$ 0	$40,000	Anadromous	Research & Evaluation	stream
BPA Spent	$34,661	$45,837	$29,010	$36,314			
200106400	Improve Stream Flow and Passage for Simcoe Creek Steelhead				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$767,143	$ 0	$ 0	$ 0	Anadromous	Habitat	point
BPA Spent	$ 0	$200,000	$401,840	$ 0			
200107100	Increase Naches River In-stream Flows Through Wapatox Power Buyout				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$4,000,000	$ 0	$ 0	$ 0	Anadromous	Habitat	stream
BPA Spent	$ 0	$8,121	$ 0	$ 0			
200201400	Protect, Enhance, and Maintain Habitat on the Sunnyside Wildlife Area to Benefit Wildlife and Fish Assemblages				Columbia Plateau		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$418,874	$398,416	$235,000	Wildlife	Habitat	area
BPA Spent	$ 0	$322,176	$64,426	$ 0			
200201800	Restore Riparian Corridor at Tapteal Bend, Lower Yakima River				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$160,500	$11,000	$158,000	Anadromous	Habitat	point
BPA Spent	$ 0	$ 0	$2,236	$71,999			

Projects in **bold** have preliminary results data included in this report.

Projects in the Yakima Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
200202100	Implement Actions to Reduce Water Temperatures in the Teanaway Basin				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$172,950	$100,825	$53,262	Anadromous	Habitat	stream
BPA Spent	$ 0	$ 0	$80,340	$105,476			
200202200	YKFP Big Creek Passage & Screening				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$175,280	$30,000	$180,000	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$60,426	$47,852			
200202300	Yakima-Klickitat Fisheries Project - Wilson Creek Snowden Parcel Acquisition				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$206,580	$ 0	$206,580	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
200202400	YKFP -- Secure Salmonid Spawning and Rearing Habitat on the Upper Yakima River				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$2,300,000	$69,000	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$ 0			
200202500	Yakima Tributary Access and Habitat Program (Objective 1: Early Actions)				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$1,588,000	$ 0	$ 0	$ 0	Anadromous	Habitat	point
BPA Spent	$ 0	$385,522	$282,744	$ 0			
200202501	**Yakima Tributary Access and Habitat Program (YTAHP)**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$17,500	$750,000	$750,000	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$204,115	$676,957			

Projects in **bold** have preliminary results data included in this report.

Projects in the Yakima Subbasin, continued...

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
200202900	Fish Passage Inventory and Corrective Actions on WDFW Lands in The Yakima Subbasin				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$205,300	$180,300	$205,300	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$50,030			
200203100	**Growth Rate Modulation in Spring Chinook Salmon Supplementation**				**Columbia Plateau**		**yes**
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$313,294	$32,582	$338,859	Anadromous	Research & Evalua-tion	point
BPA Spent	$ 0	$ 0	$400,902	$306,043			
200203800	Protect Normative Structure and Function of Critical Aquatic and Terrestrial Habitat				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$349,000	$360,866	$373,135	Anadromous	Habitat	area
BPA Spent	$ 0	$21,285	$284,546	$216,969			
200205200	Naches River Water Treatment Plant Intake Screening Project				FY 2001 Action Plan		no
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$1,657,500	$ 0	$ 0	$ 0	Anadromous	Habitat	area
BPA Spent	$ 0	$175,431	$624,569	$ 0			
200300100	Yakima-Klickitat Fisheries Project - Manastash Creek Fish Passage and Screening				Columbia Plateau		yes
FY	2001	2002	2003	2004	Type	Category	Accuracy
NPCC Rec	$ 0	$ 0	$632,835	$250,000	Anadromous	Habitat	area
BPA Spent	$ 0	$ 0	$ 0	$82,207			

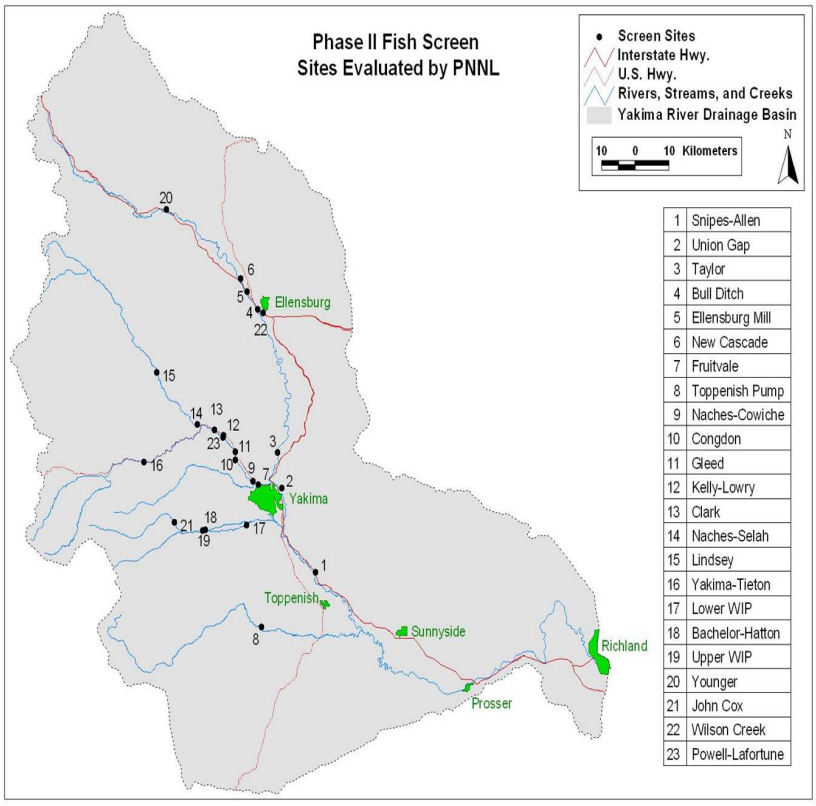
Projects in **bold** have preliminary results data included in this report.

Project 198506200 — *Passage Improvement Evaluations*

2002-2003 Project Objectives

- Determine if screens are designed, operated, and maintained to meet NOAA Fisheries' criteria standards over a wide range of conditions
- Determine if velocities/flows meet NOAA Fisheries criteria
- Determine if screens are effective at protecting fish from injury and from unnecessary migration delay

Preliminary Results



1	Snipes-Allen
2	Union Gap
3	Taylor
4	Bull Ditch
5	Ellensburg Mill
6	New Cascade
7	Fruitvale
8	Toppenish Pump
9	Naches-Cowiche
10	Congdon
11	Gleed
12	Kelly-Lowry
13	Clark
14	Naches-Selah
15	Lindsey
16	Yakima-Tieton
17	Lower WIP
18	Bachelor-Hatton
19	Upper WIP
20	Younger
21	John Cox
22	Wilson Creek
23	Powell-Lafortune

- Most sites met NOAA Fisheries' approach velocity criteria
  - 3 of the 23 had more than 10% of the velocity readings >0.4ft/s
  - sites with problems 3 of 6 years were:
    - John Cox
    - Toppenish Pump
    - Bull Ditch
    - Naches-Selah
    - Gleed
- 13 possible problems reported

The three types of Phase II screens that are evaluated annually are the rotary (left), flat (middle), and traveling belt (right). (Photographs: Courtesy of the Pacific Northwest National Laboratory)

Preliminary Results (Continued)

Screen type	Site	=10% of Approach Velocities > 0.4 ft/s					Bypass Velocities Slower than Sweep Velocities at Least Once					Damaged Screen or Seal					Submergence Outside Criteria at Least Once					Excessive Silt or Debris at Least Once					Bypass Outfall < 1 ft at Least Once				
		'99	'00	'01[a,b]	'02	'03	'99	'00	'01[a,b]	'02	'03	'99	'00	'01	'02	'03	'99	'00	'01	'02	'03	'99	'00	'01	'02	'03	'99	'00	'01	'02	'03
Drum Screens	Bachelor-Hatton		▽					▽				☚		✱			☚	▽		⮭			▽		⮭	⮭					
	Clark																	▽	✱							⮭					⮭
	Congdon		▽	✱	⮭						⮭						☚		✱												
	John Cox		▽		⮭	⮭				⮭	⮭			✱				▽								⮭		▽	✱		⮭
	Kelly-Lowry			✱					✱	⮭	⮭							▽	✱		⮭		▽	✱	⮭	⮭					
	Lindsey										⮭	☚							✱												
	Lower WIP				⮭		☚			⮭	⮭					⮭	☚					☚		✱	⮭	⮭					
	Naches-Cowiche	☚							✱		⮭					⮭									⮭	⮭					
	New Cascade										⮭	☚		✱	⮭		☚	▽	✱				▽	✱	⮭						⮭
	Powell-Lafortune								✱	⮭	⮭					⮭			✱	⮭					⮭	⮭					⮭
	Snipes-Allen							▽	✱	⮭	⮭	☚					☚									⮭					
	Taylor										⮭								✱		⮭			✱	⮭	⮭					
	Toppenish Pump	☚										☚				⮭		▽	✱	⮭	⮭	☚	▽	✱	⮭	⮭			✱		
	Upper WIP									⮭		☚			⮭	⮭	☚	▽				☚	▽		⮭	⮭					
	Wilson Creek								✱	⮭	⮭				⮭				✱					✱							
Vertical Plate Screens	Bull Ditch	☚			⮭																			✱							
	Ellensburg Mill	☚	▽				☚		✱			☚		✱			☚					☚		✱	⮭	⮭					
	Fruitvale		▽								⮭						☚		✱												
	Naches-Selah	☚	▽		⮭	⮭		▽	✱	⮭	⮭	☚														⮭			✱		⮭
	Union Gap	☚	▽				☚		✱	⮭	⮭	☚														⮭					
	Yakima-Tieton				⮭			▽	✱					✱	⮭														✱		
	Younger				⮭									✱																	
Vertical traveling screens	Gleed	☚	▽		⮭	⮭											☚														

a) Based on September data only, except Snipes-Allen, Taylor, Toppenish Pump, Naches-Selah, and Union Gap.
b) No data available for Bachelor-Hatton, John Cox, Lower WIP, New Cascade or Upper WIP.

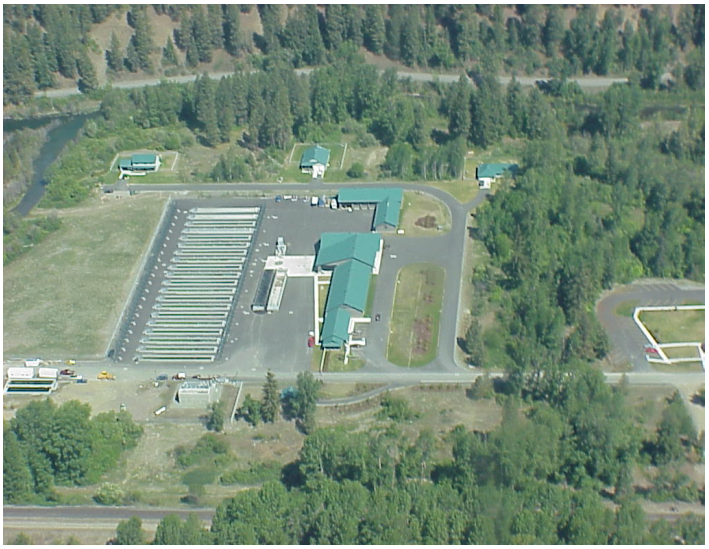
Project 199506325 — *Yakima/Klickitat Fisheries Project Monitoring and Evaluation*

2002-2003 Project Objectives

- Develop and implement methods of detecting indices of increasing natural production, as well as methods of detecting a realized increase in natural production
- Develop methods to detect increases in harvest
- Determine if impacts to non-target taxa can be kept within specific biological limits and determine if biotic interactions limit ability of supplementation to increase natural production

Cle Elum Supplementation and Research Facility—Preliminary Results

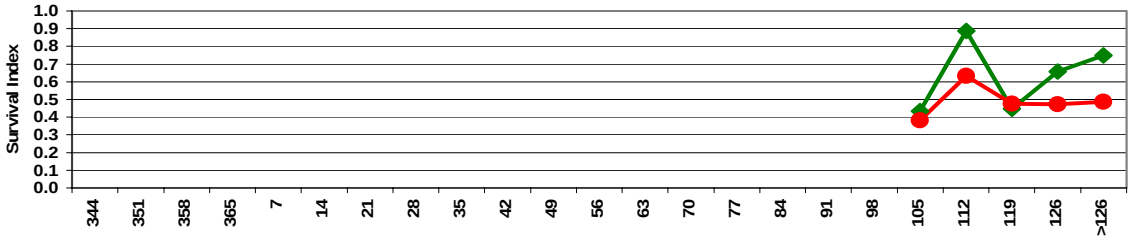
- Increase in the number of spring Chinook salmon returning to the lower Columbia River mainstem and Yakima River
- Increase in the number and spatial distribution of fish returning to spawning grounds in the Upper Yakima basin
- Hatchery-origin fish are returning at smaller size-at-age and may be less successful at producing progeny in the wild than wild/natural fish
- Semi-natural rearing and predator avoidance training have not resulted in significant increases in survival of hatchery fish
- Growth manipulations in the hatchery may be reducing the number of precocious males and increasing the number of migrants



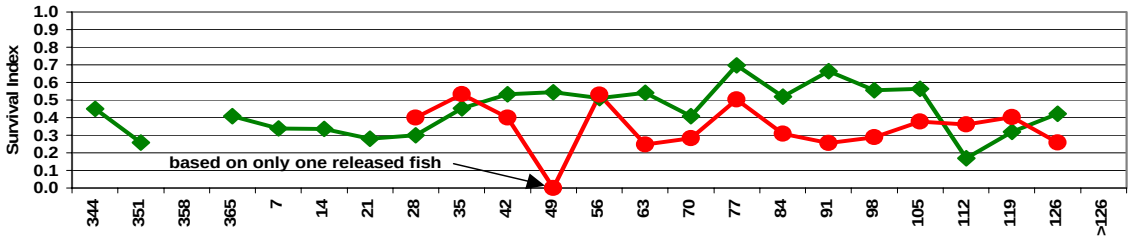
Artificial production facilities at the Cle Elum Hatchery. (Photographs: Courtesy of the Yakama Indian Nation)

Wild and Hatchery Smolt Survival Indices from Rosa to McNary Dams—Preliminary Results

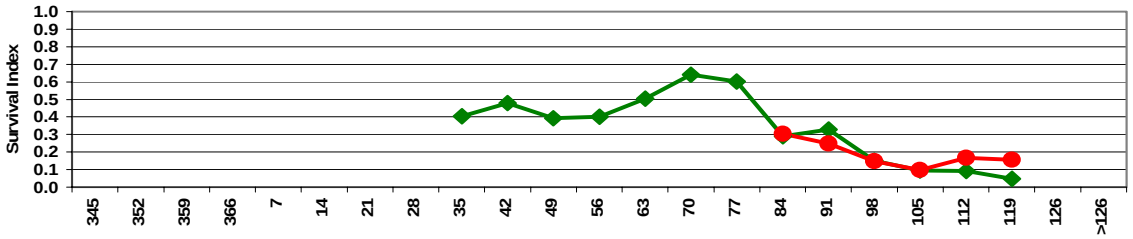
1999 Spring Chinook Roza-Release-to-McNary-Dam Smolt-Survival Index (1997 Brood)



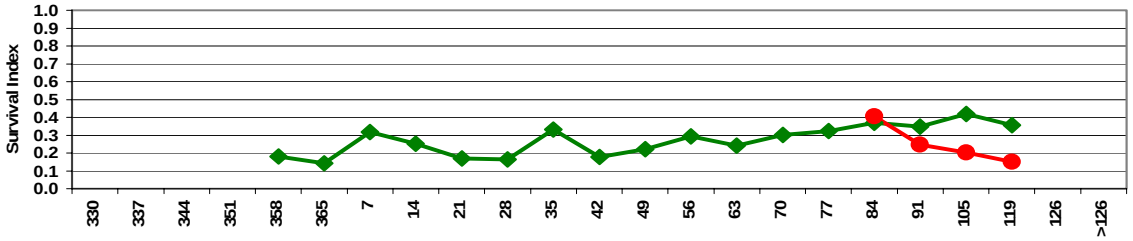
2000 Spring Chinook Roza-Release-to-McNary Dam Smolt-Survival Index (1998 Brood)



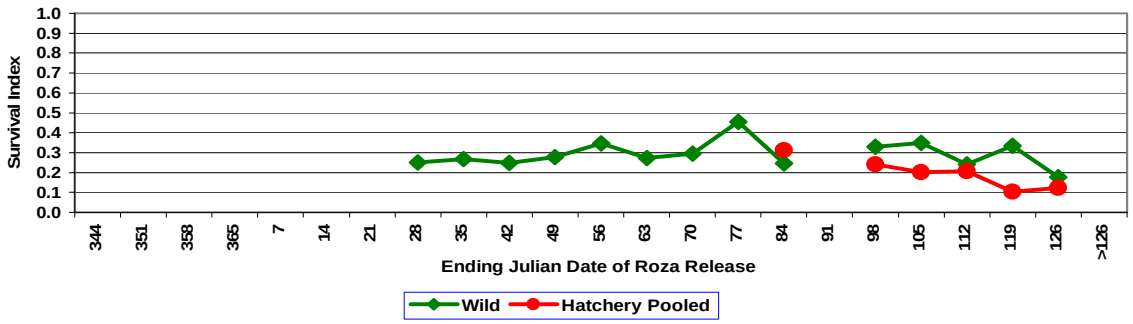
2001 Spring Chinook Roza-Release-to-McNary-Dam Smolt-Survival Index (1999 Brood)



2002 Spring Chinook Roza-Release-to-McNary-Dam Smolt-Survival Index (2000 Brood)



2003 Spring Chinook Roza-Release-to-McNary-Dam Smolt-Survival Index (2001 Brood)



Avian Predation—Preliminary Results

(Photographs: Courtesy of the Yakama Indian Nation)

Hotspot Survey (Average Daily Gull Abundance)

Chandler

- Peak Day: May 9 (average of 67 gulls)
- Overall Average: 8 gulls/day
- Total Fish Consumed: 2002 = 195,279
  2003 = 78,436

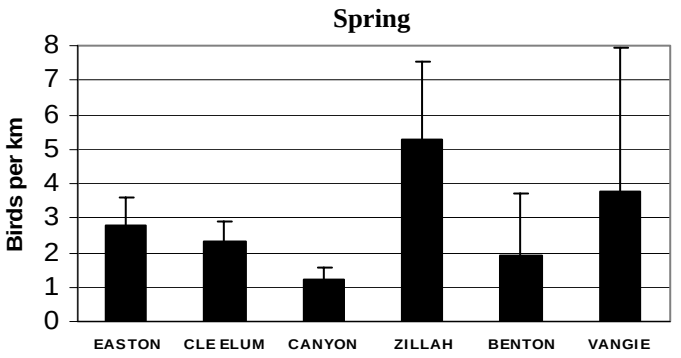
Horn

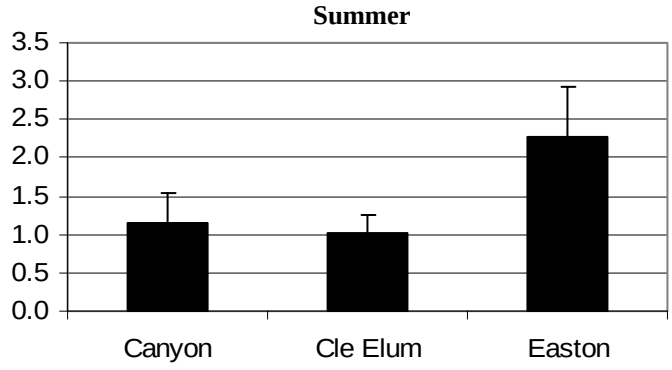
- Peak Day: May 28 (average of 27 gulls)
- Overall Average: 6 gulls/day
- Total Fish Consumed: 2002 = 84,203
  2003 = 62,913

Consumption Estimates

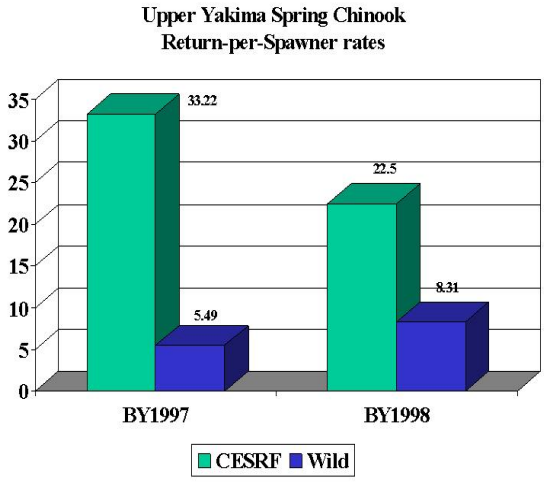
	Stratum1	Stratum 2	Stratum3
Spring	87.5kg/km	30.2kg/km	246.5kg/km
Summer	43.2kg/km	24.1kg/km	

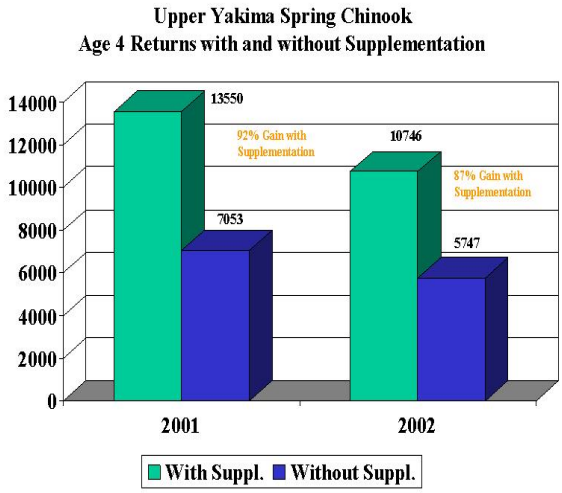
River Reach Survey (Birds per kilometer)





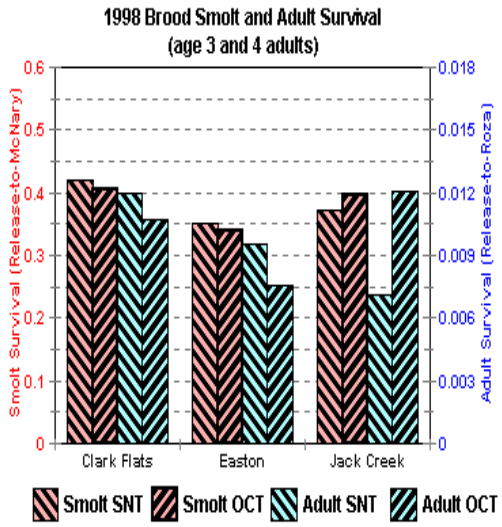
PIT Tag Interrogation (Roza Dam)—Preliminary Results

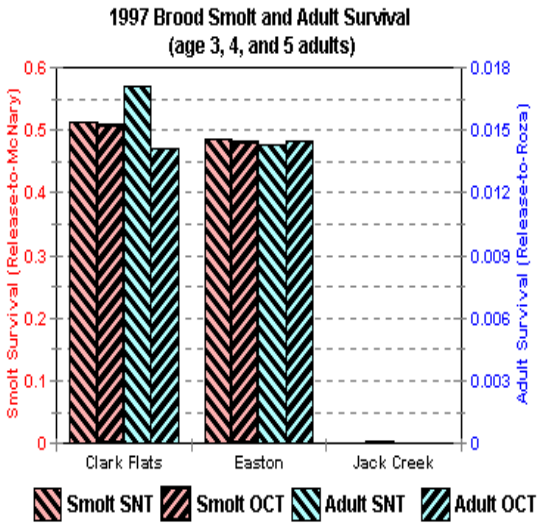




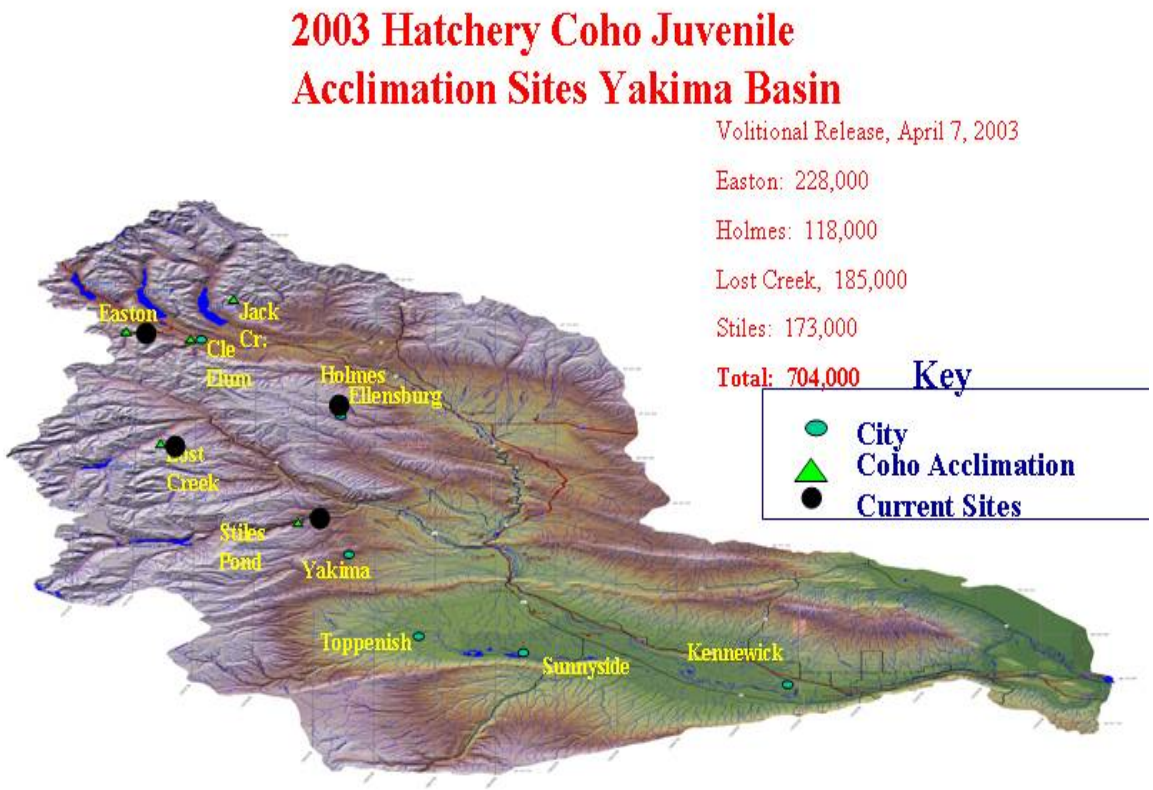
Fish identity confirmed at Roza Dam using PIT tag interrogation. (Photograph: Courtesy of the Yakama Indian Nation)

Brood Smolt and Adult Survival





Coho Reintroduction Feasibility Research —Preliminary Results



2003 Survival Estimates

Juvenile Coho Survival Indices			
Site	**Willard**	**Yakima**	**Mean**
Easton	.0624	.1163	
Holmes	.1353		
Mean Upper Yakima River Survival	.0994	.1163	.1062
Lost Creek	.0895	.2135	.1604
Stiles	.2385	.2588	.2501
Mean Naches River Survival	.1641	.2361	.2052

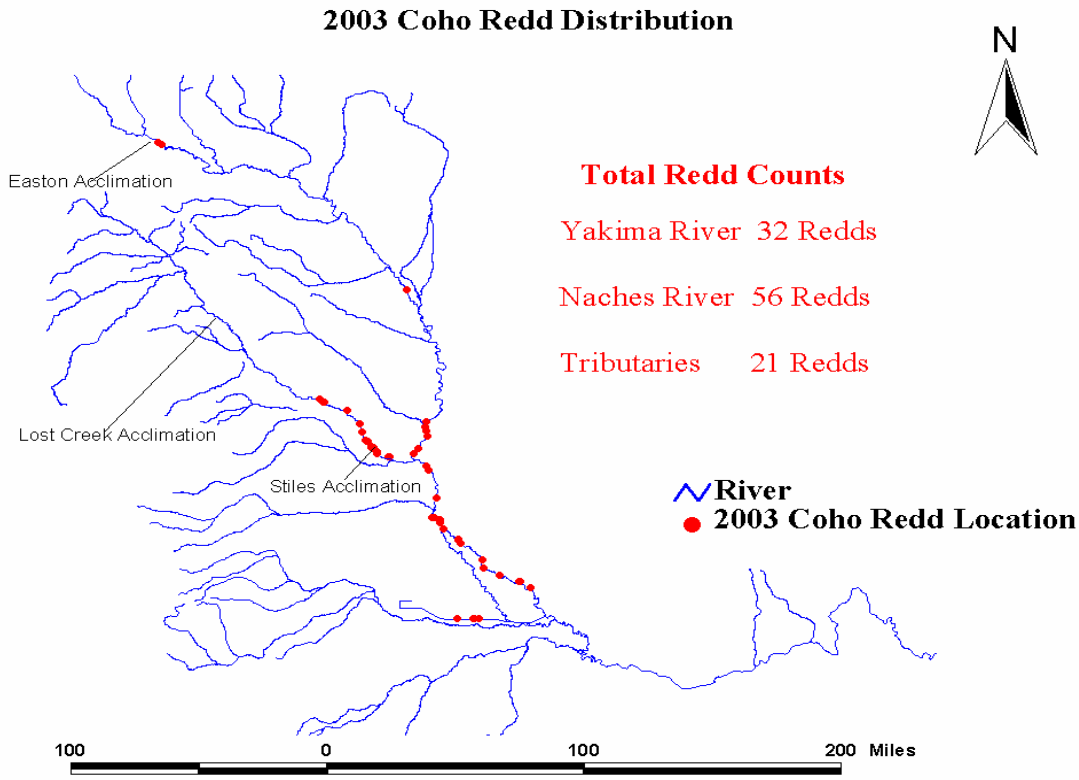
Site Comparisons

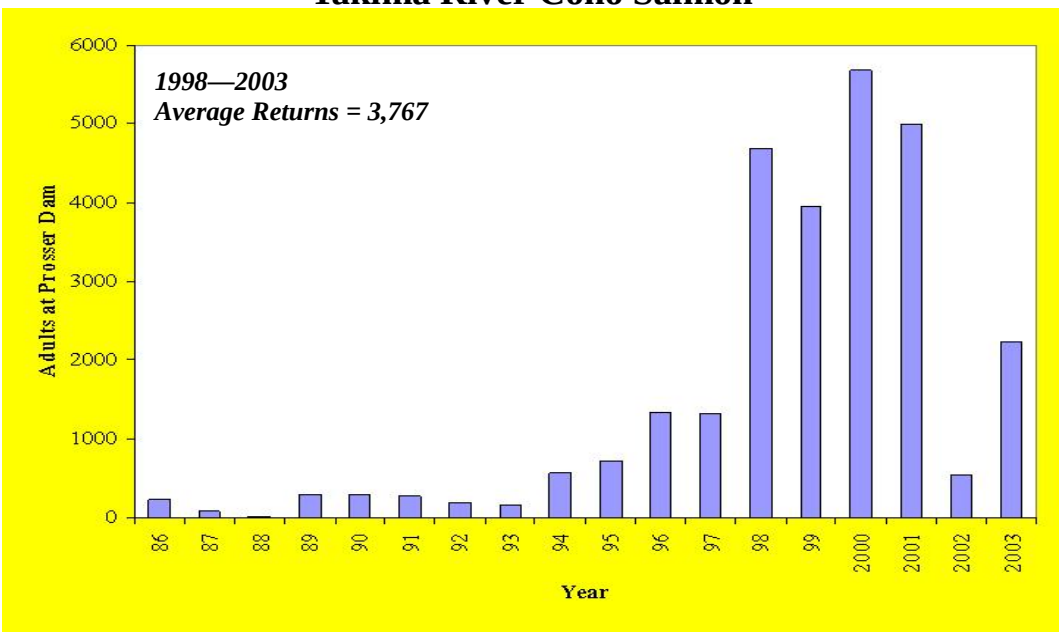
- Detection of fish released from the Naches River site exceeded those released from the upper Yakima River
- Within the Naches River releases, survival of fish released from the Stiles acclimation site exceeded the survival of those released from Lost Creek
- Within the upper Yakima River, survival of fish released from the Holmes acclimation site exceeded the survival of those released from Easton

Stock Comparisons

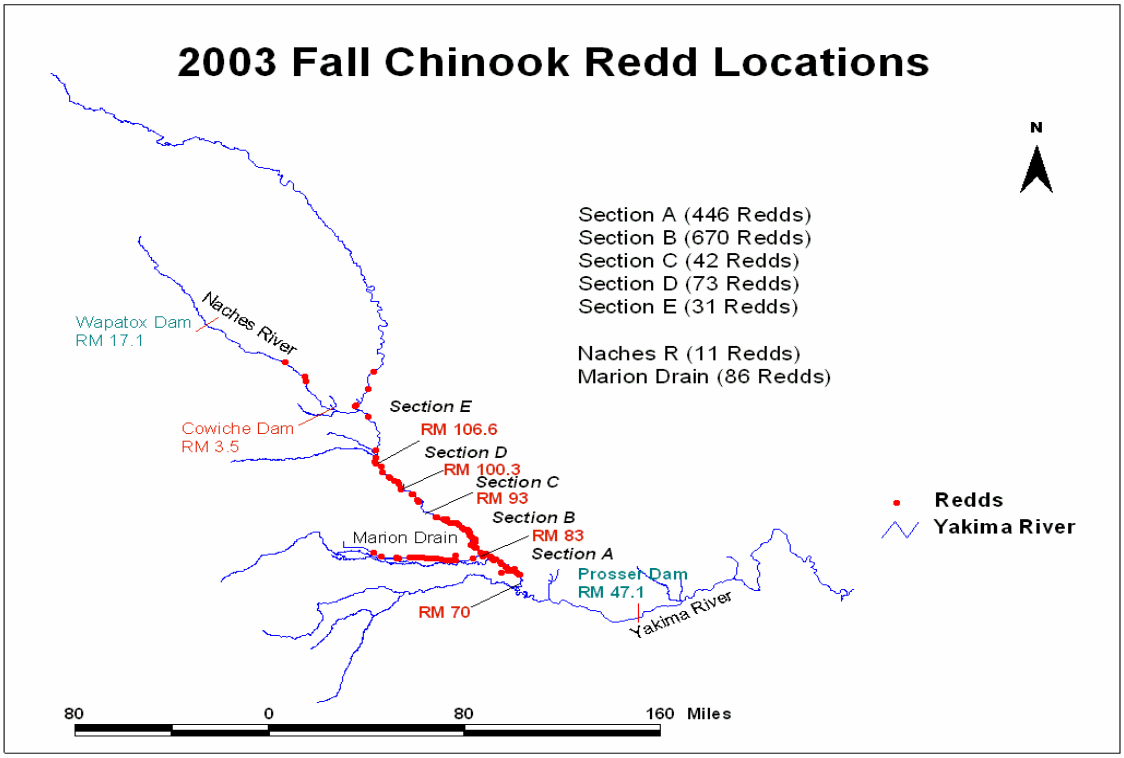
- Yakima stock survival index was greater than that of the Willard stock

Coho Reintroduction Feasibility Research —Preliminary Results





Fall Chinook Salmon Redd Surveys and Escapement —Preliminary Results

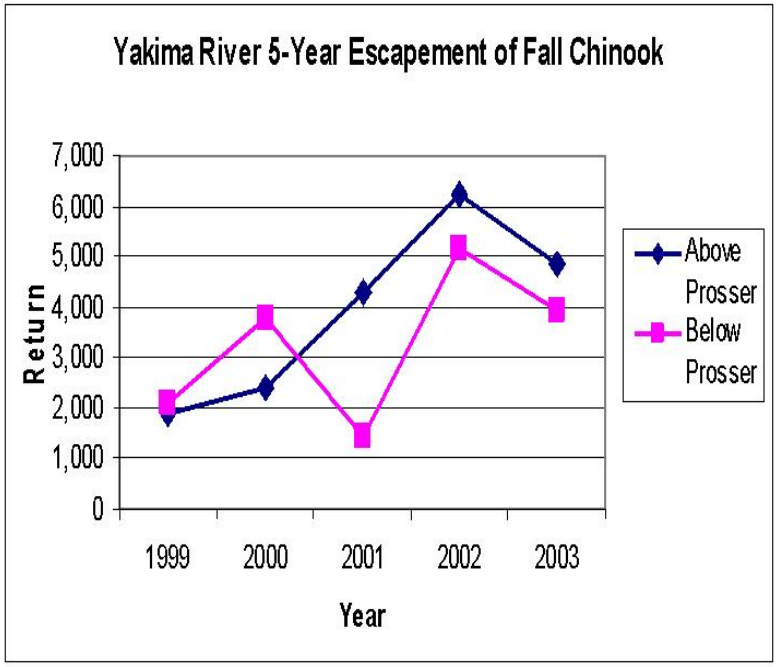


Redd Counts Below Prosser Dam

- 10,251 returning adults
- 61.5% spawned above Prosser
- 794 redds in the Yakima River below Prosser Dam

Redd Counts Above Prosser Dam

- 4,875 returning adults
- 1,271 redds in the Yakima River
- 11 redds in the Naches River
- 86 redds in the Marion Drain

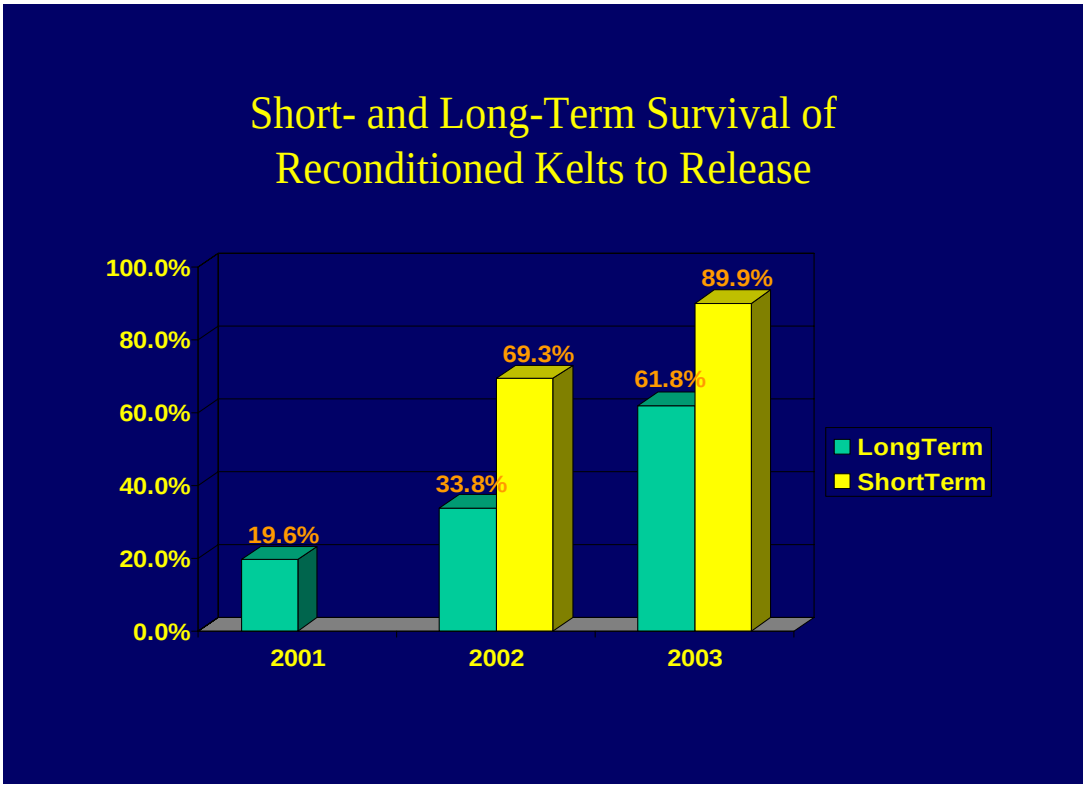


Project 199701325 — *Yakima/Klickitat Fisheries Project Operations and Maintenance*

2002-2003 Project Objectives

- Operate and maintain Prosser Hatchery, Marion Drain Hatchery, Cle Elum Supplementation and Research Facility, Steellhead Kelt Reconditioning Facilities, Lost Creek Coho Acclimation Facility, Stiles Pond Coho Acclimation Facility, Hatchery Slough Coho Acclimation Facility, Easton Coho Acclimation Facility, Easton Springs Chinook Acclimation Facility, Clark Flat Spring Chinook Acclimation Facility, Jack Creek Spring Chinook Acclimation Facility, Roza Broodstock Acclimation Facility, and Prosser Broodstock Collection Facility

Reconditioned Kelts—Preliminary Results



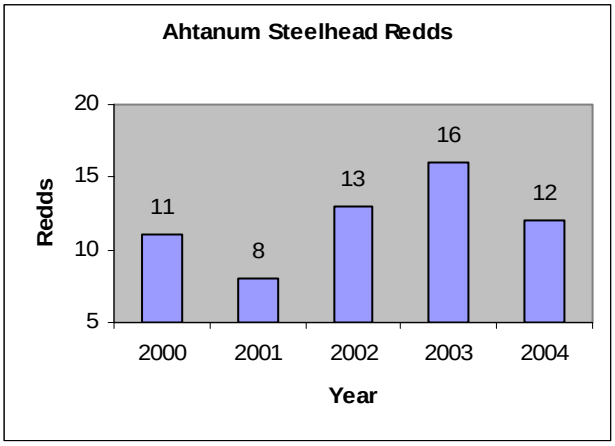
In an attempt to recondition steelhead kelts (left) for later release, the Yakama Nation rears the kelts in tanks (center) from March – December, and release the reconditioned fish (right) in December. (Photographs: Courtesy of the Yakama Indian Nation)

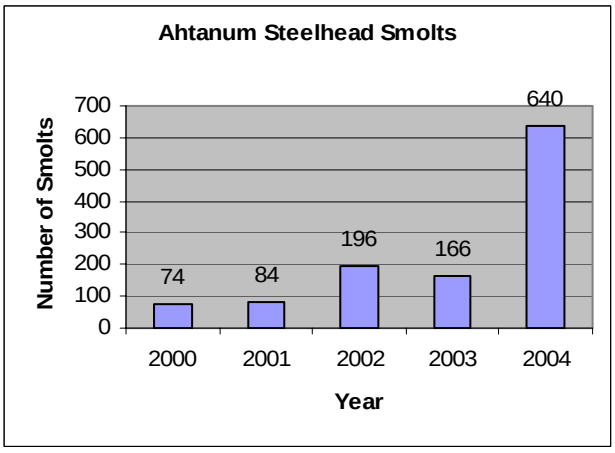
Project 199901300 — *Ahtanum Creek Watershed Assessment*

2002-2003 Project Objectives

- Monitor aquatic ecosystem health and aquatic species assemblages

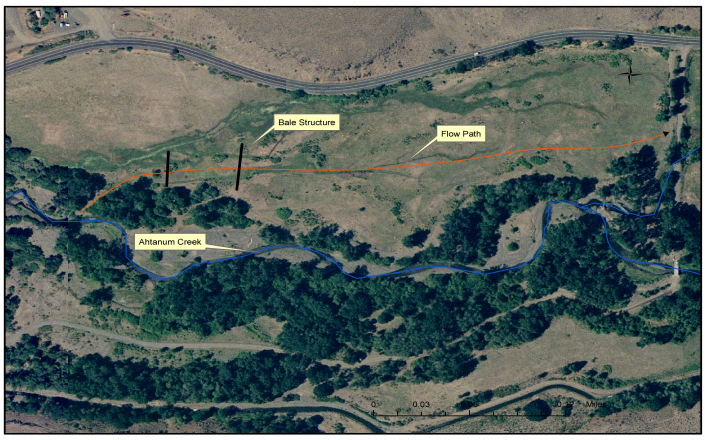
Preliminary Results





- 9 miles of riparian fence completed with 1.5 miles of floodplain completely excluded from grazing
- Implemented solar stock pumps with pipelines for remote stock tanks
- Intensive revegetation
- 10 cfs fish screen installed

Ahtanum Floodplain Structures



To prevent the input of sediment during high flows, hay bales are placed throughout the floodplain in an effort to contain encroachment. (Photographs: Courtesy of the Yakama Indian Nation)

Project 200202501 — *Yakima Tributary Access and Habitat Program*

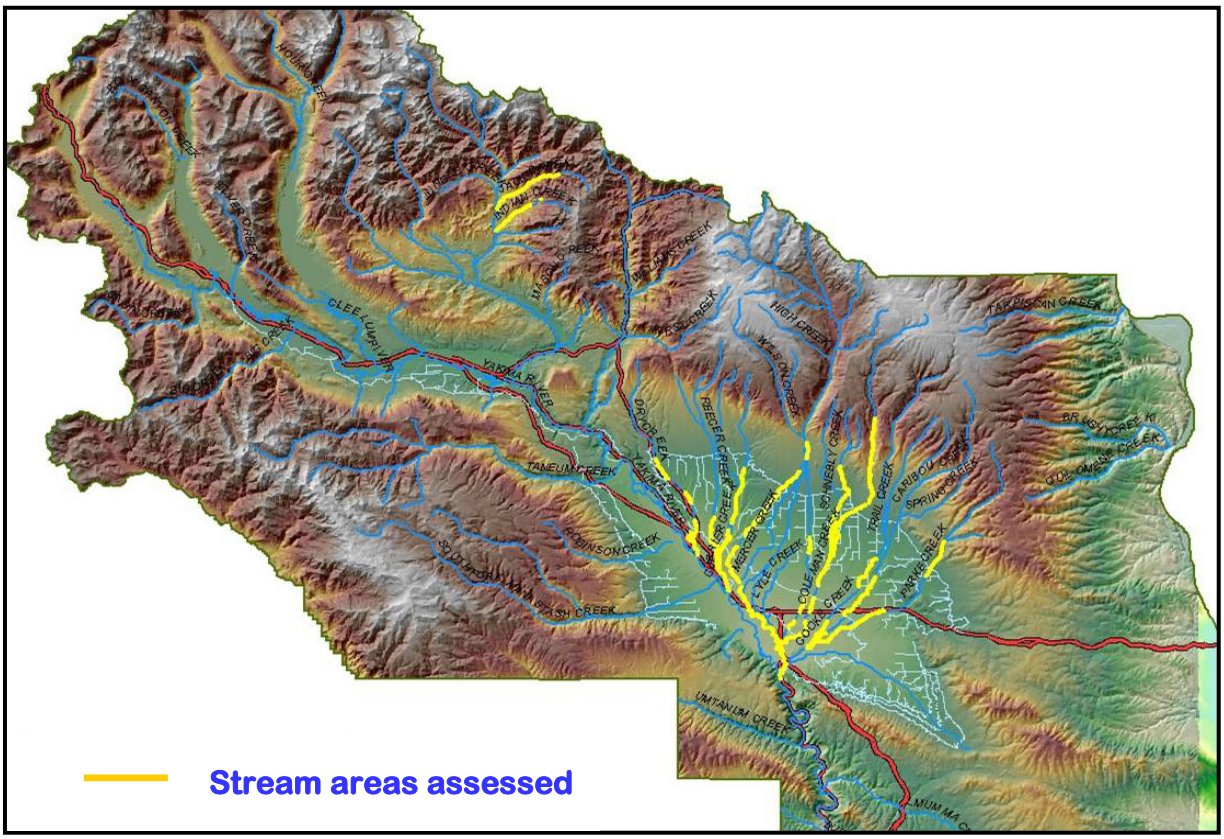
2002-2003 Project Objectives

- Restore salmonid access through early actions and monitor habitat and stream conditions

Early Actions and Stream Assessments—Preliminary Results

- Cooke Creek Siphon
- Ahtanum Diversions 13 and 14
- Coleman, Cabin Creek
- Cowiche Pump Screens

Stream assessments to identify barriers, riffles, and pools will be performed throughout the Kittitas and Yakima drainages. (Photographs: Courtesy of Kittitas County Water Purveyors)



Project 200203100 — *Growth Rate Modulation in Spring Chinook Salmon Supplementation*

2002-2003 Project Objectives

- Estimate the incidence of precocious maturation and maturational physiology in wild Yakima River spring Chinook salmon
- Estimate the incidence of maturation in the Yakima Hatchery

Incidence of Precocious Maturation— Preliminary Results

- An average of 25% (50% of all males) of the Yakima Hatchery Chinook salmon are minijacks

Examples of the differences in size and age of sexually mature Chinook salmon. (Photograph: Courtesy of the NOAA Fisheries)

Minijacks in Yakima Hatchery Chinook

Brood Year	Release #	% of all fish	# Minijacks
97	386,048	22%	84,931
98	589,683	36%	211,107
99	758,789	25%	189,697
00	834,285	18%	153,508
01	370,236	26%	95,520
		Avg. 25%	

Larsen et al.(2004) Trans. Am. Fish. Soc.

Incidence of Precocious Maturation and Growth Rate Modulation— Preliminary Results

Sexual maturation of Age 1+ spring Chinook salon was evaluated examining the testes. (Photograph: Courtesy of the NOAA Fisheries)

Rate of Incidence

- 35-53% (depending on year) of the male Chinook salmon from the Yakima Hatchery program undergo precocious maturation at Age 1+ years compared to 2.9-22% for wild fish

Modulation

- 37-38% reduction in minijacks
- Minijack rate still higher for hatchery fish than wild fish
- Minijack rates in the wild vary annually