

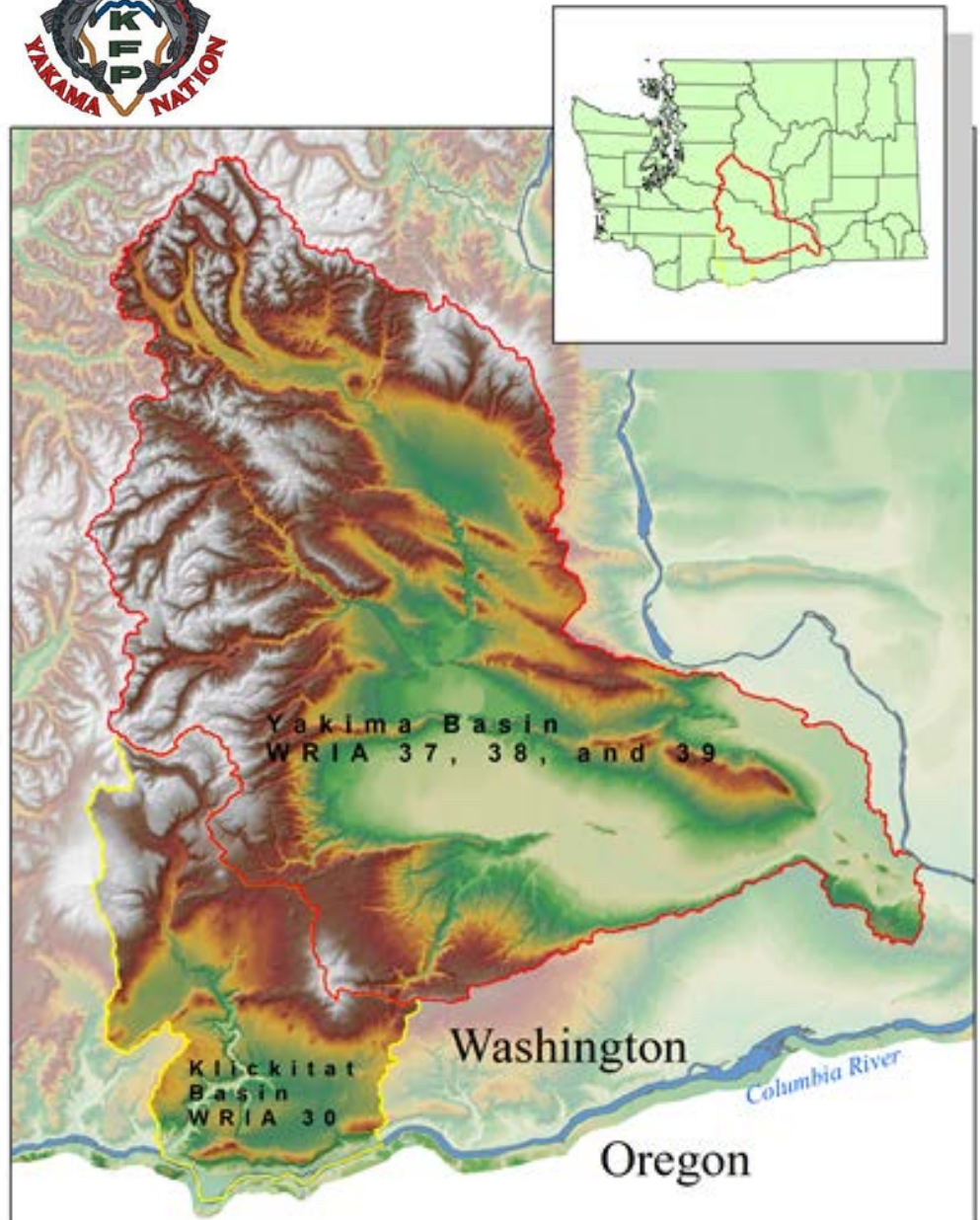


Yakima Klickitat Fisheries Project

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Juvenile Salmonid Predation

- Yakima River Basin
- Yakima River
- Irrigation Diversions
- Great Blue Heron



2009 YN began it's reintroduction of Summer Chinook



176,000 Summer Chinook Released in the
Yakima Basin

30,000 were PIT tagged

1 PIT tag = 6 fish

June 12th release date

PIT Tags – Passive Integrated Transponder Tags

- Detailed info – Origin, Run, Rear....
- In river interrogation sites which track tagged fish

- Based on the 2009 PIT tag numbers, in 2010 PIT tag surveys were continued.
- Surveys focused on areas of known PIT tag concentration due to Salmonid Predation and Mortalities

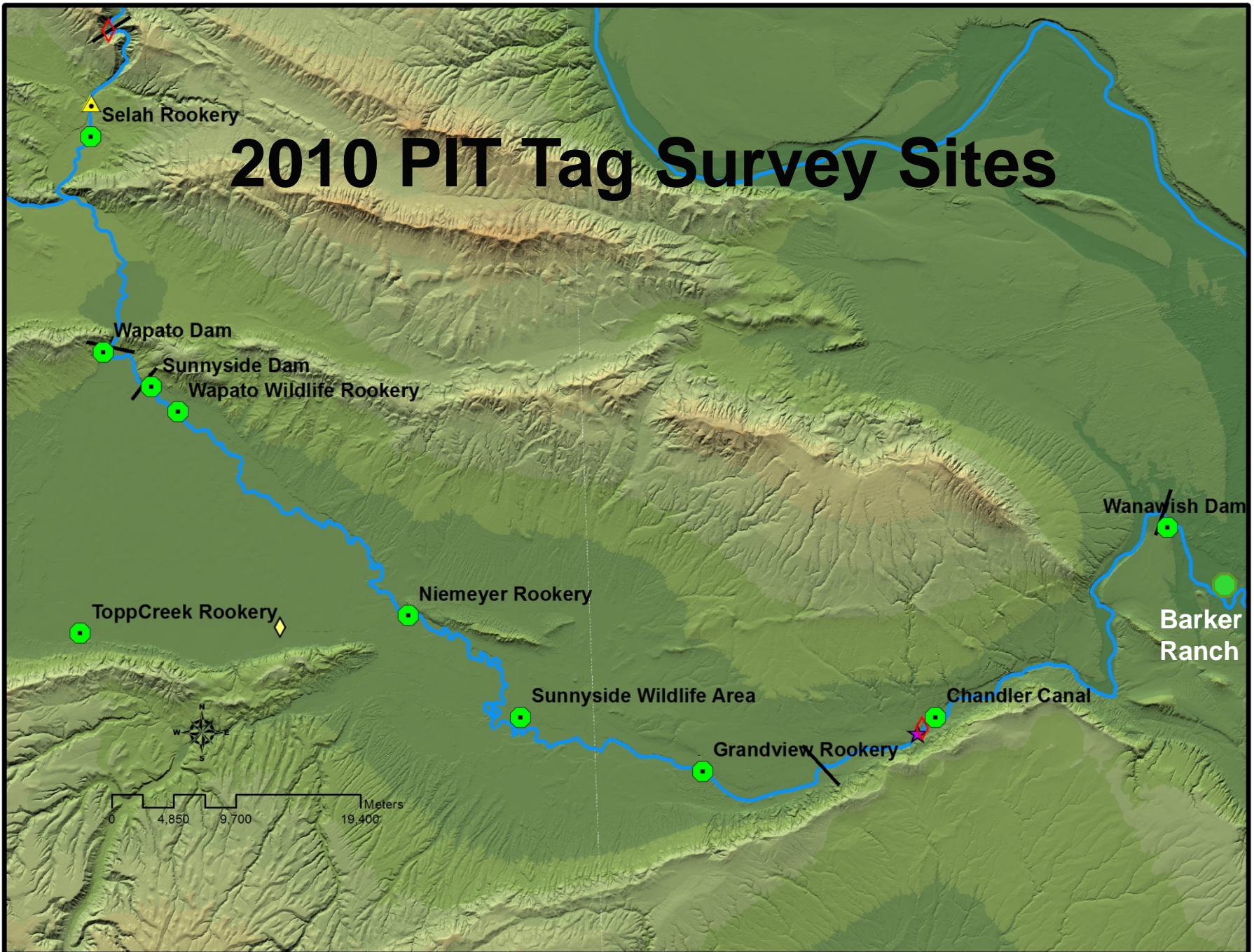
Summer Chinook PIT tags detected for 2009:

Wapato Diversion - 422
Sunnyside Diversion - 444
Chandler Diversion – 365
Wapato Wildlife Rookery -120
Selah Rookery -13
AWPE colony at Badger Island – 201 (PSMFC data)

~1600 Summer Chinook tags found
~10,000 fish accounted for

5% Summer Chinook tags accounted for in Heron Rookeries and Diversions scanned in 2009

2010 PIT Tag Survey Sites



PIT Tag Detections 2010: Irrigation Diversions

- Chandler
- Wapato
- Sunnyside

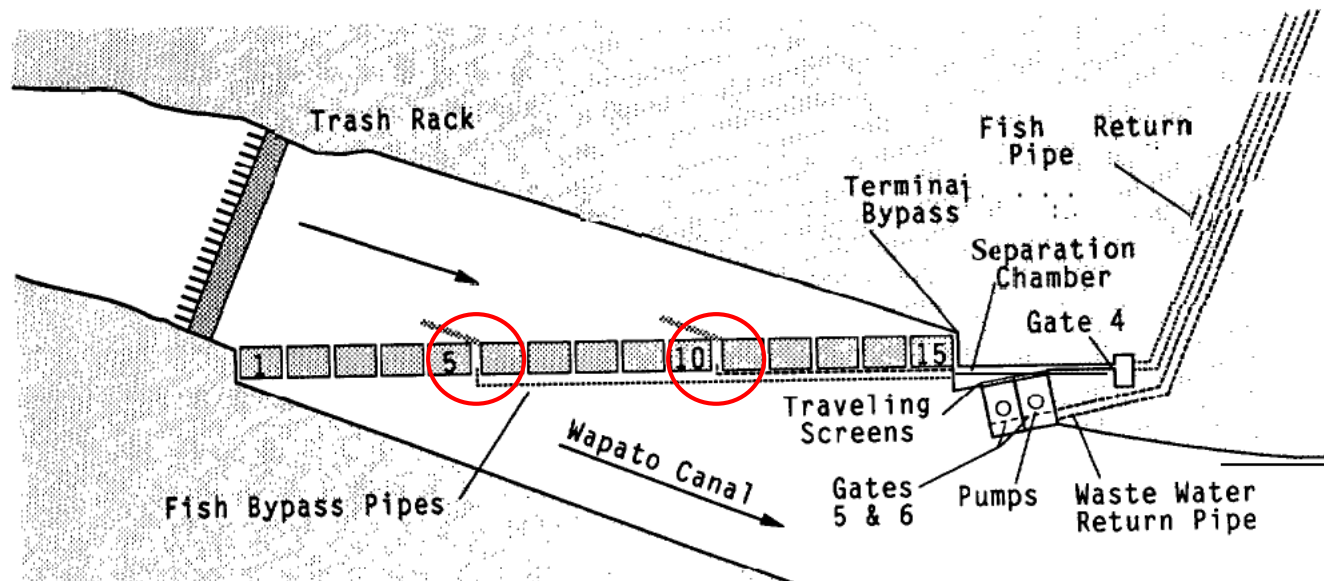


Irrigation Diversion PIT tags

- Conducted in front of fish screens and behind screens
- Timing of scanning coincides with BOR annual maintenance
- Numerous tags behind trash screens
- Underwater cameras behind trash screens show fish predation

Fish Diversions uses rolling screens with a sweeping velocity to direct fish to three bypass pipes

In 2009 the Wapato Screening Facility was discovered to have two of the fish bypass pipes were completely inoperable and one operating less than 15%.



“The fish became passive as a result of fatigue, and eventually became impinged” — *A Fisheries Evaluation of the Richland and Wapato Canal Fish Screening Facilities , Spring 1987*

FIGURE 4. Flow Control Structure and Fish Bypass System in the Wapato Canal Fish Screening Facility



Assuming uniform fish distribution above Sunnyside Dam, about 75% of the fish in the Yakima River may be diverted through the Sunnyside Canal Fish Screening Facility. - *A FISHERIES EVALUATION OF THE SUNNYSIDE CANAL FISH SCREENING FACILITY, SPRING 1985*

- Irrigation Diversions pull ~ 1,000 CFS
- Low flow in the river causes more fish to be entrained in diversions
- Summer Chinook released mid June subject to higher entrainment with lower river flow

Wapato Irrigation Diversion

- 1607 Total number PIT tags
- 587 Migration Year 2009
- 422 Summer Chinook

Sunnyside Irrigation Diversion Forebay

- 1962 Total number of PIT tags
- 575 Migration Year 2009
- 387 Summer Chinook

Sunnyside Irrigation Diversion Aft Forebay

- 312 Total number of PIT tags
- 78 Migration Year 2009
- 57 Summer Chinook

“there has undoubtedly been a net improvement in juvenile fish survival (relative to fish screening facilities) as a direct result of this evaluation program.”-

A Summary of 22 Years of Fish Screen Evaluations in the Yakima River Basin
Summary Report
1985 – 2007

Letter written to the Bureau of Reclamation from the Yakama Nation for failure in fish bypass operations:

- BOR has not been maintaining the fish passage facilities at Wapato Dam
- The Bureau of Reclamation (BOR) has had the responsibility and funding to maintain and operate these fish passage facilities.
- An examination of the facilities showed the juvenile by-pass facilities maintained by Reclamation at Wapato Dam was blocked due to lack of maintenance by Reclamation.
- Yakama Nation may wish to seek restitution and/or other compensation for our losses

2010 Diversion PIT tags

Total PIT Tag numbers much lower at Wapato Forebay, possible impact by Heavy equipment before survey took place

Sunnyside and Chandler numbers are up leading to YKFP's development of various survival studies focused on these diversions

PIT antennas developed for 2011 to aid in gathering entrainment, mortality, and survival of juvenile salmonids entering these diversions.

Chandler Diversion PIT tags: Species by Migration Year					
	Steelhead	Coho	Spring Chinook	Summer Chinook	Fall Chinook
2000			16		2
2001		3	9		5
2002	1		5		
2003		3	28		8
2004		1	33		44
2005		14	44		49
2006	1	19	128		156
2007		113	286		313
2008	3	112	518		280
2009		88	237	664	58
2010	3	21	152	154	114
Total Tags	8	369	1456	818	1029

2009 Migration year: Summer Chinook numbers increased from 365 to 664

Wapato Diversion PIT tags: Species by Migration Year

	Steelhead	Coho	Spring Chinook	Summer Chinook	Fall Chinook
2000		2	6		
2001		5	43		
2002		1	7		
2003		18	11		
2004		6	20		
2005	1	65	176		47
2006		31	25		117
2007		42	34		82
2008	2	78	177		116
2009		81	90	445	
2010		79	60	38	
2011		2			
Total Tags	3	410	649	483	362

Sunnyside Diversion PIT tags: Species by Migration Year

	Steelhead	Coho	Spring Chinook	Summer Chinook	Fall Chinook
2000		21	51		
2001		9	81		
2002		19	52		
2003		35	83		
2004		17	90		2
2005	2	57	226		40
2006		79	142		182
2007	2	109	167		120
2008		133	186		143
2009		87	189	588	
2010		83	125	163	49
2011		1			
Total Tags	4	650	1393	751	536

Rookery PIT tags

Very High numbers at the Wapato Wildlife Rookery

Selah PIT tag numbers down correlate with
Drop in Great Blue Heron numbers

Attempt at time of deposition of PIT tags at
Selah Rookery using Tarps failed

PIT antenna will be constructed in attempts to
Gain time of PIT deposition

Barker Ranch included in survey produced many
Idaho Snake River PIT tags

Wapato Rookery PIT tags: Species by Migration Year

	Steelhead	Coho	Spring Chinook	Summer Chinook	Fall Chinook
2000		75	49		
2001		100	192		
2002	1	72	72		
2003	1	134	112		
2004	4	74	83		2
2005	6	152	156		51
2006		112	82		331
2007	1	190	146		129
2008	1	127	92		93
2009		91	72	123	
2010	1	102	63	186	6
Total Tags	15	1232	1120	309	612

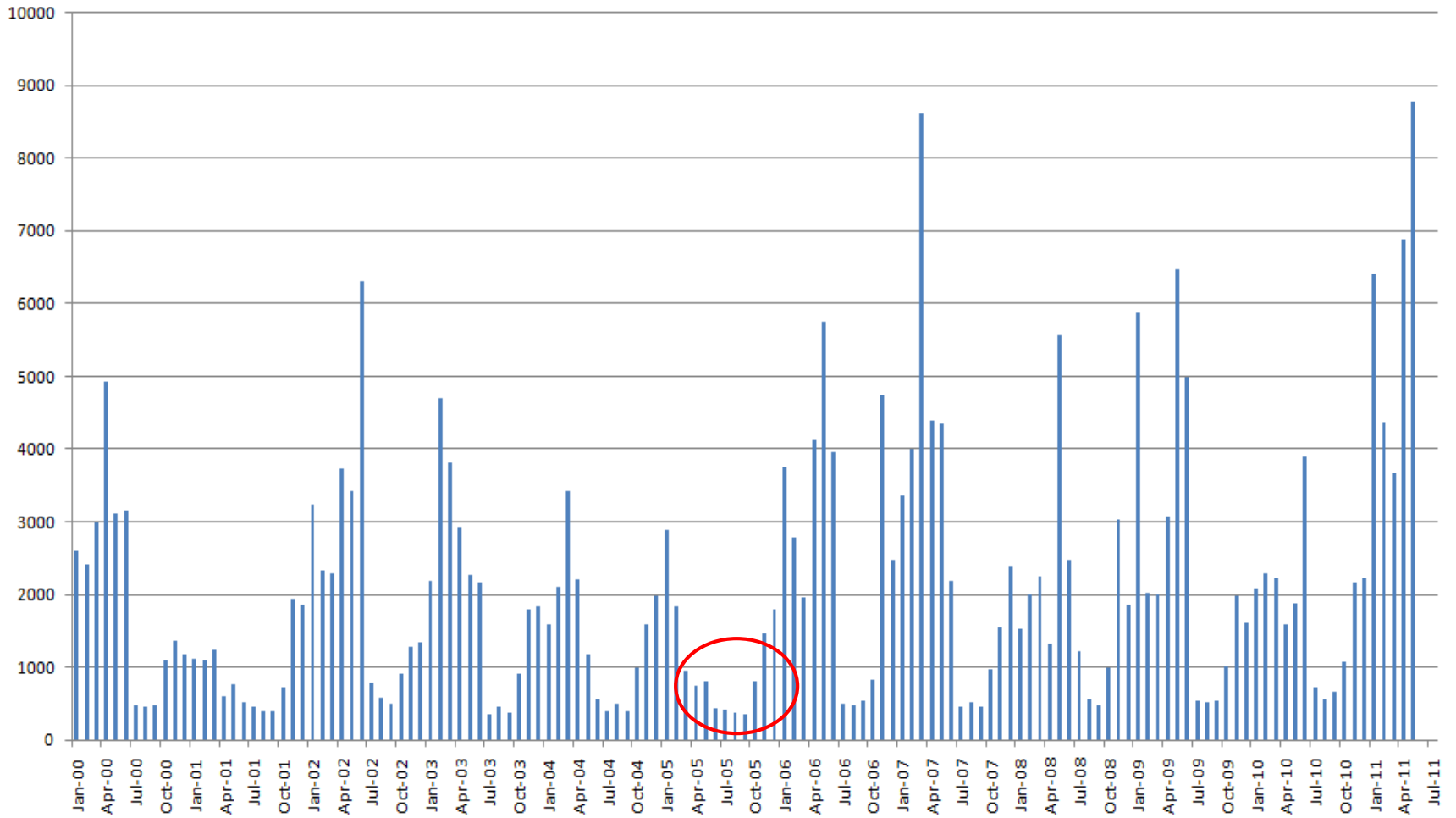
Selah Rookery PIT tags: Species by Migration Year

	Steelhead	Coho	Spring Chinook	Summer Chinook	Fall Chinook
2000		27	41		
2001		23	33		
2002		21	71		
2003		18	44		
2004	1	62	151		
2005		240	223		6
2006		87	168		151
2007		66	66		16
2008	2	176	208		85
2009	3	95	185	14	
2010	1	58	62	29	
Total Tags	7	873	1252	43	258

Conclusions

- Surveyed PIT tag numbers now stand at 23,487
- PIT tags surveyed and Smolt mortality can be linked to Yakima River Flows
- Smolt Mortality linked to late Migration Date as Shown by 2009 failures of Summer Chinook and Summer Chinooks improvement in 2010

Yakima River: Parker Monthly Average CFS



Yakima Basin PIT tags 2007-2010: Species by Migration Year

	Steelhead	Coho	Spring Chinook	Summer Chinook	Fall Chinook
2000		142	195		9
2001		183	421		10
2002	9	126	244		13
2003	24	243	368		32
2004	69	237	551		230
2005	58	831	1160	1	430
2006	9	507	984		1463
2007	22	798	1429		1171
2008	38	1317	1906	1	1756
2009	53	722	1570	2106	181
2010	37	405	594	580	221
2011		3			
Total Tags	318	5517	9424	2688	5516

Questions?