

ANNUAL PROGRESS REPORT

FISH RESEARCH PROJECT  
OREGON

PROJECT TITLE: Middle Fork Willamette Basin Bull Trout Rehabilitation and  
Monitoring Project

PROJECT PERIOD: October 2004 through September 2005

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## INTRODUCTION

Historic distribution of bull trout in the Middle Fork Willamette Basin included the mainstem Middle Fork Willamette River, Salt Creek, North Fork of the Middle Fork Willamette River, Swift Creek, and Staley Creek. Prior to dam construction, bull trout in the Middle Fork Willamette Basin exhibited a fluvial life history pattern. Adults migrated from over-wintering habitat lower in the basin (distribution extended below Dexter Dam) to spawning habitat in the Upper Middle Fork (Swift Creek). Documented juvenile rearing occurred in Swift Creek and in the mainstem Middle Fork downstream from Swift Creek. Construction of Dexter and Lookout Point dams in 1954 and Hills Creek Dam in 1961 by the U.S. Army Corps of Engineers on the Middle Fork Willamette blocked fish passage to and from spawning areas, dramatically altered much of the habitat in the lower river, and eliminated spring Chinook salmon in the upper basin. In addition to dam construction, other factors that adversely affected bull trout in the Middle Fork Willamette include: 1) rotenone poisoning above Hills Creek Dam in 1960 to remove undesirable fish species, 2) high stocking rates of hatchery rainbow trout leading to over harvest of bull trout, and 3) timber harvest and road building practices that degraded spawning and rearing habitat (Oregon Department of Fish and Wildlife and U.S. Department of Agriculture Forest Service 1998).

The last reliable observations of bull trout below Hills Creek Dam were in the Middle Fork Willamette in 1953, Salt Creek in 1960, and the North Fork of the Middle Fork Willamette in 1962. Above the dam the last confirmed bull trout sighting was a photograph taken by an angler in 1990. The Oregon Department of Fish and Wildlife (ODFW) conducted extensive electrofishing and snorkel surveys from 1993 through 1997, but failed to document the presence of bull trout in the Middle Fork Willamette above Hills Creek Reservoir (Hammond and Thelen 1994, Ambrosier *et al.* 1995, Hope and Rose 1996, Rose and Rose 1997). Based on those findings, Buchanan *et al.* (1997) listed the bull trout population in the Middle Fork Willamette as “probably extinct” in a status report of Oregon’s Bull Trout. Subsequently, the Upper Willamette Bull Trout Working Group concluded that bull trout in the Middle Fork Willamette River had a very low probability of persistence without rehabilitation efforts (ODFW and USDA 1998). On June 10, 1998 the U.S. Fish and Wildlife Service (USFWS) listed the Columbia River bull trout distinct population segment as Threatened under the federal Endangered Species Act.

In 1997, prior to listing under the federal Endangered Species Act, ODFW and U.S. Forest Service (USFS) began a cooperative effort to reestablish a viable population of bull trout in the Middle Fork Willamette Basin. The agencies crafted a cooperative Rehabilitation Plan for Bull Trout in the Middle Fork Willamette Basin consisting of six components: 1) transferring bull trout fry from Anderson Creek to the Middle Fork Willamette above Hills Creek Dam, 2) monitoring the McKenzie (donor) population, 3) monitoring the Middle Fork Willamette (recipient) population, 4) limiting angling mortality, 5) habitat restoration and enhancement, and 6) reestablishing the contributions of Chinook salmon to ecosystem function above Hills Creek Dam. Annual fieldwork is coordinated in the Upper Willamette Bull Trout Working Group and in 2005

consisted primarily of monitoring the bull trout population in the Middle Fork Willamette Basin.

In 2000, the USACE submitted a biological assessment on the Effects of the Willamette River Basin Flood Control Project on species listed under the Endangered Species Act to the National Marine Fisheries Service and USFWS. The analysis of the effects concluded that the continued operation of the Willamette Basin Project is likely to adversely affect the Columbia River bull trout distinct populations segment. In 2004, the USACE contracted with the ODFW to begin collecting data on the bull trout in the Middle Fork Willamette Basin. The goal was to acquire data on the Middle Fork population similar to data collected by the ODFW on bull trout inhabiting the South Fork McKenzie above Cougar Dam during the Water Temperature Control Project. Of particular interest to the USACE is the interaction of bull trout with Hills Creek Dam and Reservoir. This annual progress report completes the reporting requirement identified in Task Order FWS2005-01.

## **OBJECTIVES**

### **OBJECTIVE 1. Determine distribution and life history traits of bull trout in the Middle Fork Willamette River.**

Task 1.1. Monitor migration of adult and juvenile bull trout in the Middle Fork Willamette above Hills Creek Reservoir.

*Juvenile Bull Trout:* We set minnow traps baited with salmon eggs and PIT-tagged 103 juvenile bull trout longer than 100 mm FL with the help of USFS staff from the Middle Fork Ranger District. We operated a stream-width PIT tag detector in the Middle Fork Willamette above Swift Creek (RM 258) from March 17 through November 18 (Figure 1) and detected seven of these fish (Figure 2). We also detected six of the 42 juvenile bull trout PIT tagged in Iko and Indigo springs in 2004. The number of days between tagging juvenile bull trout in Chuckle, Iko, and Indigo springs and detecting them downstream in the Middle Fork Willamette at Swift Creek, a distance of little more than 1 to 3 miles, ranged from 12 to 368 days (APPENDIX A).

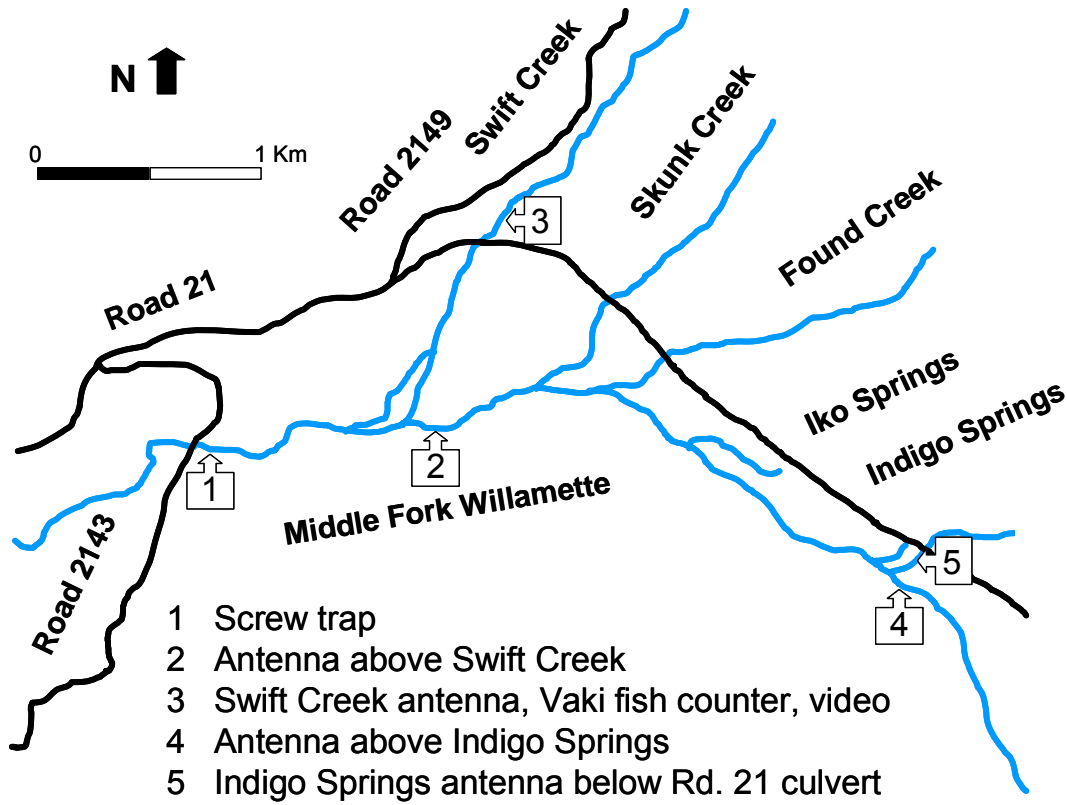


Figure 1. Locations of PIT tag detectors, Vaki fish counter, video recorder and screw trap.

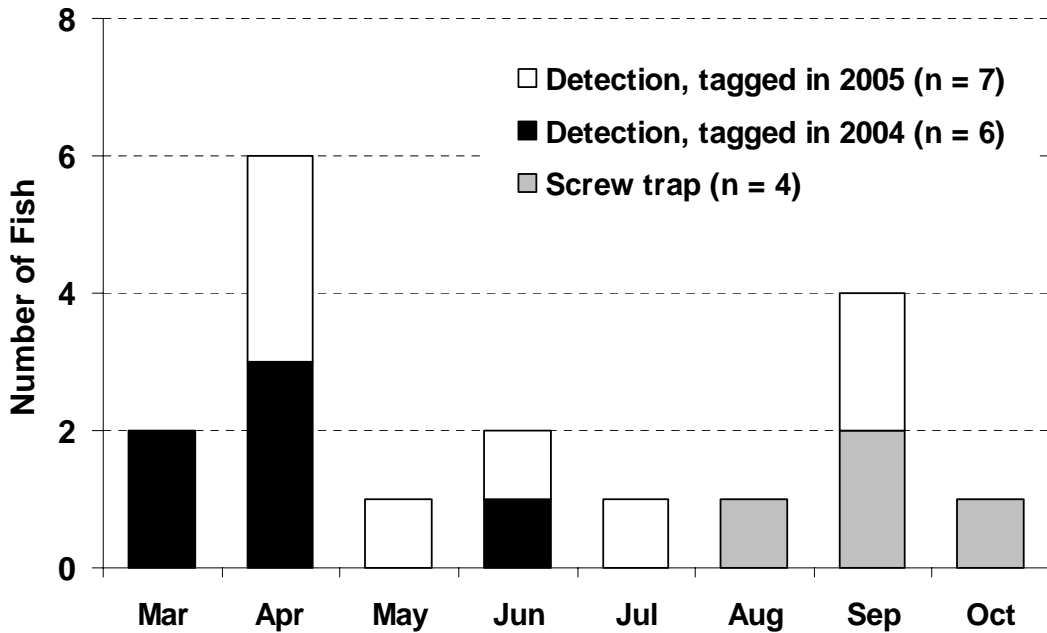


Figure 2. Timing of juvenile bull trout PIT tag detections (RM 258) and captures in the screw trap (RM 257) in the Middle Fork Willamette River, 2005.

We operated a screw trap in the Middle Fork Willamette just above the Road 2143 Bridge (RM 257) from August 29 through October 20 and caught one PIT tagged and three untagged juvenile bull trout (Figure 2). These fish ranged from 130 to 170 mm FL. We tagged one of these fish in Indigo Springs on June 23 (128 mm FL), detected it below the Indigo Springs culvert on July 27, detected it in the Middle Fork Willamette above Swift Creek on September 9 and caught it in the screw trap on September 20 (140 mm FL). This fish grew at a rate of 4.9 cm per year.

We detected most juvenile bull trout downstream from where we tagged them. However, based on tag detections, two juvenile bull trout moved upstream. We detected one juvenile bull trout (102 mm FL) that we tagged in Iko Springs, downstream in the Middle Fork Willamette on July 29, and then detected it upstream in Swift Creek above the Road 21 Bridge on August 8. The Vaki Riverwatcher did not count any fish on this date, but the Vaki does not work well for fish less than 250 mm long. We detected another juvenile tagged in Iko Springs (177 mm FL) upstream in the Middle Fork Willamette above Indigo Springs on September 21. This fish may have been a mature male like the ones we often observe in Anderson Creek or another explanation may be cannibalism of juveniles by adult bull trout as they migrate upstream to spawn. We captured one adult in the screw trap that we believe ate a PIT tagged juvenile.

*Adult Bull Trout:* We planned to radio tag two adult bull trout in the early spring and track them to their spawning locations. We fished a sinking trap net near the head of Hills Creek Reservoir for nine nights from mid April through mid May, but did not catch any bull trout. We captured one bull trout by angling near the head of Hills Creek Reservoir in May, but this fish was too small to radio tag (32 cm FL), and probably would not have spawned in 2005. By mid July, we decided it was too risky to radio tag adults because they would be spawning soon, however, we continued to PIT tag adults, because it is less invasive than radio tagging. ODFW and USFS staff from the Middle Fork Ranger District angled and PIT tagged nine bull trout in 2005.

We operated four stream-width PIT tag detectors above Hills Creek Reservoir and fished a screw trap to monitor movements of adult bull trout (Figure 1). USFS staff from the Middle Fork Ranger District maintained the PIT tag detector in Swift Creek. We detected nine adult bull trout at the antenna in the Middle Fork Willamette above Swift Creek between August 27 and October 1, and three of those same fish at the antenna in the Middle Fork Willamette above Indigo Springs between September 8 and September 27 (Figure 3). We captured 12 adults in the screw trap between August 30 and October 12, some more than one time. We captured one fish three times and three other fish two times, indicating that some fish moved up and downstream more than one time at the trap site. The time from when we first observed or tagged adult bull trout above the Road 2143 Bridge until their last capture or detection above the Road 2143 Bridge ranged from 14 to 58 days.

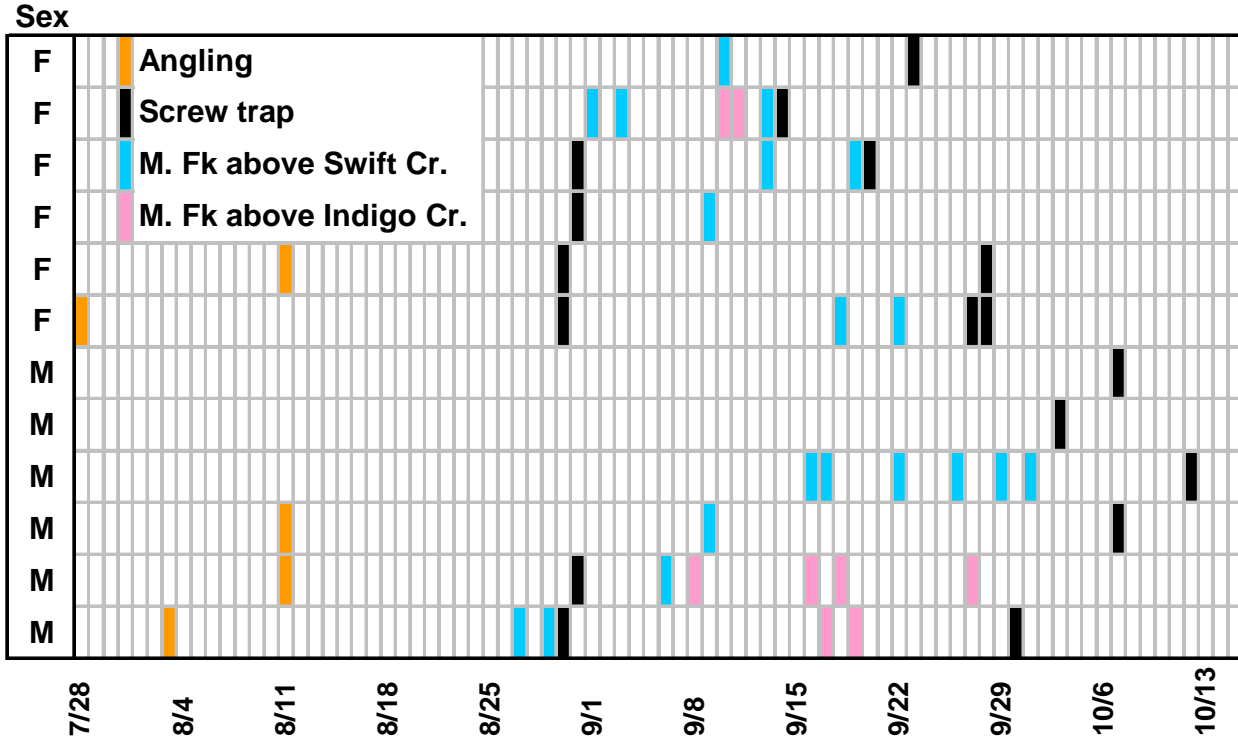


Figure 3. Timing of captures of adult bull trout by angling above the Road 2143 Bridge and in the screw trap above the Road 2143 Bridge (RM 257), and detections at the PIT tag detector in the Middle Fork Willamette above Swift Creek (RM 258), and at the PIT tag detector in the Middle Fork Willamette above Indigo Springs (RM 260).

Task 1.2. Determine distribution of juvenile bull trout above Hills Creek Reservoir.

We set minnow traps baited with salmon eggs and captured a few juveniles in the Middle Fork Willamette near the confluence of Found Creek, Swift Creek, and Iko Springs, but did not capture any in 33 traps set near the confluence of Indigo Springs or 49 traps set near the confluence of Chuckle Springs (Figure 4, Table 1). We also caught juvenile bull trout in Chuckle Springs, Found Creek, Iko Springs, Indigo Springs, and Swift Creek just below Bear Creek. The highest catch rate for juvenile bull trout, as measured by fish per trap, occurred in Indigo Springs. We did not capture other fish species in this area. The catch of juvenile bull trout was low in Bear and Swift creeks both of which received fry from Anderson Creek in 2004. The highest catch rate for cutthroat trout occurred in Swift Creek. We caught juvenile brook trout in the Middle Fork Willamette, one near the confluence of Chuckle Springs and one near the confluence of Swift Creek.

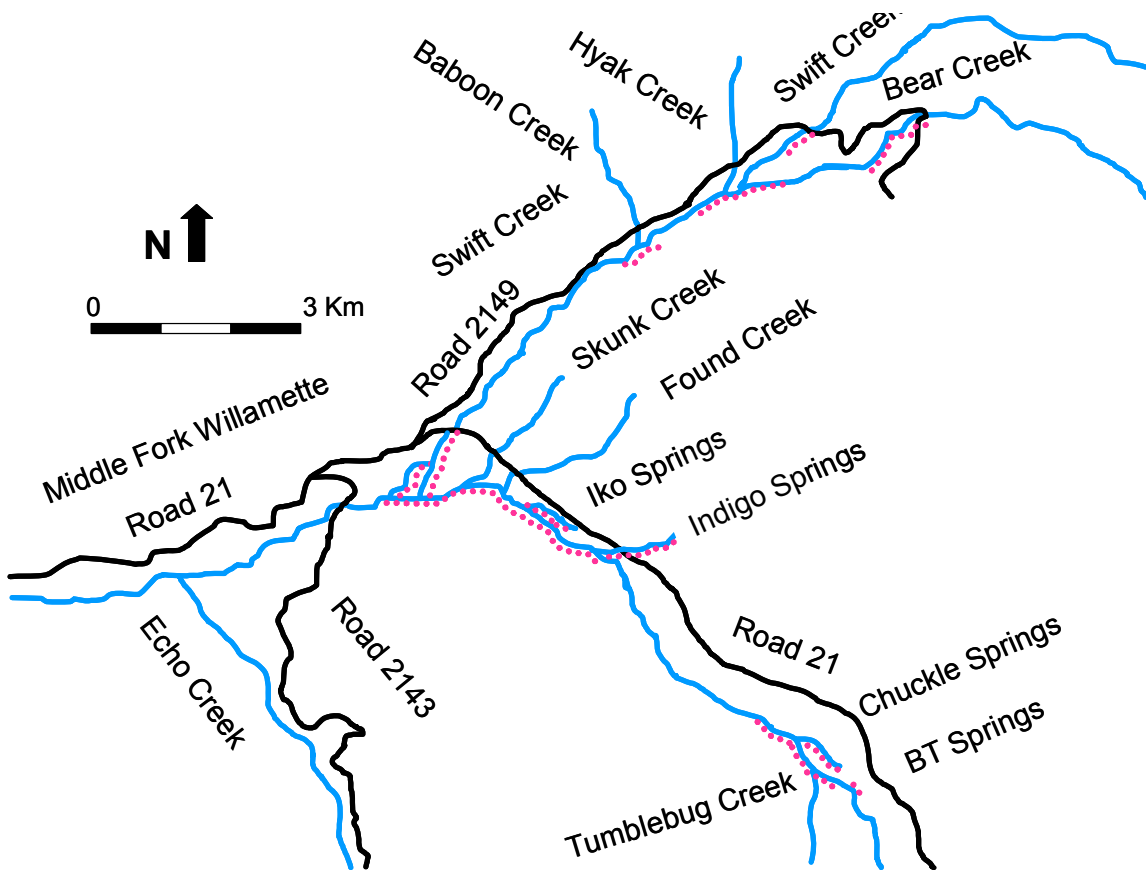


Figure 4. Areas sample with minnow traps are indicated by pink dots.

Table 1. Number of juvenile bull trout captured, PIT tagged, and recaptured by location.

Location	Number of traps	< 100 mm FL	Tagged > 100 mm FL	Recaptured > 100 mm FL	Fish / minnow trap	
					Bull trout	Cutthroat
Bear Creek	33	0	0	0	0.00	1.36
BT Springs	19	0	0	0	0.00	0.58
Chuckle Springs	202	36	16	4	0.28	0.59
Found Creek	26	0	1	0	0.04	1.27
Iko Springs	400	3	45	19	0.17	1.50
Indigo Springs above Rd 21	199	14	35	54	0.52	0.00
Middle Fork Willamette	158	5	5	1	0.07	1.18
Swift Creek	200	1	1	0	0.01	2.25
Total	1,237	59	103	78	0.19	



We released bull trout fry into Chuckle Springs in 1997 through 2004, into Iko Springs in 1998 through 2005 and into Indigo Springs in 1997, 2001 and 2003 through 2005. The length frequency distribution of juvenile bull trout from these areas suggests the presence of multiple age classes (Figure 5).

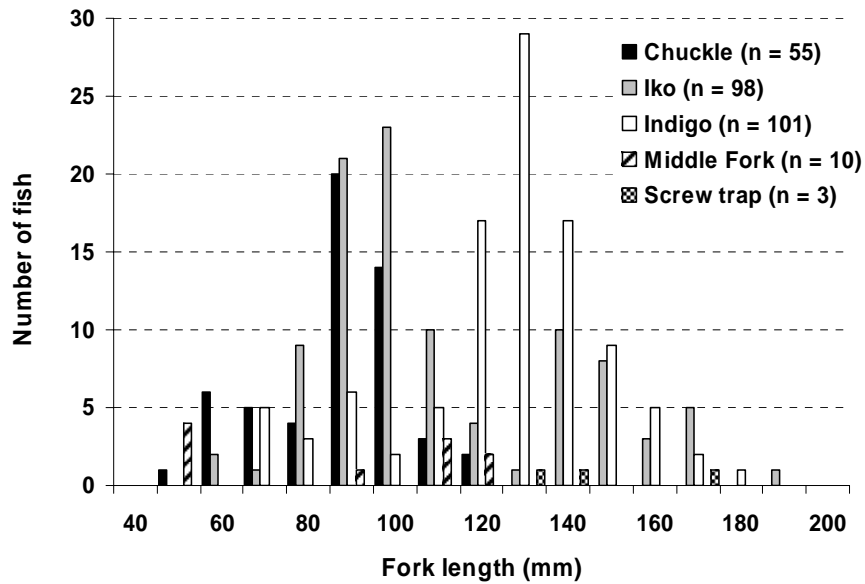


Figure 5. Fork length of juvenile bull trout caught in minnow traps set in Chuckle, Iko and Indigo springs, and Middle Fork Willamette River, and caught in a screw trap in the Middle Fork Willamette above the Road 2143 Bridge (RM 257).

Water temperatures in Chuckle, Iko and Indigo springs, and Bear Creek appear to be suitable for bull trout spawning and juvenile rearing (Figure 6). Water temperatures in Swift Creek near the Road 21 Bridge are too warm for bull trout spawning. The temperature recorder in Swift Creek near the mouth of Bear Creek failed in 2005. We plan to collect additional water temperature data in Bear and Swift creeks in 2006.

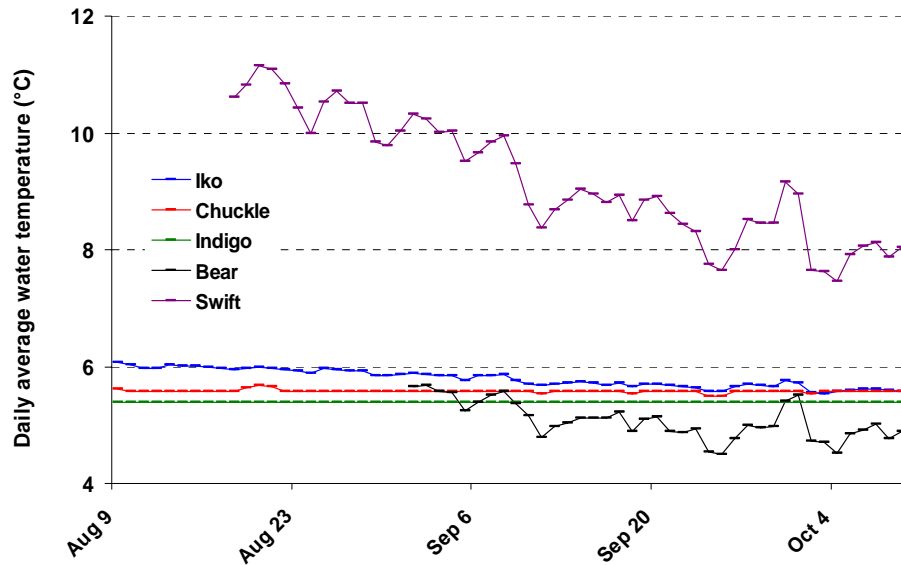


Figure 6. Daily average water temperatures (C°) for Iko, Chuckle, and Indigo springs, Bear Creek, and Swift Creek just above the Road 21 Bridge.

Task 1.3. Document the presence of bull trout below Hills Creek Dam.

We did not find bull trout below Hills Creek Dam. We angled below Hills Creek Dam March 29, April 12, May 9 and 17 and June 1, and did not catch any bull trout. We operated a stream-width PIT tag detector below Hills Creek Dam in the tailrace above the confluence of the regulating outlet channel from March 17 through August 11, 2005 (Photograph 1) and did not detect any bull trout. The antenna anchor failed during reservoir draw down in mid September and high flows precluded rebuilding the antenna. We did not snorkel below the dam because the water is always turbid.



Photograph 1. PIT tag antenna below Hills Creek Dam.

**OBJECTIVE 2. Monitor the abundance of bull trout in the Middle Fork Willamette basin (recipient population).**

Task 2.1 Estimate the number of bull trout above Hills Creek Dam using the various sampling techniques in Task 1.1 and PIT tag recapture rates.

*Juvenile Bull Trout:* We used a standard Jolly-Seber capture-recapture model for open populations (Jolly 1965, Seber 1965) to estimate the number of juvenile bull trout longer than 100 mm FL rearing in Chuckle Springs, Iko Springs and Indigo Springs above the Road 21 culvert (Table 2). We computed estimates using the computer program JOLLY (Polluck et al. 1990) with the bias corrected formulae of Seber (1973). We set minnow traps baited with salmon eggs and PIT tagged juvenile bull trout longer than 100 mm FL. We counted fish PIT tagged in 2004 as new captures. We could not compute an estimate for Chuckle Springs because we were not able to catch and mark enough fish.

Table 2. Estimated number of juvenile bull trout longer than 100 mm FL in Iko and Indigo Springs.

Location: Dates	Traps set	Estimated number of fish	95% Confidence Interval	
			Min.	Max.
<i>Iko Springs:</i>				
Apr 5-7	134	--		
Apr 26-28	76	60	0	143
May 10-11	50	19	2	36
Jun 14-16	95	14		
Sep 20-21	45	--		
<i>Indigo Springs:</i>				
Mar 16	29	--		
Apr 20	29	32	11	52
May 5	30	19	11	28
Jun 2	30	20	11	28
Jun 23	30	23	15	30
Sep 22	12	--		

*Adult Bull Trout:* We fished a 5-foot diameter screw trap in the Middle Fork Willamette above the Road 2143 Bridge from August 29 through October 20 to catch adult bull trout migrating downstream after spawning. We fit a 5-foot diameter culvert connected to a V-shaped weir that extended upstream from the trap to within 5 feet of the bank to the upstream end of the trapping cone (Photograph 2). The weir funneled fish moving downstream into the trap and directed fish moving upstream around the trap.



Photograph 2. We cut off the top half of the downstream portion of the culvert and the culvert extends downstream under the #1 and #2 beams of the screw trap to within about an inch of the trapping cone. The V-shaped weir extends from the upstream end of the 5-foot diameter culvert to within 5 feet of the bank.

We determined sex and sexual maturity by the presence or absence of secondary sexual characteristics, such as spawning coloration and morphology, presence of milt and an external examination of the cloaca. Females had a distended cloaca (Photograph 3).



Photograph 3. Distended cloaca of a sexually mature female.

We caught 14 bull trout longer than 20 cm FL in the screw trap from August 30 through October 12. Twelve of these bull trout were sexually mature (six females and six males) and two were immature. Sexually mature fish ranged in length from 41 to 66 cm and immature fish ranged from 23 to 31 cm (Figure 7). We detected two adult-sized bull trout above the trap that we subsequently did not capture in the trap. These fish may have died or moved downstream past the screw trap without being captured. We also did not detect or capture two fish tagged below the screw trap in 2005, one 32 cm FL tagged May 5 and the other 49 cm FL tagged August 15. The smaller fish probably did not mature in 2005, and the other fish was not mature, died after tagging or was illegally harvested. We caught and detected two of the three bull trout tagged in 2004.

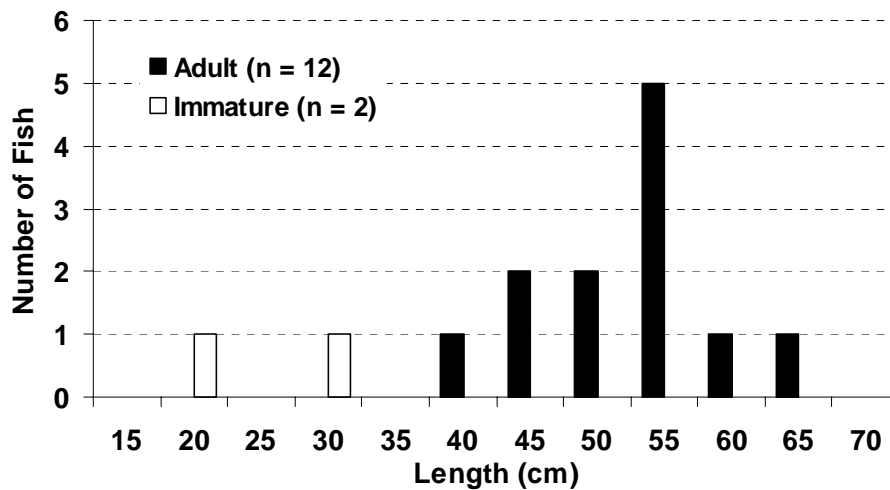
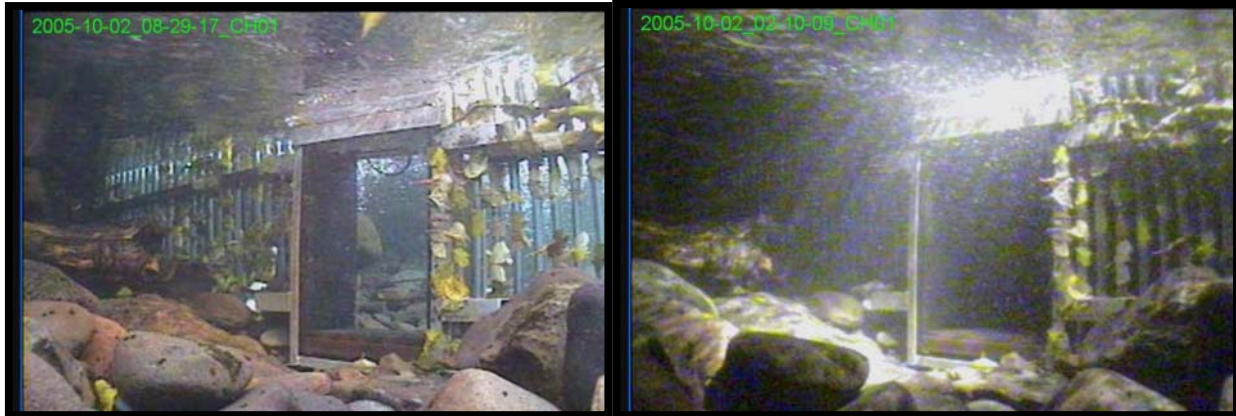


Figure 7. Lengths of sexually mature and immature bull trout captured in the screw trap.

Task 2.2 Locate spawning bull trout in the Middle Fork Willamette and tributaries to document natural reproduction of bull trout.

We operated four stream-width PIT tag antennas, counted redds, and operated a Vaki Riverwatcher fish counter in conjunction with a video recorder to determine spawning distribution of bull trout (Figure 1, Photographs 4 and 5). We believe adult bull trout spawned in the Middle Fork Willamette from Swift Creek to above Indigo Springs. We detected nine adult bull trout in the Middle Fork Willamette above Swift Creek and three above Indigo Springs. The USFS counted 20 redds in the Middle Fork Willamette from Tumblebug Creek to the Road 2143 Bridge (Table 3). However, we do not know if bull trout dug any of these redds because they did not observe bull trout, and Chinook spawn in this area during the same time period. Water temperatures in the Middle Fork Willamette ranged from 5 to 8 °C during the spawning period (Figure 8). We do not believe fish spawning in this reach entered the tributary springs because we did not detect PIT-tagged adult bull trout in Indigo Springs and we did not observe any redds in Chuckle Springs or Iko Springs (Table 3). We do not believe bull trout spawned in Swift Creek because we did not detect any PIT-tagged adult bull trout or observe adult bull trout sized fish with the Vaki Riverwatcher in Swift Creek above the Road 21 Bridge and the USFS did not count any redds in Swift Creek below the Road 21 Bridge (Table 3).



Photographs 4 and 5. Digital video recorder images of Vaki Riverwatcher fish counter at high and low light levels.

Table 3. Redd count surveys by stream, section and date.

Stream: Section	Date	New redds
Middle Fork Willamette:		
Tumblebug Creek to Indigo Springs	Sep 12	1
Iko Springs to Swift Creek	Sep 14	4
Indigo Springs to Iko Springs	Sep 15	4
Swift Creek to Echo Creek Bridge Road 2143	Sep 19	9
Tumblebug Creek to Indigo Springs	Sep 20	2
Total		20
Swift Creek:		
Side-channel	Sep 15	0
Road 21 Bridge to mouth	Sep 19	0
Total		0
Iko Springs:		
Mouth to origin	Sep 15	0
Mouth to origin	Sep 27	0
Mouth to origin	Oct 06	0
Mouth to origin	Oct 10	0
Total		0
Chuckle Springs:		
Spot check new gravel	Sep 13	0
Falls to mouth	Sep 27	0
Falls to mouth	Oct 06	0
Falls to mouth	Oct 10	0
Total		0

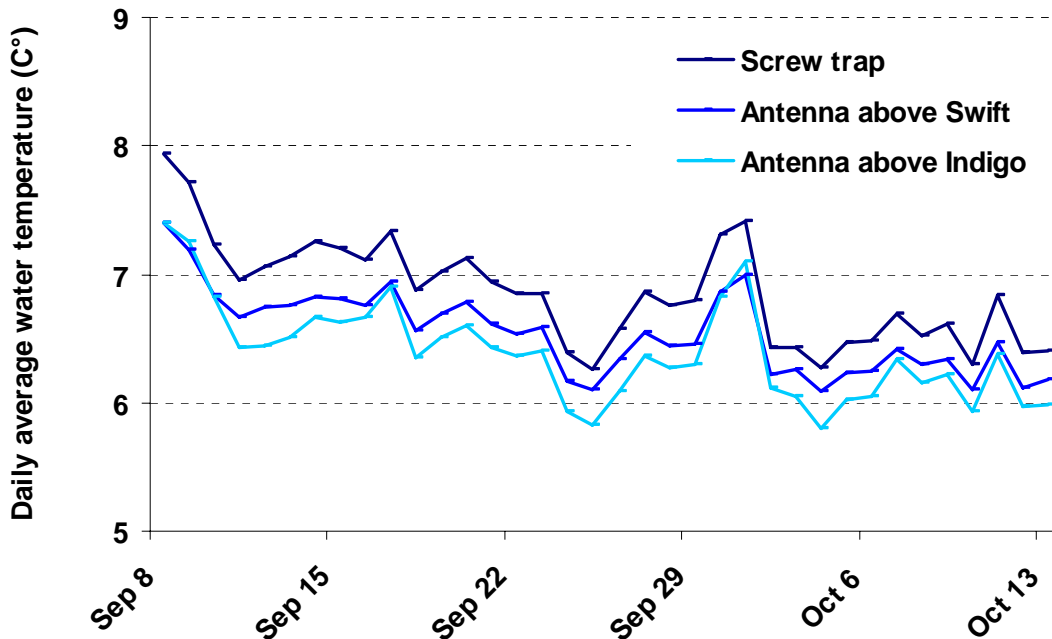


Figure 8. Daily average water temperature (C°) of the Middle Fork Willamette at the screw trap above the Rd. 2143 Bridge (RM 257), the antenna above Swift Creek (RM 258), and the antenna above Indigo Springs (RM 260).

Task 2.3. Continue snorkel counts of sub-adult and adult bull trout in the Middle Fork Willamette as an index of abundance and distribution.

With the help of USFS staff, we snorkeled pools in Middle Fork Willamette above Hills Creek Reservoir and observed bull trout 29 times between a mile above Butcherknife Bridge and a half mile below Swift Creek. USFS staff snorkeled Swift Creek from the Road 21 Bridge to its confluence with the Middle Fork Willamette twice in August and did not observe bull trout. The most bull trout we observed in any one day was six on August 11. We are not planning to repeat this activity in 2006.

**OBJECTIVE 3. Monitor the abundance of bull trout in the mainstem McKenzie population (donor population).**

The USFS/McKenzie Ranger District operated a 5-foot diameter screw trap in Anderson Creek 2 days per week from Julian week 6 through week 22. They captured 281 fry and 107 age 1 and older juvenile bull trout and estimated that 1,639 fry and 624 age 1 and older juveniles moved past the trap during the trapping period, assuming 60% trap efficiency. Peak downstream movement of fry occurred in early April (Figure 9). The annual estimated number of fry migrating is one of the lowest recorded, but the number of age 1+ and older juveniles continues to increase (Figure 10)

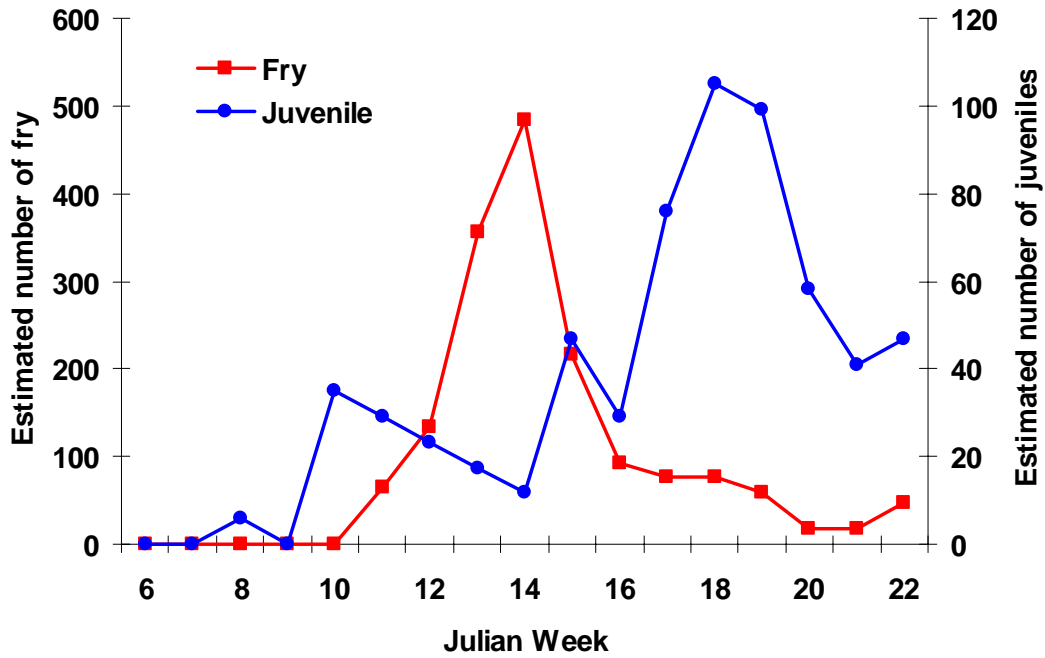


Figure 9. Estimated number and timing of fry and age 1 and older juvenile bull trout moving downstream past the screw trap in Anderson Creek below the Highway 126 culvert, Julian weeks 6-22.

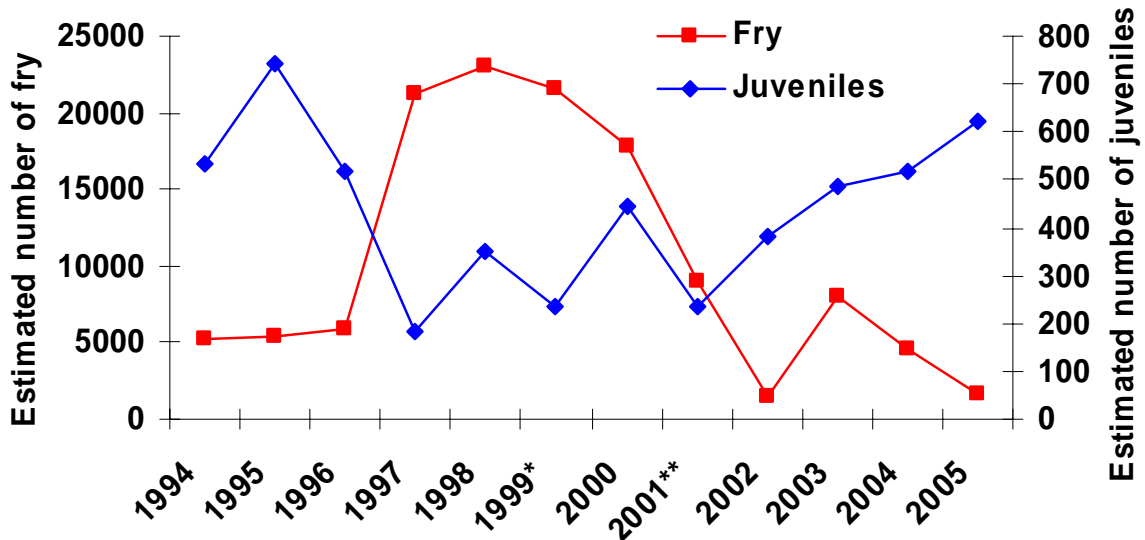


Figure 10. Estimated number of fry and age 1 and older juvenile bull trout moving downstream past a screw trap in Anderson Creek below the Highway 126 culvert from Julian weeks 8-22, 1994 through 2005. \* Missing Julian week 8. \*\* Missing Julian weeks 19-22.



We counted 47 redds, 18 live fish and four carcasses in Anderson Creek and 12 redds, three live fish, and one carcass in Olallie Creek (Table 4). The number of redds counted in Anderson Creek has declined since 2000 (Table 5).

Table 4. Number of redds counted by survey date in Anderson and Olallie creeks.

Date	Anderson Creek		Olallie Creek	
	Above Hwy 126	Below Hwy 126	Above Hwy 126	Below Hwy 126
Sep 01	0	0		
Sep 13		4	0	1
Sep 15	14			
Sep 16			4	5
Sep 29	18	2		
Oct 11			1	1
Oct 26			0	0
Oct 27	8	1		
<b>Total</b>	<b>40</b>	<b>7</b>	<b>5</b>	<b>7</b>

Table 5. Number of bull trout redds counted in the McKenzie River population, 1991-2005.

Year	Anderson Creek			Total	Olallie Creek	McKenzie below Trail Bridge Dam	Total
	Below Hwy 126	Above Hwy 126	USFS index reach				
1991	0	8	8	--	--	--	--
1992	4	9	13	--	--	--	--
1993	4	11	15	--	--	--	--
1994	7	23 <sup>a</sup>	22	30	3	--	<b>33</b>
1995	3	70	30	73	10	--	<b>83</b>
1996	1	81	26	82	7	--	<b>89</b>
1997	7	78	18	85	9	--	<b>94</b>
1998	4	75	29	79	7	--	<b>86</b>
1999	13	64	47	77	6	--	<b>83</b>
2000	15	68	44	83	9	--	<b>92</b>
2001	6	66	23	72	6	--	<b>78</b>
2002	9	51	31	60	10	--	<b>70</b>
2003	6	50	23	56	17	0	<b>73</b>
2004	6	43	24	49	12	1	<b>62</b>
2005	7	40	24	47	12	2	<b>61</b>

■ Count did not cover the entire area of bull trout spawning in this stream.

<sup>a</sup> Count covered entire area one time.

**OBJECTIVE 4. Implement the Rehabilitation Plan for the bull trout population in the Middle Fork Willamette River (USDA and ODFW 1997).**

The Rehabilitation Plan calls for transferring a maximum of 2,000 fry or 25% of the fry potentially captured in the Anderson Creek screw trap to the Middle Fork Willamette Basin (see **APPENDIX B**). The proportion of the fry transferred is actually less than 25% of the fry in Anderson Creek because many fry rear above the trap, the trap captures about 60% of the fry moving downstream, fry move downstream outside of the trapping period, and bull trout spawn below the screw trap. We transferred 142 fry from Anderson Creek to Indigo and Iko springs in 2005 (Table 6). We estimate this was 9% of the fry moving downstream past the trap. 2005 was the ninth consecutive year of fry transfers under the Bull Trout Rehabilitation Plan and brings the total number of fry transferred to over 10,000 (Table 7).

Table 6. Number, date and location of bull trout fry released in the Middle Fork Willamette Basin above Hills Creek Reservoir, 2005.

Release Site	Date	Number of fry
Indigo	March 30	61
Iko	April 7	81

Table 7. Number of fry transferred from Anderson Creek to the Middle Fork Willamette Basin above Hills Creek Reservoir, 1997-2005.

Year	Chuckle	Indigo	Iko	Shadow	Skunk	Found	Swift		Bear	Echo	Total
							Below Rd 21	Above Rd 21			
1997	96	26				56					178
1998	411		938	150							1,499
1999	302		1,000	148			526				1,976
2000	349	204	1,075	53		285	300	522			2,788
2001	269		418					96	673		1,456
2002	177		75						38		290
2003	365	242	439						388	28	1,462
2004	149	109	129					155	75		617
2005		61	81								142
Total	2,118	642	4,155		56	285	826	773	1,174	28	10,408

**OBJECTIVE 5. Determine the effectiveness of the adipose fin-clipped only harvest regulation for trout in Hills Creek Reservoir and the Middle Fork Willamette River for protecting bull trout.**

Task 5.1. Sample Hills Creek Reservoir with trap nets to estimate the ratio of fin-marked hatchery trout to unmarked trout and salmon.

We set a sinking trap net near the head of Hills Creek Reservoir for nine nights from mid April through mid May and captured many species of fish, but no bull trout (Table 8). Sixty-seven percent of the legal-sized rainbow trout ( $\geq 8$  inches) caught were adipose fin-clipped.

Table 8. Fish caught in a sinking trap net set in Hill Creek Reservoir for 9 nights between mid April and mid May 2005.

Date	Rainbow > 8 in.		Rainbow < 8 in.	Chinook	Largemouth bass	Yellow bullhead	Crappie	Bluegill	Sucker	Redside shiner	Dace
	Adipose fin-clipped	Not fin-clipped									
Apr 12	0	4	0	0	0	10	0	0	45	2	0
Apr 14	1	2	0	1	0	1	0	0	18	0	0
May 3	18	1	2	1	1	47	98	2	890	9	0
May 4	2	1	0	6	0	25	105	2	46	2	0
May 5	10	1	0	0	0	40	51	7	760	1	0
May 10	6	5	5	0	0	4	0	1	95	4	1
May 11	9	5	5	1	0	3	1	0	76	0	0
May 12	0	4	1	0	0	3	0	6	17	0	0
Total	46	23	13	9	1	133	255	18	1,947	18	1

Task 5.2. Obtain data from Oregon State Police (OSP) about angler compliance with the fin-marked trout only harvest regulation.

OSP contacted 117 anglers during 30.5 hours of patrolling Hills Creek Reservoir. They issued three citations for unlawful take of non-fin clipped trout, none related to bull trout.

Task 5.3. Place informational signs distribute pamphlets and speak with anglers to increase awareness of regulations protecting bull trout in the Middle Fork Willamette and Hills Creek Reservoir.

We replaced informational posters and distributed pamphlets to increase awareness of regulations protecting bull trout in the Middle Fork Willamette and Hills Creek Reservoir.

**OBJECTIVE 6. Provide information acquired about bull trout to the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and other regional entities.**

The Upper Willamette River Bull Trout Working Group met on December 14, 2005 to coordinate field activities and exchange information.

**ACKNOWLEDGMENTS**

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## APPENDIX A

Appendix Table A. Tagging and detection history for juvenile bull trout detected at a stream-width PIT tag antenna in the Middle Fork Willamette River above Swift Creek.

Tagging		Detection		
Location: Date	Fork length (mm)	First	Last	Days
Chuckle				
03/22/05	107	06/23/05	07/11/05	111
Iko				
06/17/04	129	04/23/05		310
06/17/04	110	03/26/05		282
06/17/04	126	04/26/05		313
04/05/05	109	04/17/05		12
04/05/05	136	04/30/05		25
06/15/05	102	07/29/05		44
Indigo				
06/17/04	125	03/27/05	05/19/05	336
06/23/04	114	04/23/05		304
06/23/04	102	06/26/05		368
03/15/05	143	04/19/05		35
04/21/05	164	05/05/05		14
06/23/05	128	09/09/05		78

## APPENDIX B

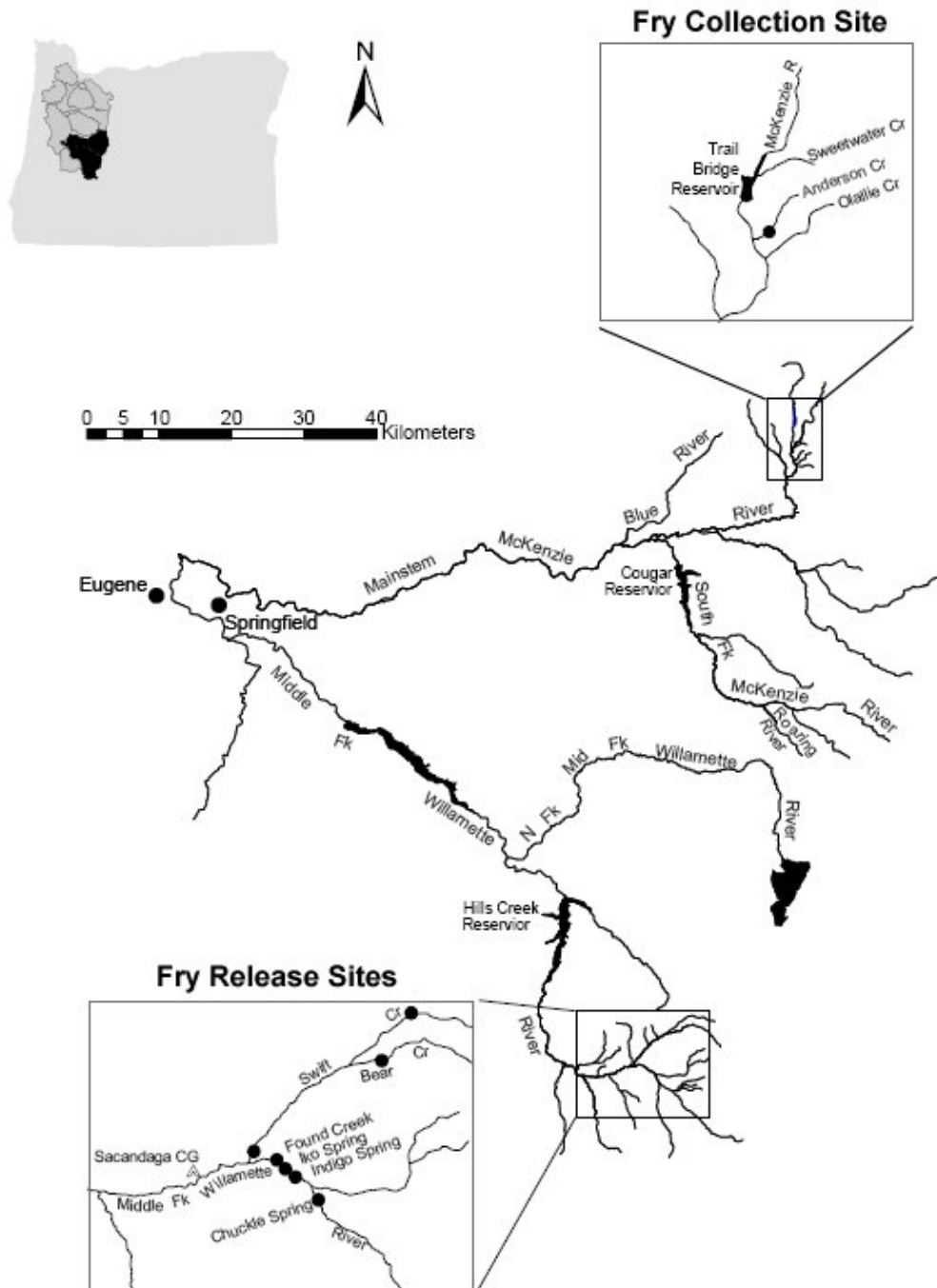


Figure 1. Location of bull trout fry collection in the McKenzie Basin and release sites in the Middle Fork Willamette River.