

# Rainbow Trout Radio- Tracking Survey 2004 – Final Report



*Prepared for*

**Fisheries Work Group \***  
**Spokane River Project Relicensing**

*Under Contract to*

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\* When approved by the Work Group, the Coeur d'Alene Tribe specifically withheld their approval of this report.

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## ACRONYMS

ALP	Alternative Licensing Procedures
Avista	Avista Corporation
cfs	Cubic feet per second
FERC	Federal Energy Regulatory Commission
FWG	Fisheries Work Group
GPS	Global Positioning System
HEDs	Hydroelectric developments
PM&Es	Protection, mitigation and enhancement measures
RM	River mile
WDFW	Washington Department of Fish and Wildlife

## SUMMARY

The Spokane River Hydroelectric Project (Spokane River Project, or Project) is owned and operated by Avista Corporation (Avista), pursuant to a license issued by the Federal Energy Regulatory Commission (FERC). The Project includes five distinct hydroelectric developments (HEDs) located along the Spokane River in northern Idaho and eastern Washington: Post Falls (located in Idaho), and Upper Falls, Monroe Street, Nine Mile, and Long Lake HEDs all located in Washington. This report provides results of a rainbow trout (*Oncorhynchus mykiss*) radio tracking evaluation conducted under the direction of the Fisheries Work Group (FWG) to gather information concerning Project relicensing issues (i.e., related to seeking a new FERC license).

This report provides information on the behavior of rainbow trout in the Spokane River downstream from the Post Falls HED as determined by radio tracking adult fish. The Fisheries Work Group desired additional information on the distribution and extent of rainbow trout spawning, and post-spawning movements and distribution to support developing appropriate protection, mitigation and enhancement measures (PM&Es) for the FERC relicensing process.

In the Project area, river flows and corresponding fish habitat can be influenced at times by operation of the Post Falls HED. River flows influenced by the Post Falls HED, primarily during the late spring, may affect both fish production and distribution in the Spokane River. At other times of the year, Post Falls HED either does not have the ability to substantially influence river flows, or is operated as a run-of-river facility (outflow equals inflows to Coeur d'Alene Lake).

Riverine fish habitat occurs in two substantial lengths of free-flowing river downstream from the Post Falls HED, one between Post Falls HED and the head of the Upriver Dam reservoir at RM 83.8 (a City of Spokane project), and a second extending between Monroe Street HED and the Nine Mile HED Reservoir (RM 74-63). In this report, these two free-flowing areas are referred to as the upper river and lower river study reaches, respectively.

This investigation of rainbow trout behavior was conducted to identify movements, distribution, timing of natural spawning, and post-spawning behavior. Previous studies indicate that rainbow trout typically spawn, eggs incubate, and fry emerge between late-March and early-June in the Upper Spokane River (Parametrix 2003; Avista 2000a; Johnson 1997). This timing potentially overlaps with the time period that Post Falls HED is operated to control river flows in the downstream free-flowing reaches. At the end of this period and during run-of-the-river operation, flow level fluctuations and high summer water temperatures have the potential to affect the spawning success and distribution of rainbow trout in the free-flowing reaches of the Spokane River.

Rainbow trout behavior was studied by tracking radio-tagged adult rainbow trout in these two free-flowing reaches of the Spokane River over an 18-month period. The results of a closely-related rainbow trout spawning survey and fry emergence evaluation in 2003 are provided in a separate report (Parametrix 2003). Additional surveys of tagged fish conducted in July 2004 are included in Appendix D.

### ***March Releases— Upper River Reach***

Thirty-one rainbow trout were radio-tagged in the upper river reach during the first half of March 2003. These radio tags had an operating life of approximately 580 days, sufficient to last at least through the 2004 spawning period providing data before, during and after at least one spawning season. Mobile tracking surveys conducted during the spawning period identified areas occupied by tagged fish to indicate possible spawning areas.

Fifteen tracking surveys were conducted between April 3 and October 27, 2003. In 2003, tracking was conducted approximately once a week in April (peak spawning period), about twice a month from May to September, and once in October. The initial tracking in 2004 occurred on January 17, followed by weekly surveys from the second week in March through the third week in April, and bi-monthly surveys in June and July.

Tag locations showed that half the tagged fish moved to known or suspected spawning areas. Sixteen of the 31 upper reach fish were located in areas where trout redds were observed in 2003 (Parametrix 2003). The other 15 fish were located in areas where no signs of spawning activity, or detectable emergent fry were observed. However, subsequent observations during low-flow conditions showed the presence of some potential spawning habitat in the areas where ten of these fish were located during the spawning period. In particular, dispersed pockets of gravel substrate were observed within the typical large cobble/boulder substrate within about a 1-mile reach upstream from Mirabeau Point. Five radio-tagged fish were detected in this reach during the 2003 spawning season, and two fish during the 2004 spawning season.

Eleven (35%) of the 31 fish tagged in the upper study reach moved more than 0.5 miles downstream from their release location prior to or during the 2003 spawning period. Other fish tagged in the upper river reach tended to remain within close proximity of the release location during the spawning period, occasionally moving up and downstream within a small range.

Following spawning, no consistent movement patterns were observed. Twelve fish (39%) exhibited no substantial movement. Nine fish (29%) moved upstream at least a short distance, with two eventually moving back downstream. The other fish generally moved downstream, including two that were later detected, apparently dead, downstream from Monroe Street HED.

Six fish (19%) appeared to seek thermal refuge as water temperatures increased during the summer, by moving downstream to or past the Sullivan Road area. The aquifer springs downstream of Sullivan Road have been shown to reduce water temperatures by several degrees or more, providing thermal refuge during the summer months. Temperatures at the Post Falls HED tailrace exceeded 17° C by June 7, and reached 25° C or higher in August. However, downstream from Sullivan Road we recorded water temperatures between 10° and 14° C in July and August. No active trout were detected in the reach from the Idaho/Washington state line to the Sullivan Road area during the summer of 2003. In addition, the only March-released fish determined to be active during the 2004 spawning season were downstream of Sullivan Road, in the Mirabeau Point pool during the summer, early fall, and late winter periods.

Tagged fish typically occupied nearshore areas downstream of flow obstructions, which was similar to the areas where they were captured. This consistent habitat use is likely due to the relatively uniform channel configuration (steep-sloped banks and frequent run/glide habitat), and substrate composition (predominantly boulder and cobble) found through much of the upper river study reach.

Following spawning, many tagged fish either died, or were lost to recreational fishing or predation. Over half of the tagged fish were undetected in the upper river reach at some point after the spawning period. Six tags (19%) were recovered from the streambed or the riverbanks by September, and two fish passed downstream to the lower river study reach. Two additional tags were recovered by June 2004. Of these recovered tags, four were found in the river (in shallow water), three up on the riverbank, and one at the base of a utility pole upstream from Harvard Road. While at least three of the recovered tags appeared to be the result of predation and fishing mortality, in the other cases it was not clear whether the recovered tags were the result of tag expulsion, predation, or mortality.

Ten other tags (32%) have been undetected since at least September 2003. While the fate of these fish is uncertain, some were likely removed from the river by anglers or predators. All but two of the detected tags have been relatively stationary since at least October 2003, indicating they are not in living fish. Snorkeling attempts to observe the tagged fish or recovery the stationary tags were typically unsuccessful due to the size of the river and the large substrate material. The two tags that still appeared to be in active fish in July 2004 were detected in the Mirabeau Point area (RM 86.3) during the summer, fall and winter seasons. During the 2004 spawning season, both of these fish were detected just upstream of the Mirabeau Point pool, before moving back to this pool by June.

### ***March Releases — Lower River Reach***

Twenty-nine trout were tagged in March 2003 in the lower river reach. Twenty tracking surveys were conducted between mid-March and late October in this reach. In addition to mobile surveys, two fixed monitoring stations were deployed in the lower river reach. One station was deployed at Nine Mile HED (RM 58) to detect tagged fish occupying the area near the dam and potentially passing downstream out of the study area. The other station was deployed at the USGS gauging station located in Latah (Hangman) Creek, about 0.8 miles upstream from its confluence with the Spokane River (RM 72.2), to detect tagged fish moving into the creek.

Most tagged fish appeared to move to observed spawning areas during the 2003 spawning period. However, 12 (41%) of the tags were detected in areas where no observed spawning fish, redds, or newly emergent trout fry were observed in 2003 (Parametrix 2003). Later observations of these areas, during low flows, showed no evidence of spawning activity or newly emergent fry even though small pockets of suitable substrate were present in a number of these areas.

Twenty-seven (93%) of the 29 tags released in the lower river study reach were detected during the 2003 spawning period (April), with at least 20 detected through mid-September. Seventeen (58%) of the fish moved more than 0.5 miles upstream or downstream from their release locations prior to or during the 2003 spawning period. Fish released in the upstream portion of the reach tended to move downstream and those released in the downstream portions generally moved upstream.

Only one tag was detected on the fixed monitoring receivers, through the 2003 and 2004 monitoring periods. This tag was detected for several days in late April (2003) in the Nine Mile HED reservoir, but was not detected again after that time. None of the tags were detected at the fixed monitoring station in Latah Creek, though a single fish was detected in the creek downstream from the fixed station during the April 4, 2003 tracking survey. Therefore, Latah Creek does not appear to be an important spawning area for the lower river reach rainbow trout population. Although some spawning may occur in the lower reach of the creek, surveys of this area found no gravel substrate deposits suitable for spawning.

Most (66%) of the lower river reach fish either died or expelled their tags by the end of the 2004 spawning season. Of these 19 fish, only three tags were recovered and a fourth tag was located on shore but not recovered. At least six tagged fish were active through the 2004 spawning season, although their movements were generally limited. Three of these fish appeared to spawn in the same general areas in both 2003 and 2004, while the other three occupied areas at least 1 mile apart during the two spawning periods.

Four other fish showed little or no upstream or downstream movement through the 2004 monitoring period, but did appear to move laterally in the stream and/or occupy areas with suitable spawning habitat during the spawning period.



In the lower river reach, fish tended to occupy nearshore habitat similar to the upper river reach fish during the spring. They also tended to occur in shallow riffle/run habitat during the summer. This distribution might be influenced by the extensive riffle habitat and gradually sloped shorelines present in many areas of the lower river reach.

### ***November Releases— Upper River Reach***

Fourteen additional trout were tagged in the Idaho portion of the upper river reach in November of 2003. All but one fish was detected during the 2004-spawning season, with the other fish not detected until June downstream from Sullivan Road (RM 87.5). Nine fish (64%) moved more than 1 mile downstream from their respective release locations and two (14%) moved upstream, while three (21%) showed little or no movement. Only one fish, that moved at least 1 mile after release, returned to near the release location by July.

Eight (57%) of the fish released in the Idaho reach were detected in Washington during the 2004 spawning season. Two others were also detected in Washington in April, but only on one occasion each. Of these ten radio-tagged fish detected in Washington in April, seven were detected in known spawning areas. As of July 29, seven (50%) of the fish had moved back into the Idaho reach, and five (36%) moved downstream of Sullivan Road. One of these downstream moving fish passed downstream of Upriver Dam, and the other moved to the Upriver Dam pool. However, neither of these fish were active by July 29.

Two November-released tags were recovered on June 25, 2004. One was located about 0.6 miles downstream of the release location by January, and the other was found about 12 miles downstream. No movements of these fish were observed after January, thus it is likely that these fish died or expelled their tags prior to the 2004 spawning season. Four additional tags were recovered in July, two in the Idaho reach and two in Washington. Three of these fish moved to known or suspected spawning areas in Washington, although one exhibited no movements after first being detected at the Island Complex spawning area in January. The fourth recovered tag was in a fish that appeared to spawn just downstream of Post Falls HED.

### ***November Releases — Lower River Study Reach***

All 13 of the lower river fish released in November were detected in 2004. Nine fish (69%) moved at least 1 mile prior to, or during the 2004 spawning season. These included six fish moving downstream, and three moving upstream from their release locations. The other four fish exhibited little or no movement after release. Eight of the tags (62%) were also determined to be in active fish during the spawning season, while two (15%) exhibited no obvious movements after January. While several of the active fish exhibited little or no upstream or downstream movement in 2004, they appeared to move laterally within relatively small areas, and occupied known or potential spawning habitat during the spawning season. A total of eight fish (62%) were located in known spawning areas in 2004.

### ***Conclusions***

Most (65%) of the fish tagged in the Idaho portion of the Spokane River, apparently spawned in Washington. This is likely due to the amount of spawning habitat available in Washington within a few miles of the Idaho border (Johnson 1997, Avista 2000a, Parametrix 2003).

Our observations indicate the fish in the upper river study reach tend to move short distances (18 of 31, 58% moved less than 0.5 mile) prior to the spawning period. However, 15 of the detected fish (60%) moved more than 0.5 miles after the spawning period. This suggests that rainbow trout in the upper river reach may have begun to move toward the spawning areas prior to tagging in March. The more than three-fold increase in the electrofishing capture rate in the Idaho portion of the study reach in November,

compared to March, also suggests that the fish were already staging near the spawning areas prior to the March. In the lower river reach, half of the fish moved less than 0.5 miles soon after the March release and only a third moved more than 0.5 mile after the spawning period. The differences between migration distances in the upper and lower reaches might be due to fish from a wide area in the upper river reach moving to a few large concentrated spawning areas, while fish in the lower river reach tend to spawn in relatively small isolated areas of spawning habitat.

About half of the radio-tagged fish were located in known spawning areas during the spawning periods in both the upper and lower river reaches. Fish were also detected in a number of areas where no redds were observed. This may indicate that some fish are either not spawning or are using small gravel patches that are difficult to detect during high spring flows. This includes the 1-mile reach upstream of Mirabeau Point pool, where five radio-tagged fish were detected during the 2003 spawning season, and two fish during the 2004 spawning season.

In the lower river reach we typically observed spawning in relatively shallow areas downstream of inundated vegetation. The vegetation provides flow refuge similar to large instream objects. Our results suggest that spawning may occur in more areas of the Spokane River than previously estimated.

Our data indicate Spokane River rainbow trout are not likely to move into Latah Creek. No fish were recorded at the fixed monitoring station and only a single fish was detected within the mouth of the stream.

The upper river reach tracking data indicate that only a few of the fish migrated downstream to the Barker Road area for thermal refuge following spawning. However, fish tagged in this reach tended to remain there with large concentrations of untagged fish observed in the pools during the summer.

Bennett and Underwood (1988) found that radio-tagged fish were typically located along the river margins, out of the main current, during the high spring run-off period. While we observed similar behavior of the radio-tagged fish in the spring, the fish tended to occupy shallow riffle habitat away from shore in the summer, particularly in the lower river study reach. This behavior is more consistent with snorkel surveys conducted in the summer by Bailey and Saltes (1982) in the upper river reach.

We observed substantially lower survival rates in this study (as low as 6%) as compared to the approximate 30% survival reported by Bennett and Underwood (1988) for Spokane River trout. However, their estimates were based on tag recapture data from multiple age-classes, and their fish were not exposed to the stress of surgical tag implantation. Henderson et al. (2000) reported 22% mortality within 10 weeks of implanting radio tags in trout, and Bunnell and Isely (1999) reported tagging-related mortality rates of between 7 and 25%. The additional effects of spawning, relatively soon after tagging, might also have contributed to an overall high mortality rate. Hockersmith et al. (1995) reported a 6% post-spawning mortality rate of radio-tagged rainbow trout, although their fish were tagged in February and ours were tagged in March.

Our data indicate predation and angling may be a continuing source of rainbow trout mortality in the Spokane River. We recovered at least four tags on shore, which were likely the result of predation. One was recovered at the base of an osprey perch tree, and another at the base of a telephone pole. In addition, we tracked a tag to an apparent otter den, and recovered another with a gnawed antenna adjacent to the remains of a fish skeleton. Bailey and Saltes (1982) report that the greatest fishing pressure in 1980 and 1981 in the upper Spokane River was in the area downstream of Barker Road. Fifty percent of the tags that were undetected in the upper river study reach during our late spring and summer surveys were last detected downstream from Barker Road. Although the Washington portion of the upper river study reach is restricted to a catch and release fishery and artificial bait, we often observed anglers violating these regulations. It is possible that many of undetected radio-tagged fish were the result of such violations.

# 1. INTRODUCTION

This report provides results and discussion of a rainbow trout (*Oncorhynchus mykiss*) radio-telemetry tracking study conducted in the Spokane River between March 2003 and June 2004. Information is provided on the movement patterns and habitat use of 87 rainbow trout tagged and tracked within two free-flowing reaches of the Spokane River, in Washington and Idaho.

## 1.1 GENERAL PROJECT AND RELICENSING PROCESS INFORMATION

The Spokane River Hydroelectric Project (Spokane River Project, or Project) is owned and operated by Avista Corporation (Avista) and operates under a license issued by the Federal Energy Regulatory Commission (FERC) as Project No. 2545. The Project includes five distinct hydroelectric developments (HEDs) located along the Spokane River in northern Idaho and eastern Washington (Figure 1). The most upstream of the five developments is the Post Falls HED (River Mile [RM] 102) located in Idaho approximately nine miles downstream of Coeur d'Alene Lake, where the Spokane River begins. The remaining four developments, from upstream to downstream, are: Upper Falls HED (RM 74.2), Monroe Street HED (RM 74), Nine Mile HED (RM 58), and Long Lake HED (RM 34), are all located in Washington. Another hydroelectric project, owned by the City of Spokane (Upriver Dam) is located between the Post Falls and Upper Falls HEDs, at about RM 80.2.

The current FERC license for the Spokane River Project expires on July 31, 2007. To obtain a new FERC license for continued operation of the Project, Avista must file an application with FERC by July 31, 2005. In seeking to relicense the Project, Avista and the other stakeholders are using the FERC Alternative Licensing Procedures (ALP), which are intended to streamline the relicensing process through a more collaborative approach between the utility and various stakeholders. As part of the ALP relicensing process, Avista, in close consultation with state and federal resource agencies, Indian Tribes, and other interested parties, is identifying information needs and conducting appropriate studies to evaluate the potential influence of Project operations on natural resources in the Project area. The rainbow trout radio tracking assessment reported here is one such study. The study plan was developed and the investigation was conducted under the direction of the Fisheries Working Group (FWG) for the Spokane River Project relicensing.

## 1.2 STUDY SPECIFIC BACKGROUND INFORMATION

During certain times of the year, the Post Falls HED is used to directly influence Spokane River flows and the associated water level elevations in Coeur d'Alene Lake. At other times of the year, Post Falls HED either does not have the ability to substantially influence river flows, or is operated as a run-of-river facility (i.e., outflow from the facility is equal to the inflow).

From January through the spring runoff period, Spokane River flows are typically controlled by the natural restriction of the river channel upstream of Post Falls HED, rather than by Project operations. As the spring flows decrease, Post Falls HED is operated to balance upstream and downstream interests including protection of rainbow trout spawning habitat and achieving the desired summer water level in Coeur d'Alene Lake. The lake level is maintained at a summer elevation of 2,128 ft through Labor Day and subsequently drawn down during the fall and early winter months. At some point during the winter the lake reaches natural water levels as determined by inflow and the outlet channel restriction, and Post Falls HED is once again operated as a run-of-river facility into the spring runoff period exerting little or no control over upstream water levels or downstream flows.

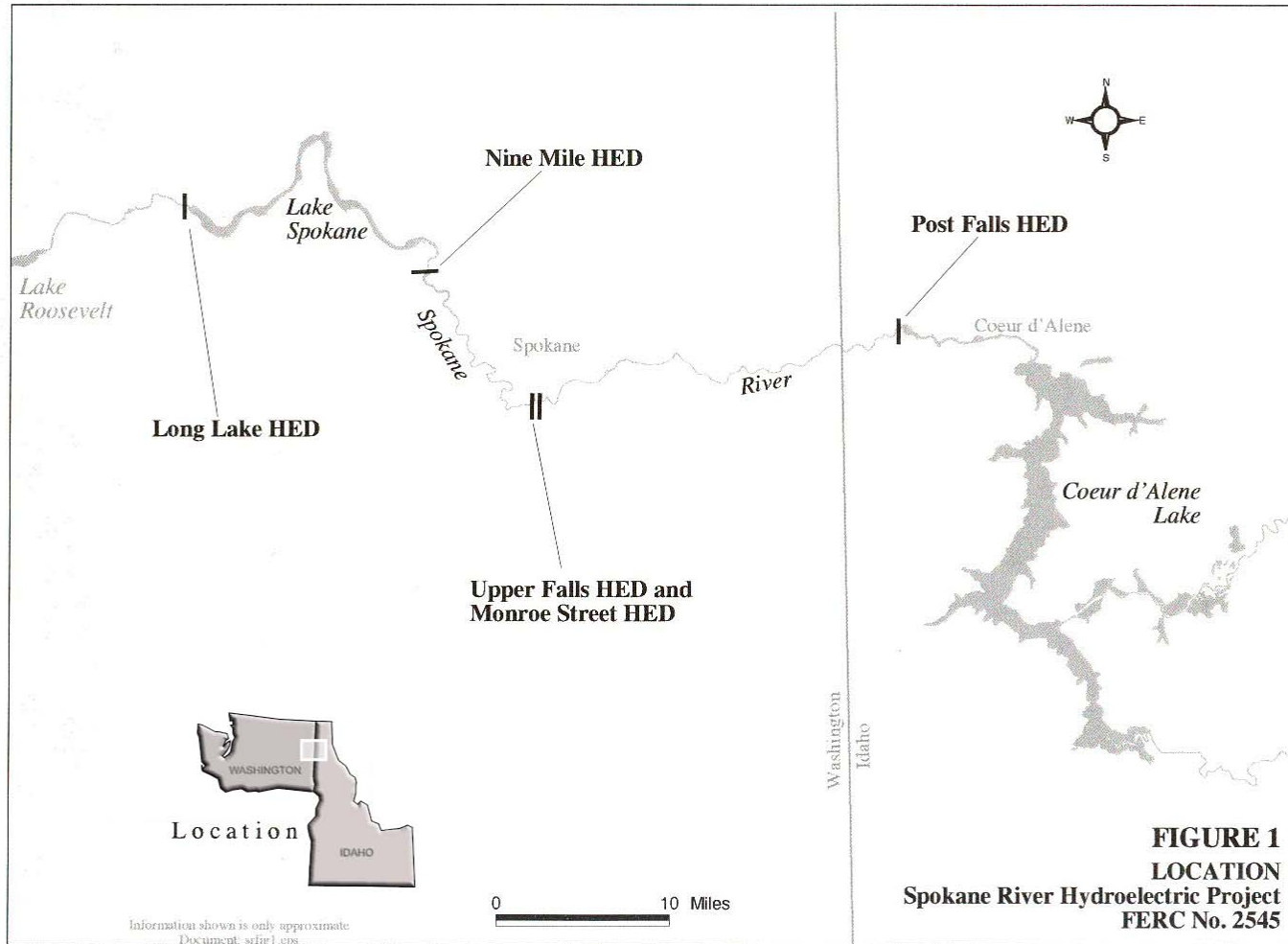
Following the spring run-off, a combination of factors including natural geologic features, weather, water use, and operation of Post Falls HED influence flow conditions downstream of Post Falls HED. In addition to affecting outlet flow volumes, the natural restriction in the river channel upstream of Post Falls HED allows only surface water from the upper 20 feet of the lake to enter the river channel (Golder and HDR 2004), which is then discharged through the Post Falls HED. Warm summer weather conditions results in warming of the surface layer of the lake, lake stratification, and summer river temperatures at Post Falls that typically exceed 20° C.

Water temperatures and flows in the river are also influenced by groundwater interactions. Studies have established a direct hydraulic connection between the Spokane River and the Spokane-Rathdrum Valley Aquifer (Golder 2001). The river generally loses water to the aquifer upstream of Barker Road in Washington, but gains water from the aquifer further downstream. This groundwater discharge results in decreasing summer water temperatures downstream of Sullivan Road.

Previous studies indicate that rainbow trout in the 18-mile free flowing reach of the river downstream of Post Falls HED typically spawn in late-March and early-April (Parametrix 2003, Avista 2000a, Johnson 1997). This timing potentially overlaps with the time period that the Post Falls HED has the ability to control river flows. Studies have suggested that river flow is a key factor in rainbow trout fry recruitment (Bailey and Saltes 1982, Bennett and Underwood 1988, IDFG et al. 1990). Bennett and Underwood (1988) also suggested that variable and sometimes poor fry recruitment in the Idaho portion of the Upper Spokane River was an important element in the observed declines in the number of rainbow trout in the late 1980s and early 1990s.

Bennett and Underwood (1988) estimated high annual mortality rates for rainbow trout of about 70% in the Idaho portion of the Spokane River. They suggested that natural mortality was a major contributor to this overall mortality rate and identified several possible causes of the relatively high natural mortality including, post-spawning mortality, flow fluctuations, high summer water temperatures, low summer flow, heavy metal toxicity, and over-winter mortality. However, little is known about how these factors actually influence rainbow trout and their habitat in the free-flowing reaches of the Spokane River.

The FWG reviewed the available information and agreed that rainbow trout is the primary fish species of interest in the free-flowing reaches of the Spokane River. They also determined that additional information concerning the distribution, seasonal movements and habitat use of rainbow trout in the Spokane River was desired to support development of appropriate protection, mitigation and enhancement measures (PM&Es) for the FERC relicensing process. In particular, the FWG identified that there was limited information concerning the seasonal distribution, movements, habitat use, and spawning activity in the free-flowing river reaches downstream of the Monroe Street HED. This interest in additional information and data concerning rainbow trout in the Spokane River eventually lead to the development and FWG approval of a study plan to assess the habitat use, spawning distribution and movements of rainbow trout in the Spokane River (Avista 2003). This report provides the results of the radio-telemetry tracking portion of that overall assessment. Additional information on rainbow trout spawning and fry emergence in 2003 in the free-flowing reaches is provided in a separate study report (Parametrix 2003).



## 2. GOAL AND OBJECTIVES

The goal of this study was to collect information concerning rainbow trout spawning, post-spawning, and summer distribution and habitat use in the free-flowing reaches of the Spokane River, by tracking the movements of radio-tagged adult rainbow trout throughout the spring and summer months of the 2003 and the 2004 spawning periods. The primary study objectives were to:

- identify and map the movements and habitat utilization of rainbow trout in the Spokane River by tagging 80 fish with radio transmitters and tracking their movements periodically between spring 2003 and summer 2004,
- determine habitat characteristics of locations where trout were found to be holding, and
- identify potential spawning areas not previously identified.

### 3. METHODS

Rainbow trout spawning in the Upper Spokane River typically begins in late-March or early-April (Parametrix 2003, Johnson 1997, Avista 2000a). To assess movements related to pre- and post-spawning activity and summer rearing behavior, rainbow trout were captured and radio tagged during the second week of March and the third week of November 2003. Digitally encoded radio transmitters (model MCFT-3FM, Lotek Engineering, Newmarket, Ontario, Canada) were used in the study. The tags operated on the 150-151 kHz frequency band, transmitting a signal every 5 seconds. Each cylindrical transmitter measured 11 mm in diameter, 59 mm in length, weighed 4.6 g in water, and had a 300 mm whip antenna. The radio tags have an operating life of approximately 580 days, sufficient to last at least through the 2004 spawning period and provide data on the distribution of rainbow trout in the upper Spokane River before, during and after two spawning seasons.

Rainbow trout were collected from the Spokane River with a Smith Root (Model 7.5 GPP) electrofisher, mounted on a 16 ft cataraft. The electrofisher was operated in pulsed DC mode at 500-1000V. For each tagging event the raft was launched in a given river reach and navigated downstream, primarily shocking along the shoreline. We typically selected the shoreline with the most potential for providing holding habitat for adult fish (i.e., areas with large boulders, bridge abutments, large woody debris, undercut banks, etc.) However, on successive electroshocking efforts in a given reach we attempted to shock on the opposite shoreline, to the extent practical for a cataraft. Knot-less cotton mesh dip-nets were used to gather the stunned fish. Although a number of different species were stunned, we attempted to only capture rainbow trout greater than about 300 mm in length. The captured fish were placed in a dark-colored plastic holding tank of fresh water, equipped with a lid, to keep the fish calm and to minimize holding stress.

Once one or more rainbow trout were collected, the raft was rowed to the nearest eddy to surgically implant the radio tags. The trout were examined to verify that they were of suitable size and condition for tagging. Fish smaller than 300 mm were not tagged unless the tag-to-fish weight ratio exceeded about 2%, which is the general rule of thumb for telemetry studies (Winter 1983). Fish larger than about 410 mm were also not tagged because they have a higher likelihood of being caught and retained in the recreational fishery, or die of natural causes. Some fish, that were either too small to tag or in poor condition, were retained for an independent Washington Department of Fish and Wildlife (WDFW) fish disease evaluation. We also collected non-lethal fish tissue samples for another WDFW evaluation to assess the genetic composition of rainbow trout in the Spokane River. These genetic samples consisted of clipping off a small piece of the caudal fin and placing the tissue in a vial of alcohol.

A fish selected for radio tagging was placed in a second dark-colored holding tank containing approximately 80 mg/L concentration of tricaine methanesulfonate (MS-222). Once the fish were anesthetized, the length, weight, and sex determinations were recorded on field data sheets. Anesthetized fish were transferred to a surgical platform equipped with a V-shaped trough to hold the fish upright with the ventral side exposed. A gravity-fed irrigation system was used to flush the gills with the anesthetic solution during the tagging procedure.

The tags were surgically implanted in the body cavity using methods described in Summerfelt and Smith (1990). Tags were inserted into the fish through an incision made just to the side of the mid-ventral line and anterior to the pelvic girdle. Prior to making the incision the area was swabbed with a betadine antiseptic solution, and rinsed with a saline solution. A cannula was used to insert the antenna through the body cavity musculature posterior to the incision point (near the pelvic girdle) and allowed to trail posteriorly.

The incision was then sutured closed and glued with a veterinary tissue glue to help seal the incision and to hold the suture knots. After the surgical procedure, which typically lasted about 10 minutes, the fish was transferred to a recovery tank of freshwater. When the fish was able to maintain an upright position (taking from 10-15 min.) it was released back into the river at the tagging location. The release location was noted on an aerial photo and through GPS coordinates.

The subsequent locations of radio tagged fish were determined through tracking efforts conducted about once every 7 days during the spawning period in the upper river study reach, and about twice every 7 days in the lower study reach. After the 2003 spawning period (late April-September), fish were tracked about twice a month. A tracking survey was also conducted in October 2003 and January 2004, followed by twice a month tracking in March 2004 and weekly tracking during the April 2004 spawning season. Bi-monthly surveys were also conducted in the upper study reach in June and July of 2004.

Tracking was conducted primarily by inflatable raft or cataraft during the spawning period, and when flows were sufficient to float the entire study reaches. During low-flow conditions, tracking was conducted in the upper river study reach by canoe or from a vehicle driven along the Centennial Trail. In the lower river study reach, tracking during low-flow conditions was conducted from adjacent roadways. When a signal was detected from the roadway, we typically walked down to the river to determine where the fish was located. The time, approximate river mile, estimated fish location and habitat type (if identifiable) were recorded on data sheets. The locations were also recorded on maps or aerial photographs. The location of tagged fish during the spawning period was used to identify potential spawning areas to further investigate during subsequent spawning surveys (Parametrix 2003).

Mobile tracking was conducted using an ATS Model 2000 radio telemetry receiver, with a Cushcraft P150-4 four-element Yagi antenna or an omni-directional whip antenna. In-river tracking procedures typically consisted of floating down the center of the channel, with the Yagi antenna pointed forward until a signal was detected. After detecting a signal, the tracker rotated the antenna from side to side to determine which side of the river the tag was located in relation to the raft. The tag location was determined by the direction of the strongest signal, typically verified as the boat was even with, or slightly downstream of the tag location. Shoreline tracking was conducted in a similar manner, although the lateral (left or right bank) position of the tag was typically determined by the location of the strongest signal when monitored perpendicular to the river, as well as the angular direction of the strongest signal when further upstream or downstream from that location. Thus, tag locations were typically classified according to the general habitat features in the area occupied by the fish (pool, riffle, etc.), rather than a highly site specific characterization based on actual fish observation.

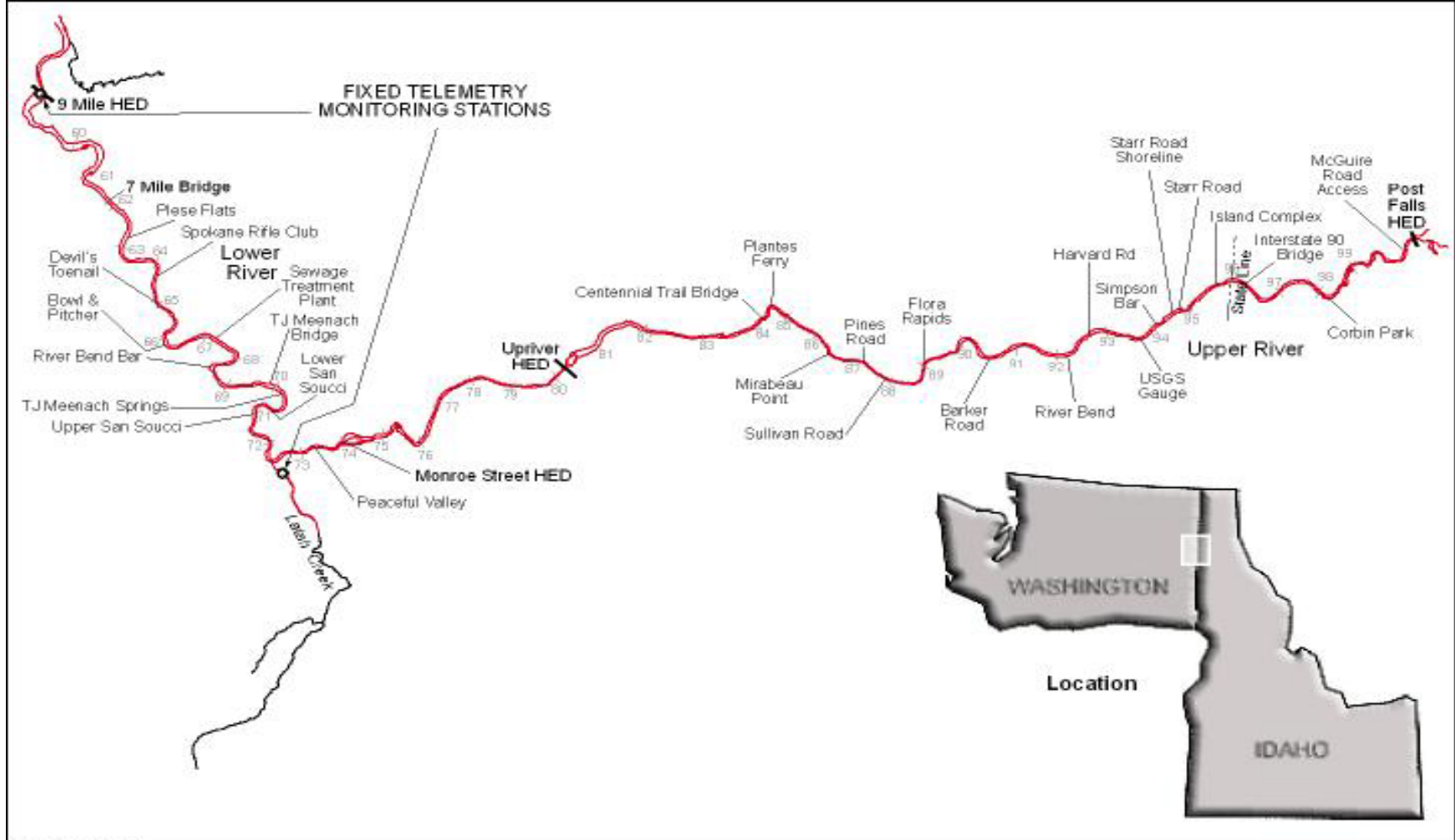
If a tag was detected in the same location for an extended period of time, we attempted to verify that the fish was still alive. These efforts consisted of surveying shoreline areas on foot to visually observe the fish and to look for tags or dead fish, or snorkeling through areas where tags were detected but adequate shoreline observations were not possible. Snorkeling surveys in areas of moving water were typically conducted by drifting down through the area where a tag was detected. If the fish was not observed during the initial drift, we used substrate material (i.e., boulders) to pull our way back upstream through the area. In areas with little or no moving water (i.e., pools and back eddies) the snorkeling surveys were conducted by swimming upstream and/or across the channel.

In addition to mobile tracking, two stationary monitoring stations were installed within the study area. One station was deployed at Nine Mile HED, with an antenna monitoring the forebay area (Figure 2). This system was installed to detect tagged fish occupying the areas near the dam and potentially passing downstream out of the study area. The other station was deployed in Latah (Hangman) Creek, at the USGS gauging station about 0.8 miles upstream of the creek mouth, to determine if tagged fish move into this creek during the monitoring period. The monitoring stations consisted of Lotek SRX\_400 radio



telemetry receivers programmed with Code-Log software (Version W30) and equipped with a 64k data storage memory, and a Cushcraft P150-4 four-element Yagi antenna. When a signal is detected, the receiver records the starting date and time, channel, code, antenna, power level, stop date and time for that signal. Data downloads from these two stationary monitoring sites typically occurred on a bi-monthly basis.

Mobile tracking surveys conducted during the spawning period identified areas occupied by tagged fish, indicating possible spawning areas. Areas favored by tagged fish were typically examined for the presence of suitable habitat and active spawning by walking along the shoreline areas. Areas too deep to effectively observe from the boat or the shoreline during the spawning period were later examined for suitable spawning habitat, signs of spawning activity, and for emergent fry when flows decreased in late May. Locating radio-tagged fish was particularly useful in the lower river reach (downstream of Monroe Street HED), because of the limited available information on spawning areas in that reach.



553-2867-00702(03)

~77 River Mile Marker



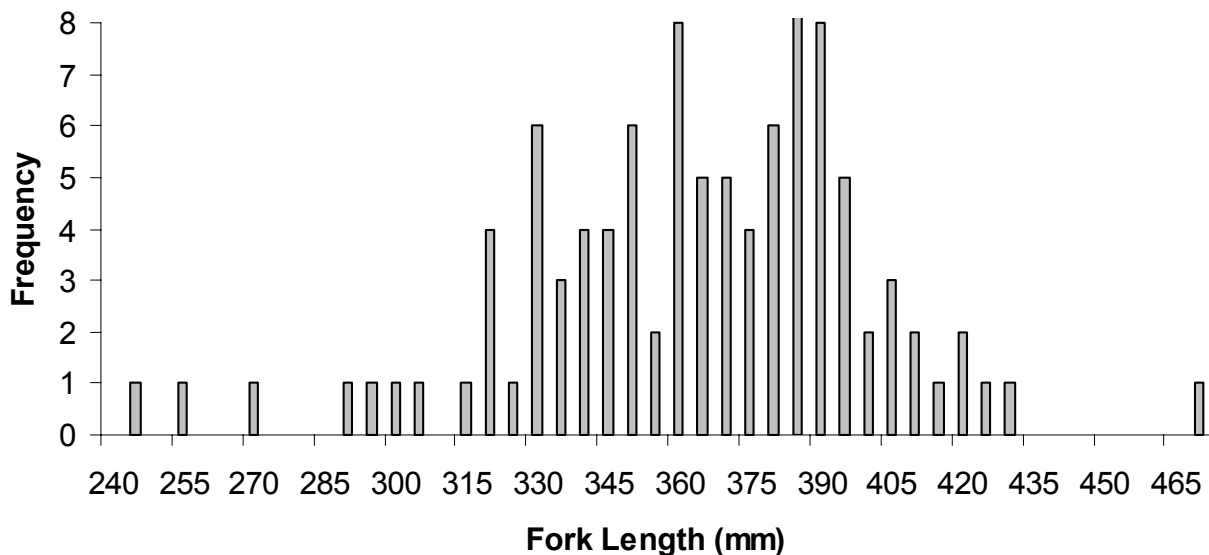
**Figure 2**  
**Upper and Lower River Study**  
**Reaches and Fixed Telemetry**  
**Monitoring Stations**

## 4. RESULTS

We conducted electrofishing sampling in the upper river study reach, from the Corbin Park boat ramp (RM 99.8) to Plantes Ferry (RM 84.6), from March 9 to 13, 2003 (see Figure 2). Within this study reach we electrofished the section from Corbin Park to Harvard Road (RM 99.8 - 92.7) five times, and the reach between Harvard Road and Plantes Ferry (RM 92.7 - 84.6) twice. In the lower river study reach, we fished between the Maple Street launch site (RM 73.3) to T.J. Meenach Bridge (RM 69.7) on March 14, and from T.J. Meenach Bridge to Plese Flats (RM 63) on March 15, 2003. We conducted additional sampling between Post Falls Dam and the Washington/Idaho border (RM 102.0 - 96.0) and between Maple Street and T.J. Meenach Bridge (RM 73.3 - 69.7), in November 2003.

### 4.1 ELECTROFISHING/TAGGING

A total of 87 adult rainbow trout were radio-tagged in 2003, with 60 fish tagged in March and 27 fish in November. During the March sampling effort, eighty-four adult rainbow trout were collected, but six were released because of injury or insufficient size. The remaining 78 fish were retained for tagging or sampling (Appendix A). We collected genetic fin clip samples from 72 of these fish, seven were sacrificed and provided to WDFW for disease assessments, and 60 were radio-tagged. The sizes of the captured rainbow trout were relatively uniform, with only three fish less than 280 mm, and eight greater than 410 mm (Figure 3), although we typically avoided netting smaller fish. In addition to the rainbow trout, 8 brown trout (*Salmo trutta*), 8 northern pikeminnow (*Ptychocheilus oregonensis*), and 1 cutthroat trout (*Oncorhynchus clarki lewisi*) were observed while shocking. Numerous mountain whitefish (*Prosopium williamsoni*) were observed in the lower river study reach, although few were noted in the upper study reach. Suckers (*Catostomous sp.*) were the most numerous species observed in both study reaches.



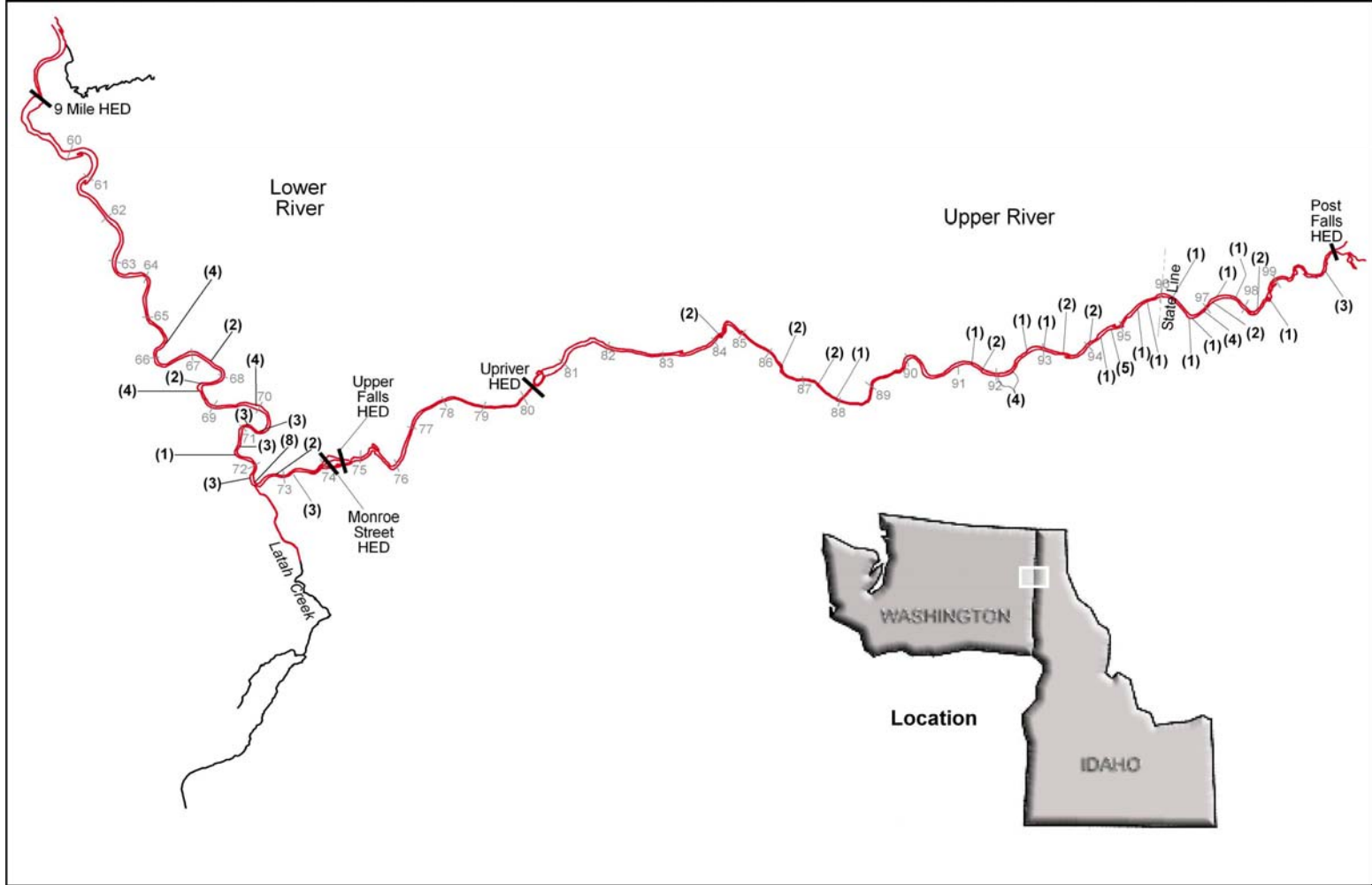
**Figure 3**  
**Length Frequency of Rainbow Trout Captured in the Spokane River, 2003**

Of the 60 fish radio-tagged in March, 31 were released in the upper river study reach and 29 in the lower river reach. The variable distribution of captured rainbow trout limited our ability to uniformly distribute the tagged fish throughout the two study reaches. In particular, only three fish were captured in the Idaho portion of the upper river reach, despite fishing the 3.7- mile reach between Corbin Park and the State Line on five occasions. The general capture and release locations of the tagged fish is summarized in Table 1, with specific release locations indicated in Figure 4.

The FWG was interested in determining whether some of the rainbow trout in the lower river study reach spawn in Latah Creek. Since fish may have migrated into Hangman Creek prior to the March tagging effort, a November tagging effort was conducted in the lower river study reach, successfully implanting tags in 13 fish. The FWG also suggested tagging additional fish in the Idaho section of the upper study reach, where we successfully tagged 14 additional rainbow trout during the November sampling effort (see Table 1 and Figure 4).

**Table 1. General Release Distribution of Radio-Tagged Rainbow Trout in the Upper and Lower River Study Reaches of the Spokane River in March and November, 2003**

<b>Study Reach (Date)</b>	<b>River Miles</b>	<b>Tagged Fish Released</b>	<b>Tagged Fish/Mile</b>
<b>Upper River Reach (March 2003)</b>			
Starr Road to Corbin Park	94.7 – 99.8	5	0.98
Harvard Road to Starr Road	92.7 – 94.7	12	6.00
Sullivan Road to Harvard Road	87.7 – 92.7	7	1.40
Plantes Ferry to Sullivan Road	84.6 – 87.7	7	2.26
<b>Lower River Reach (March 2003)</b>			
Latah Creek to Maple Street	72.2 – 73.3	9	8.18
T.J. Meenach Bridge to Latah Creek	69.7 – 72.2	8	3.20
Plese Flats to T.J. Meenach Bridge	63.0 – 69.7	12	1.79
<b>Upper River Reach (November 2003)</b>			
Corbin Park to Post Falls HED	99.8 - 102.0	4	1.81
Jacklin Seed Plant to Corbin Park	97.0 – 99.8	6	2.14
Stateline to Jacklin Seed Plant	96.1 – 97.0	4	4.44
<b>Lower River Reach (November 2003)</b>			
Latah Creek to Maple Street	72.2 – 73.3	3	2.73
T.J. Meenach Bridge to Latah Creek	69.7 – 72.2	10	4.00



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~77 River Mile Marker



**Figure 4**  
**Number (#) and Location**  
**of Radio-Tagged Rainbow**  
**Trout Releases, 2003**

## 4.2 TRACKING SURVEYS AND GENERAL RESULTS

The upper and lower study reach fish are presented and discussed separately because most of the fish remained in the study reaches where they were captured and released. Only two fish moved from the upper reach to the lower reach during the study. In addition to the separation by study reach, the March and November tag releases are also presented separately because most of the March-released fish detections occurred in 2003, and all of the detections of the November fish occurred in 2004.

### 4.2.1 Upper River Study Reach (March 2003 Fish Releases)

Preliminary tracking in the upper river study reach began on March 16, 2003, by floating downstream between Corbin Park and Harvard Road. This preliminary tracking was conducted to verify that all tags were working and detectable, to determine the initial (post-tagging) fish locations, and to establish tracking protocols. The section downstream of Harvard Road was surveyed from the Centennial Trail on March 17 to assess the efficacy of tracking from the shoreline in this reach. A total of 15 tracking surveys were conducted between April 3 and October 27, 2003 (Table 2). Tracking was conducted approximately once a week in April (peak spawning period), about twice a month from May to September, and once in October. The initial tracking in 2004 occurred on January 17, followed by weekly surveys from the second week in March through the third week in April, and bi-monthly surveys in June.

**Table 2. Tracking Surveys Conducted in the Upper River Study Reach for Fish Tagged and Released in March, 2003**

Date	Survey Reach (RM)	Survey Method	Tags Detected
3/16/03	99.8 - 92.6	Boat	14
3/17/03	84.0 - 92.6	Land-based	16
4/3/03	84.0 - 99.8	Land-based	30
4/8/03	84.0 - 99.8	Boat	31
4/16/03	84.0 - 99.8	Boat	30
4/21/03	84.0 - 99.8	Boat	29
5/7/03	84.0 - 99.8	Boat	28
5/21/03	84.0 - 99.8	Boat	28
6/7/03	84.0 - 99.8	Land-based	24 <sup>a</sup>
6/23/03	84.0 - 99.8	Land-based	24
7/8/03	84.0 - 99.8	Land-based	21
7/23/03	84.0 - 99.8	Land-based	25 <sup>a</sup>
8/5/03	84.0 - 99.8	Land-based	22
8/21/03	84.0 - 99.8	Land-based	21 <sup>b</sup>
9/3/03	84.0 - 99.8	Land-based	16 <sup>c</sup>
9/19/03	84.0 - 99.8	Land-based	14
10/27/03	84.0 - 99.8	Land-based	12
1/17/04	84.0 - 102.0	Boat	10
3/12/04	84.0 - 102.0	Boat	9
3/17/04	84.0 - 102.0	Boat	8
3/25/04	84.0 - 102.0	Boat	6 <sup>b</sup>
3/29/04	84.0 - 102.0	Boat	6
4/8/04	84.0 - 102.0	Boat	6
4/14/04	84.0 - 102.0	Boat	5
4/19/04	84.0 - 102.0	Boat	6
6/11/04	84.0 - 102.0	Boat	5
6/25/04	84.0 - 102.0	Boat	4 <sup>b</sup>

<sup>a</sup> One fish was detected in the lower river reach after 6/6, and another after 7/23/03

<sup>b</sup> One additional tag was found on shore

<sup>c</sup> Five additional tags were found on shore

Thirty of the 31 upper river study reach tags were detected during these preliminary tracking efforts, and all of the tags were detected on April 8. At least 28 of the 31 tags were detected during the boat-based surveys conducted through May 21, 2003; a period encompassing the rainbow trout spawning and immediate post-spawning periods (Parametrix 2003). Fewer numbers of tags were detected between June and October, with the fewest number of tags (12) detected on October 27. Two of the upper river study reach fish apparently passed downstream of the three HEDs separating the upper and lower river study reaches, and were subsequently detected in the lower river study reach. One of these tags (Fish 0.530) was last detected in the upper reach (at RM 93.3) on April 21, and first detected in the lower river reach (RM 71.9) on June 6. The other tag (Fish 0.700) was last detected in the upper reach (at RM 88.3) on May 21, and first detected in the lower reach (RM 68.6) on July 24.

Six of the March-release tags in the upper river study reach were recovered by October 2003. One tag (Fish 0.550) was recovered from the riverbank in August, and five tags (Fish 0.180, 0.300, 0.320, 0.370, and 0.720) were recovered in September. All six of these recovered tags were from fish tagged and released at or just downstream of Harvard Road. Two of the recovered tags were found in the river (in shallow water), three up on the riverbank, and one at the base of a utility pole upstream of Harvard Road.

Two additional March-release tags were recovered in 2004, one in March (Fish 0.210) and the other in June (Fish 1.560). Tag 0.210 was also released just downstream of Harvard Road, but the tag was recovered about 7.5 miles upstream, near Corbin Park (RM 99.5). While Tag 1.560 was recovered near its release location at Starr Road Bar (RM 94.7), it was detected about 8.5 miles downstream in the Mirabeau Point area (RM 86.2) through much of the summer of 2003. At least three of the recovered tags appeared to be the result of predation and fishing mortality, but in most cases the exact cause was not clear.

In addition to the eight recovered tags, 10 others (32%) have been undetected in the river since at least September 2003. The fate of these fish is uncertain, but fishing mortality and predation are again possible factors in the disappearance of these tags. Of the remaining tags detected in the river, all but two have been relatively stationary since at least October 2003, and are suspected of not being in active fish. The two tags that appeared to be in active fish were detected in the Mirabeau Point area (RM 86.3) in June 2004.

Attempts at snorkeling to observe the tagged fish or to recover expelled tags have been largely unsuccessful, due to the size of the river and the large substrate throughout much of the study reach. In addition, the deep-water habitat where a number of the stationary tags have been detected, also impedes the observation and recovery of tags. As a result, all of the recovered tags have been either in very shallow water or on shore.

#### **4.2.2 Upper River Study Reach (November 2003 Fish Releases)**

Tracking the November-tagged fish began with an initial survey in the upper study reach on January 17, 2004. We detected 10 of the 14 (71%) November-released tags during this initial tracking effort, although as many as 13 tags (93%) were detected during several subsequent surveys (Table 3). Two of the November-released tags were recovered on June 25. These recovered tags (Fish 1.530 and 0.310) were from fish that moved about 12 and 0.5 miles downstream of their respective release locations prior to the initial survey in January, but exhibited no subsequent movements. One tag (Fish 1.400) was not detected after the release date and another exhibited little or no movement since March 2004. The remaining 10 tags appeared to still be in active fish in June, and all were detected in known or suspected spawning areas during the 2004 spawning season (including seven that were located in Washington). After the spawning season, four fish returned to near their release locations, three moved between 1 and

10 miles further downstream to deeper water habitat, one moved back upstream to Idaho (partially back to the release location), one exhibited no subsequent movements, and one was undetected in June.

**Table 3. Tracking Surveys Conducted in the Upper River Study Reach for the 14 Fish Tagged in November, 2003**

Date	Survey Reach (RM)	Survey Method	Tags Detected
1/17/04	84.0 – 102.0	Boat	10
3/12/04	84.0 – 102.0	Boat	12
3/17/04	84.0 – 102.0	Boat	13
3/25/04	84.0 – 102.0	Boat	13
3/29/04	84.0 – 102.0	Boat	13
4/8/04	84.0 – 102.0	Boat	12
4/14/04	84.0 – 102.0	Boat	13
4/19/04	84.0 – 102.0	Boat	13
6/11/04	84.0 – 102.0	Boat	13
6/25/04	84.0 – 102.0	Boat	9 <sup>a</sup>

<sup>a</sup> Two additional tags were also recovered on 6/25/04

#### 4.2.3 Lower River Study Reach (March 2003 Fish Releases)

A total of 20 tracking surveys were conducted in the lower river study reach in 2003. Preliminary tracking also occurred on March 16 and 17, from adjacent roadways, resulting in the detection of all 29 of the lower river tags (Table 4). Subsequent tracking occurred at least weekly in April (peak spawning period), about every other week through September, and once in October. At least 27 of the 29 lower river study reach tags (93%) were detected in the lower river during the April spawning period surveys, and at least 20 tags (69%) were detected through the October survey. Two tags from the upper river study reach were also detected in the lower river reach by July, although the lack of any subsequent movements suggests that these two tags were no longer in active fish.

**Table 4. Tracking Surveys Conducted in the Lower River Study Reach for Fish Tagged in March, 2003**

Date	Survey Reach (RM)	Survey Method	Tags Detected
3/16 – 3/17/03	63-74	Land-based	29
4/2/03	63-74	Boat	23
4/3/03	71-74	Land-based	6
4/4/03	63-74	Boat	27
4/10/03	63-74	Boat	28
4/18/03	63-74	Boat	28
4/19/03	63-74	Boat	27
4/22/03	63-74	Boat	27
4/24/03	63-74	Boat	27
4/29/03	63-74	Boat	27
5/15/03	63-74	Boat	25
5/21/03	63-74	Boat	25
6/6/03	63-74	Boat	22 <sup>a</sup>
6/23/03	63-74	Boat	21



**Table 4. Tracking Surveys Conducted in the Lower River Study Reach for Fish Tagged in March, 2003 (continued)**

Date	Survey Reach (RM)	Survey Method	Tags Detected
7/9/03	63-74	Land-Based	20
7/24/03	63-74	Land-Based	23 <sup>a</sup>
8/7/03	63-74	Land-Based	22
8/20/03	63-74	Boat	21
9/4/03	63-74	Land-Based	20 <sup>b</sup>
9/19/03	63-74	Land-Based	22 <sup>c,d</sup>
10/29/03	63-74	Land-Based	21 <sup>b,d</sup>
1/22/04	63-74	Boat	20 <sup>d</sup>
3/13/04	63-74	Boat	19 <sup>b,d</sup>
3/18/04	63-74	Boat	15 <sup>c,d</sup>
3/24/04	63-74	Boat	15 <sup>d</sup>
3/30/04	63-74	Boat	14 <sup>d</sup>
4/5/04	63-74	Boat	12 <sup>d</sup>
4/9/04	63-74	Boat	13 <sup>d</sup>
4/13/04	63-74	Boat	12 <sup>d</sup>
4/16/04	63-74	Boat	12 <sup>d</sup>
4/18/04	63-74	Boat	12 <sup>d</sup>
4/23/04	63-74	Boat	12 <sup>d</sup>
4/26/04	63-74	Boat	12 <sup>d</sup>

<sup>a</sup> One upper river tag was also detected in the lower river starting 6/6, and another starting 7/25

<sup>b</sup> One additional tag was found near shore

<sup>c</sup> One additional tag was located on shore but could not be found

<sup>d</sup> Includes as many as seven detected tags exhibiting no movement behavior since August, and subsequently determined to have died or lost their tags

The 2004 tracking surveys began on January 22, followed by four surveys in March and seven in April. By April 26, nine of the March released tags (31%) were still determined to be in active fish, and the status of two other fish was undetermined (due to no obvious recent movements). Of the remaining tags, five (17%) were undetected since at least June, seven (24%) exhibited no change in location since at least August (and assumed to no longer be in active fish), and six (21%) were recovered.

#### **4.2.4 Lower River Study Reach (November 2003 Fish Releases)**

The initial tracking of the November-released tags in the lower river study reach occurred on January 22, and resulted in the detection of 12 of 13 tags (92%) (Table 5). Four additional surveys were conducted in March, and seven in April. During these subsequent tracking surveys, between 10 and 13 (77-100%) of the November-released tags were detected. Eleven of these tags (85%) were determined to be in active fish during the spawning season, while the status of the other two fish was unknown. These two fish (Fish 0.490 and 1.480) initially moved upstream or downstream from their release locations prior to the January survey, but exhibited little or no additional movement through the remainder of the 2004 monitoring period. Several of the active fish also exhibited little or no upstream or downstream movement in 2004, and they moved laterally in the same general area, occupying known or potential spawning habitat during the spawning season.

**Table 5. Tracking Surveys Conducted in the Lower River Study Reach for the 13 Fish Tagged and Released in November, 2003**

Date	Survey Reach (RM)	Survey Method	Tags Detected
1/22/04	63-74	Boat	12
3/13/04	63-74	Boat	10
3/18/04	63-74	Boat	11
3/24/04	63-74	Boat	11
3/30/04	63-74	Boat	12
4/5/04	63-74	Boat	12
4/9/04	63-74	Boat	12
4/13/04	63-74	Boat	13
4/16/04	63-74	Boat	13
4/18/04	63-74	Boat	12
4/23/04	63-74	Boat	13
4/26/04	63-74	Boat	12

### 4.3 FISH TRACKING LOCATIONS

#### 4.3.1 Upper River Study Reach (March 2003 Fish Releases)

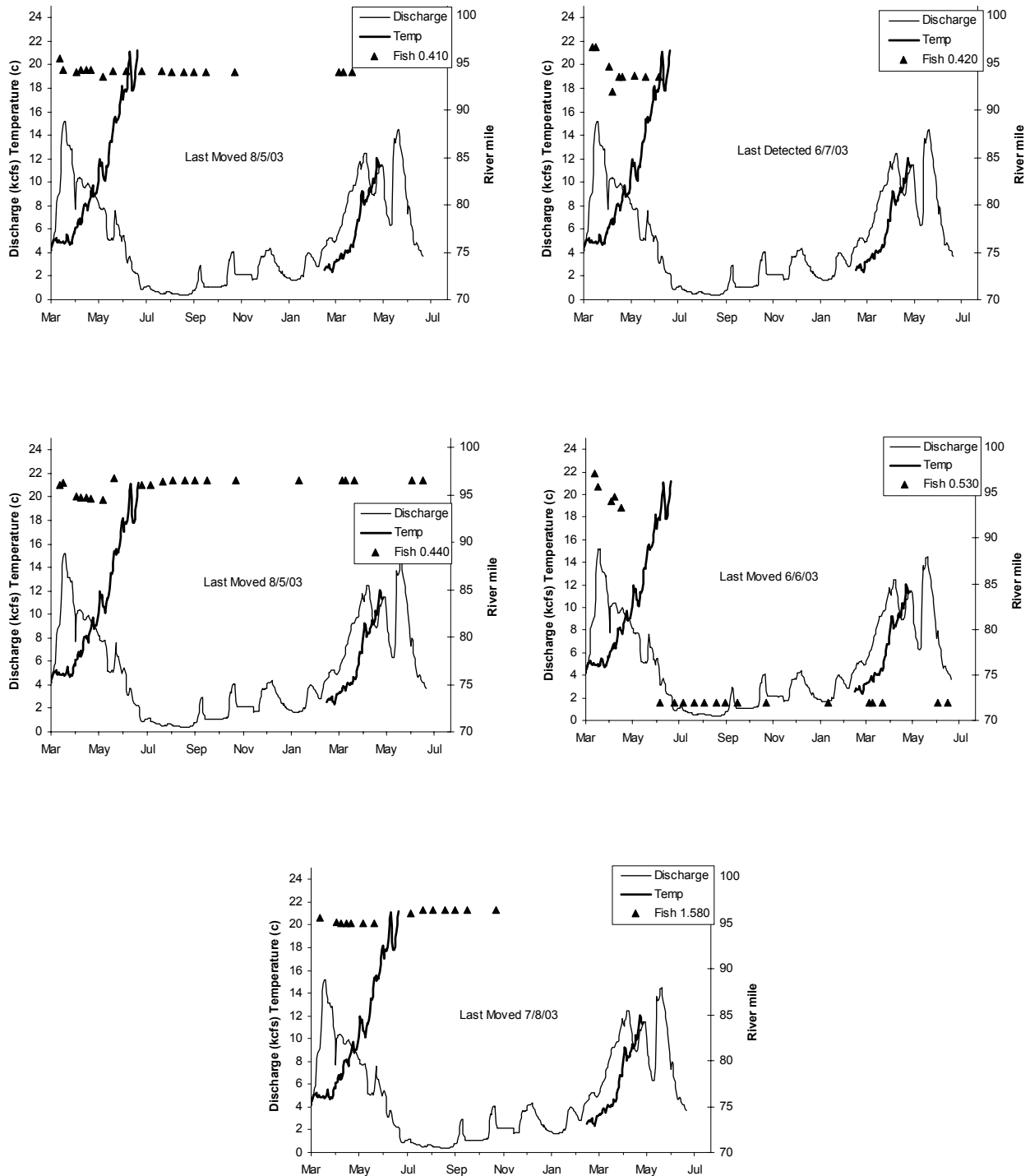
The tracking information for upper river reach fish is summarized based on the general areas that the fish were tagged and released. Fish were tagged and released in four general areas in the upper river reach in March. These areas were: from Corbin Park to Starr Road (RM 99.8 - 94.7), between Starr Road and Harvard Road (RM 92.7 - 94.7), between of Harvard Road and Sullivan Road (RM 92.7 - 87.7), and between Sullivan Road and the Centennial Trail bridge downstream of Plantes Ferry (RM 87.7 - 84.1).

##### 4.3.1.1 Corbin Park to Starr Road (RM 99.8 - 94.7)

Five fish were captured and tagged in the area upstream of Starr Road, including three at or upstream of the Idaho/Washington border (see Figure 4). All five of these fish moved downstream after release, and were detected in known spawning areas during the spawning season. The three fish tagged in the Idaho portion of the study reach moved downstream to spawning areas in Washington, during the spawning season. Two fish (Fish 0.440 and 1.580) moved back upstream, to near or upstream of the release location, after the spawning season (Figure 5). Two other fish (Fish 0.410 and 0.420) remained near these spawning areas, and the other fish (Fish 0.530) was detected about 25 miles downstream, in the lower river study reach in June. Four tags were detected through at least September, and the other was last detected on June 7. However, all five of these fish are assumed to have died or lost their tags sometime between May 21 and August 8, based on the lack of movements or detections through the summer.

##### **Fish 0.440**

We tagged and released this 382 mm male fish on March 10, just downstream of the Idaho/Washington state line at RM 96. The fish moved downstream from the release location, to the Starr Road spawning area (RM 94.7) during the spawning period, where it was detected in riffle/run habitat between April 3 and May 7. It was next detected on May 21 in riffle habitat about 2 miles upstream. While it was undetected during the following survey, it was located about 0.4 miles downstream on June 27, near the Idaho/Washington state line. The tag was detected in pool habitat in this area throughout the remainder of the monitoring period. However, no obvious movements were observed of this fish after June 27, and neither the fish nor the tag was observed during a snorkeling survey of this area on July 8. Therefore, this fish is suspected of dying or shedding its tag around June 27.



**Figure 5**  
**Tracking Locations (River Mile) of Rainbow Trout Released Between**  
**Corbin Park and Starr Road Along with Water Temperature (Degree C)**  
**and Post Falls Discharge (kcfs), 2003-04**

### **Fish 0.530**

This 427 mm female fish was tagged and released about 1 mile upstream of the Washington/Idaho border at RM 97.1, on March 13. This fish moved downstream soon after release, and was detected between Starr and Harvard roads (RM 93.3-94.6) for about two weeks (April 3-16) in pool or shoreline eddy habitat. This tag was next detected in riffle habitat just downstream of Latah Creek (RM 71.9) in the lower study reach on June 6. We observed no subsequent movements of this fish, and assume it has either died or lost its tag prior to June 6.

### **Fish 1.580**

This 386 mm male fish was released about 0.25 miles downstream of the Interstate 90 highway bridge on March 13. On April 3 this fish was detected about 0.5 miles downstream at the Island Complex spawning area (RM 95.1), where it was observed spawning on April 8. The tag was detected in this same area through May 21, and next detected in eddy/pool habitat near the Interstate 90 highway bridge (0.8 miles upstream of the release location) on July 8 in eddy/pool habitat. This fish was not observed while snorkeling in this habitat on July 8 and was located in the same pool throughout the remainder of the monitoring period. Based on this lack of movement through the summer, when water temperatures reached highs in excess of 25°C, this fish is assumed to have died or lost its tag.

### **Fish 0.410**

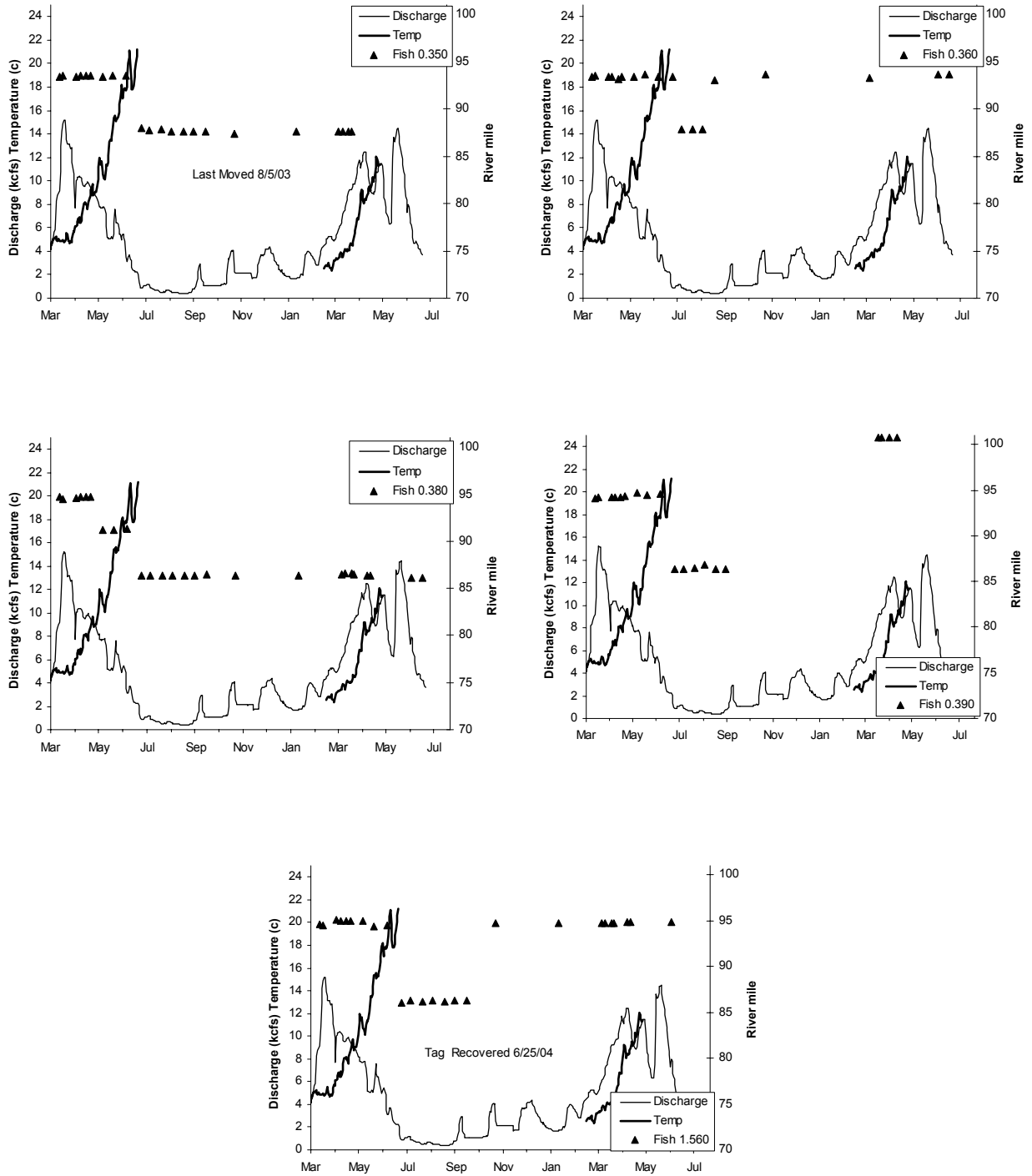
This 388 mm male fish was tagged and released on March 10, about 0.5 miles downstream of the Interstate 90 bridge, at about RM 95.5. It moved downstream soon after release, and was detected near Simpson Bar (RM 94.2) during the spawning period. It remained in this general area (between RM 93.5 and 94.2) through October. This tag was primarily detected in shoreline eddy habitat areas through April, and run/glide habitat during the summer. However, this fish exhibited no movement since at least August 5, and it is assumed to have died or lost its tag.

### **Fish 0.420**

This 387 mm female fish was tagged and released on March 11, about 0.6 miles upstream of the Interstate 90 bridge, at about RM 96.6. By April 3, this fish moved about 2 miles downstream to the Starr Road Bar spawning area. Five days later it was detected nearly 3 miles further downstream, at a gravel bar about 0.8 miles downstream of Harvard Road (RM 91.9). It was next detected on April 16 just downstream of an island about 0.8 miles upstream of Harvard Road (RM 93.5). It remained in this area, primarily in eddy habitat, through June 7 when it was last detected and assumed to be dead.

#### **4.3.1.2 Starr Road and Harvard Road (RM 94.7 - 92.7)**

Of the 12 fish tagged and released between Starr and Harvard roads, five (Fish 0.350, 0.360, 0.380, 0.390, and 1.560) exhibited similar behavior patterns (Figure 6). These fish remained near their release locations through at least late June, before moving downstream. Three of these fish (Fish 0.380, 0.390, and 1.560) moved at least 7 miles downstream to the Mirabeau Point area (RM 86.3), sometime between June 7 and 27, and remained in this area through at least September 3. The other two fish exhibiting similar behavior (Fish 0.350 and 0.360) only moved 5.5 and 5.8 miles downstream of their release locations (near Sullivan Road, RM 87.6-87.9) between June 6 and July 8. Of these downstream moving fish, only one (Fish 1.560) clearly moved back upstream by October, although the lack of any obvious movements after October suggests that this fish likely died or expelled its tag. Two other tags (Fish 0.360 and 0.390) were also subsequently detected upstream, although the status of the fish is uncertain. Fish 0.360 was periodically detected near Harvard Road between August and March, and Fish 0.390 was detected upstream near Post Falls HED beginning in March 2004. However, the detection signals were typically weak, hard to determine directional information, and detected over long reaches of the river, which are typical characteristics of tags out of water. One 372 mm male (Fish 0.520) was only detected once during the monitoring period (5 days after release) about 3 miles downstream.



**Figure 6**  
**Tracking Locations (River Mile) of Rainbow Trout Released Between**  
**Starr Road Bar and Harvard Road Along with Water Temperature**  
**(Degree C) and Post Falls HED Discharge (kcf/s), 2003**

Three other fish tagged and released between Starr and Harvard roads (Fish 0.430, 0.460, and 0.550) also moved at least 7 miles downstream, although this movement occurred at least two months earlier than the other fish released in this reach (Figure 7). The three remaining fish tagged between Starr and Harvard roads (Fish 0.400, 0.480, and 1.540), showed limited movements (< 2 miles) from the release locations during the monitoring period (see Figure 7).

#### **Fish 0.350**

This 377 mm female rainbow trout was released on March 11, about 0.5 miles upstream of Harvard Road (RM 93.4). The tag was detected in this general area through June 6, primarily in gravel bar or glide habitat. It was next detected 5.4 miles downstream on June 27, to just upstream of Sullivan Road (RM 88.0), and another 0.4 miles downstream on August 5. It was detected primarily in cobble and boulder dominated riffle/run habitat throughout the monitoring period. This fish exhibited no obvious movement after August 5, and is assumed to have died or rejected its tag.

#### **Fish 0.360**

This 410 mm male was released about 0.5 miles upstream of Harvard Road, on March 11. It remained in this area, primarily occupying gravel bar and glide habitat, through June 27. On July 8 it was detected about 5.5 miles downstream near Sullivan Road (RM 87.9), and detected in run/glide habitat in this area through August 5. On August 21 however, this tag was detected upstream near Harvard Road, although the signal appeared to be coming from an upland area. This tag was periodically detected in this same area through March 2004, but the signal continued to be weak, suggesting that it is out of the river.

#### **Fish 0.380**

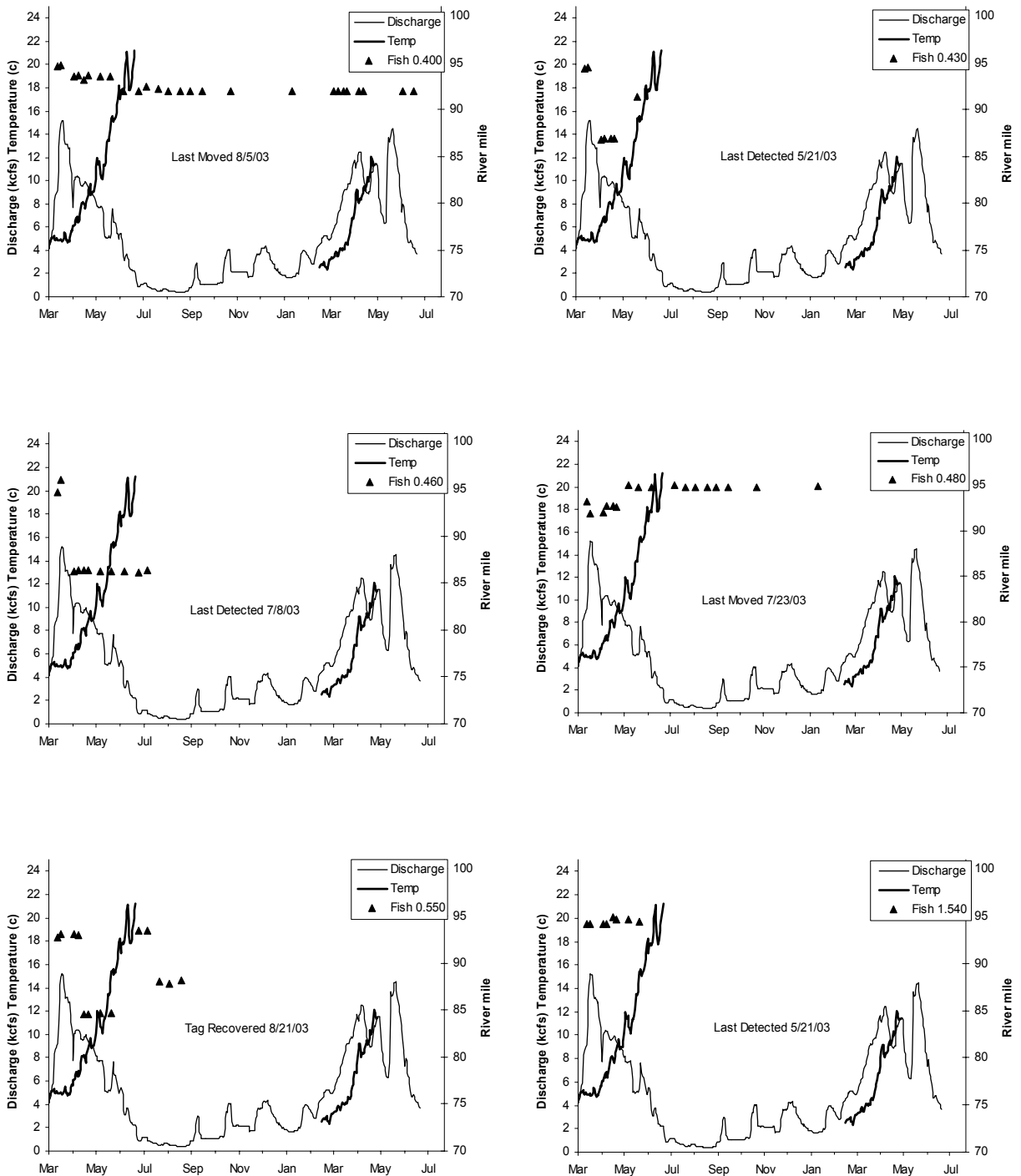
This 360 mm male rainbow trout was tagged and released just downstream of the Starr Road Bar (RM 94.7) on March 11. It was detected in this area through April 21, primarily in eddy or run/eddy areas. Between May 7 and June 7 it was detected about 3.4 miles downstream, just upstream of Barker Road (RM 91.0). It moved approximately five more miles downstream to the Mirabeau Point area (RM 86.4) by June 27, where it remained through September, occupying run/glide or riffle habitats with primarily boulder and cobble substrate. It was next detected in the Mirabeau Point pool between January and mid-March, but moved just upstream to run/glide habitat from mid-March through the 2004 spawning season. It was next detected in June, back in the Mirabeau Point pool.

#### **Fish 0.390**

Fish 0.390 was released along the left bank downstream of the Starr Road Bar spawning area, on March 10. It remained in this area through April 21, primarily occupying eddy habitat, but was detected about 0.5 miles upstream in similar habitat through June 7. It was next detected on June 27 about 7.8 miles downstream to the Mirabeau Point area, occupying run, glide or riffle habitats with primarily boulder and cobble substrate through September 3. While this fish was subsequently detected about 14 miles upstream, between March 25 and April 19, 2004 the signals were weak and erratic, indicating that the tag was likely out of the water.

#### **Fish 1.560**

This 403 mm male was released downstream of Starr Road Bar (RM 94.6) on March 13. By April 3 it had moved about 0.4 miles upstream to the Island Complex spawning area, and remained in this area through May 7. Through June 7, it was detected back near Starr Road Bar, but by June 27 it was about 8 miles downstream in the Mirabeau Point area (similar to Fish 0.380 and 0.390). It remained in this area through September 19, in pool, glide, or run habitats dominated by boulder and cobble substrate. By October, the tag was detected back upstream to near the release location, where it was also detected between January and April 2004. However, the lack of any obvious movements after October suggests that the fish had died or lost its tag.



**Figure 7**  
**Tracking Locations (River Mile) of Rainbow Trout Released**  
**Between Starr Road Bar and Harvard Road Along with Water**  
**Temperature (Degree C) and Post Falls HED Discharge (kcfs), 2003**

**Fish 0.400**

This 381 mm male moved about 0.1 miles upstream of the release site (RM 94.6), between March 10 and 16, and moved about 1 mile downstream by the first week in April. It was detected primarily in eddy habitat in this area (RM 93.2 – 93.7) through May 21, before moving about 1.5 miles further downstream, to the river bend downstream of Harvard Road (RM 92). While in this area it was detected in run, riffle, or glide habitat. No obvious movements were observed of this fish after June 7, and neither the fish nor the tag was observed during a snorkeling survey conducted in this area on August 5. As a result, this fish is assumed to have died or expelled its tag.

**Fish 0.430**

This 319 mm female, released downstream of Starr Road Bar (RM 94.4), migrated to downstream of Pines Road (RM 87.4), or within 0.6 miles of Mirabeau Point (RM 86.8) by April 3. It was detected in that area through April 21, undetected on May 7, and detected for the last time on May 21 between Barker and Harvard roads (RM 91.3).

**Fish 0.460**

This 408 mm female was released downstream of Starr Road Bar (RM 94.6), on March 10. On March 16, it was detected in a riffle area about 1.3 miles upstream, near the Idaho/Washington border. However, by April 3 it had moved nearly 10 miles downstream to the Mirabeau Point area, and remained primarily in eddy/pool habitat in this area until it was last detected on July 8.

**Fish 0.480**

This 381 mm male was the only fish released between Starr Road Bar and Harvard Road and eventually detected a substantial distance (about 1.6 miles) upstream from the release site during the summer. Prior to moving upstream however, it was detected for about 3 weeks near the Harvard Road spawning area (RM 92.7). It moved over 2 miles upstream to the Island Complex spawning area (RM 95) by May 7, where it was detected throughout the monitoring period, primarily in cobble dominated riffle/glide habitat. In addition to the lack of movements of this fish through the summer, neither the fish nor the tag was observed during snorkel surveys conducted in the area on August 5 and 21, indicating that it was no longer alive or had expelled its tag.

**Fish 0.550**

This 378 mm female was detected just upstream of the Harvard Road release location at RM 92.9, through the first week in April, in shoreline eddy habitat. By April 16, it moved about 8 miles downstream to Plantes Ferry (RM 84.5), where it was detected for about a month (through May 21). It was next detected about 0.7 miles upstream of the release area on June 27, and also detected in this same area two weeks later. By July 23 it had again moved back downstream, this time to the Sullivan Road area (RM 88.0) and detected in this same area through August 21. On August 21, the fish was observed in a pool in this area, which likely provided thermal refuge from the warm water temperatures because over 100 other adult trout were observed in this area. However, the tag was found up on the riverbank the following morning.

**Fish 1.540**

This 397 mm female stayed near the release location (RM 94.2) until April 8, before moving about 0.5 miles upstream to the Island Complex spawning area by April 16, and the Starr Road Bar spawning area between April 21 and May 21, when it was last detected.



### **4.3.1.3 Harvard Road to Sullivan Road (RM 92.7 - 87.7)**

Eight fish were tagged and released in this river reach on March 12 (see Figure 4). However, the tags from five of these fish were recovered from the streambed or the riverbank in September, and another in March 2004. Two of these recovered tags (0.180 and 0.300) were from fish that exhibited no substantial movement after release (Figure 8). A third fish (Fish 0.210) also exhibited no movement after release, and was undetected after July 8, but recovered about 8 miles upstream in March 2004. Two other fish (Fish 0.320 and 0.340) moved greater than 2.5 miles upstream to known spawning areas during the observed spawning period, although one tag (0.320) was recovered upstream of the release location in September. Two other fish (Fish 0.370 and 0.720) moved at least 1 mile downstream soon after release, but their tags were found on the riverbank in these same areas in September. Tag 0.700 was last detected in the upper river study reach on May 7, but was later detected in the lower river study reach beginning on July 24.

#### **Fish 0.180**

This 390 mm female rainbow trout was tagged and released about 0.25 miles downstream of Harvard Road on March 12 (RM 91.5). It moved about 0.1 miles downstream to an eddy upstream of Barker Road by April 8, where it remained through June 27. Between July 8 and August 5 it was detected in riffle habitat about 0.3 miles upstream (RM 91.6), and subsequently moved about 0.3 miles downstream by August 21, where the tag was recovered from the river on September 3.

#### **Fish 0.210**

This 358 mm female remained within 0.3 miles of the release location (RM 91.7) between March 12 and July 8. Through April, this fish was typically detected in run/eddy areas, and in riffle and glide habitat in late June and early July. The fish was not observed during a snorkel survey in this detection area on July 8, and the tag was undetected between July 8 and March 12, 2004 when it was detected upstream of Corbin Park. There did appear to be some movement between March 12 and 17, 2004, however, the tag was recovered slightly downstream of this location on March 25. It is uncertain when the fish moved to this area, or when it may have died or lost its tag.

#### **Fish 0.300**

This 343 mm male was tagged and released on March 12, about 700 ft downstream of Harvard Road (RM 92). It stayed within 0.4 miles of the release location, occasionally moving up and downstream through June 7. During that time, it was primarily located in run and eddy habitat. After June 7 it was detected primarily in riffle and run habitat areas, also near the release location. This fish was not observed during snorkel surveys conducted on July 8 and August 5, and the tag was recovered from the river near this location on September 3.

#### **Fish 0.320**

We tagged and released this 340 mm male, about 400 ft downstream of Harvard Road (RM 92.3), on March 12. It moved over 1.2 miles upstream by April 3, but was detected about 0.7 miles downstream in the Harvard Bar spawning area (RM 92.7) several days later. It remained at this location through much of the spawning period, but was detected about 4.3 miles upstream (RM 97) on May 7. About a month later, it was detected over 12 miles downstream, near Plantes Ferry (RM 84.7), before moving back upstream of Harvard Road within three weeks, where it was detected between June 27 and September 3. The tag was found at the base of a utility pole in this area on September 19, suggesting the fish was taken by an avian predator.

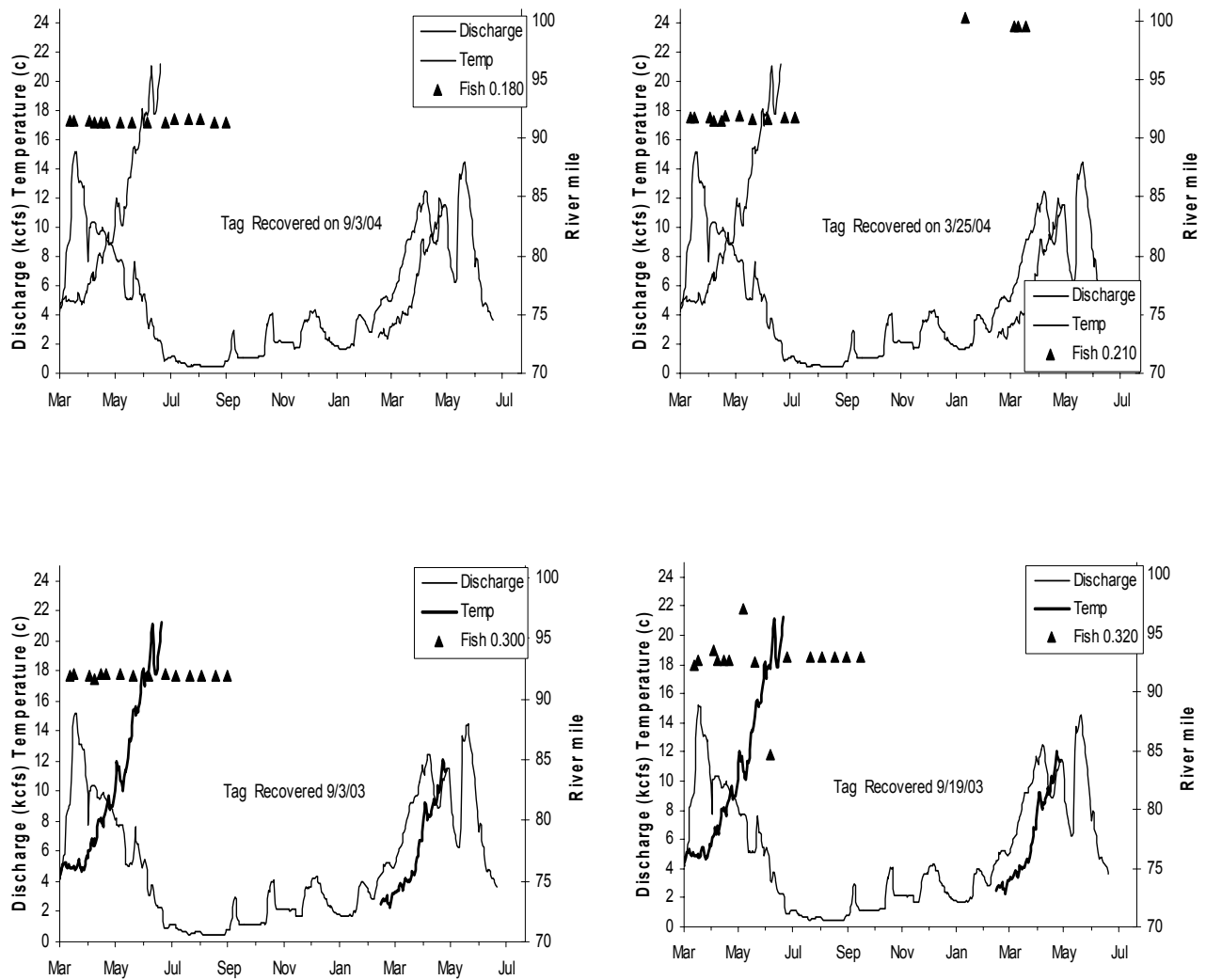
#### **Fish 0.340**

This 377 mm male rainbow trout, released about 600 ft downstream of Harvard Road (RM 92.1) moved about 2.6 miles upstream of the release location, to the Starr Road Bar spawning area between April 3 and 8. About a week later, it was detected back near the release location. It remained in this location, primarily in cobble/boulder dominated run/glide habitat, through October. Attempts to visually observe

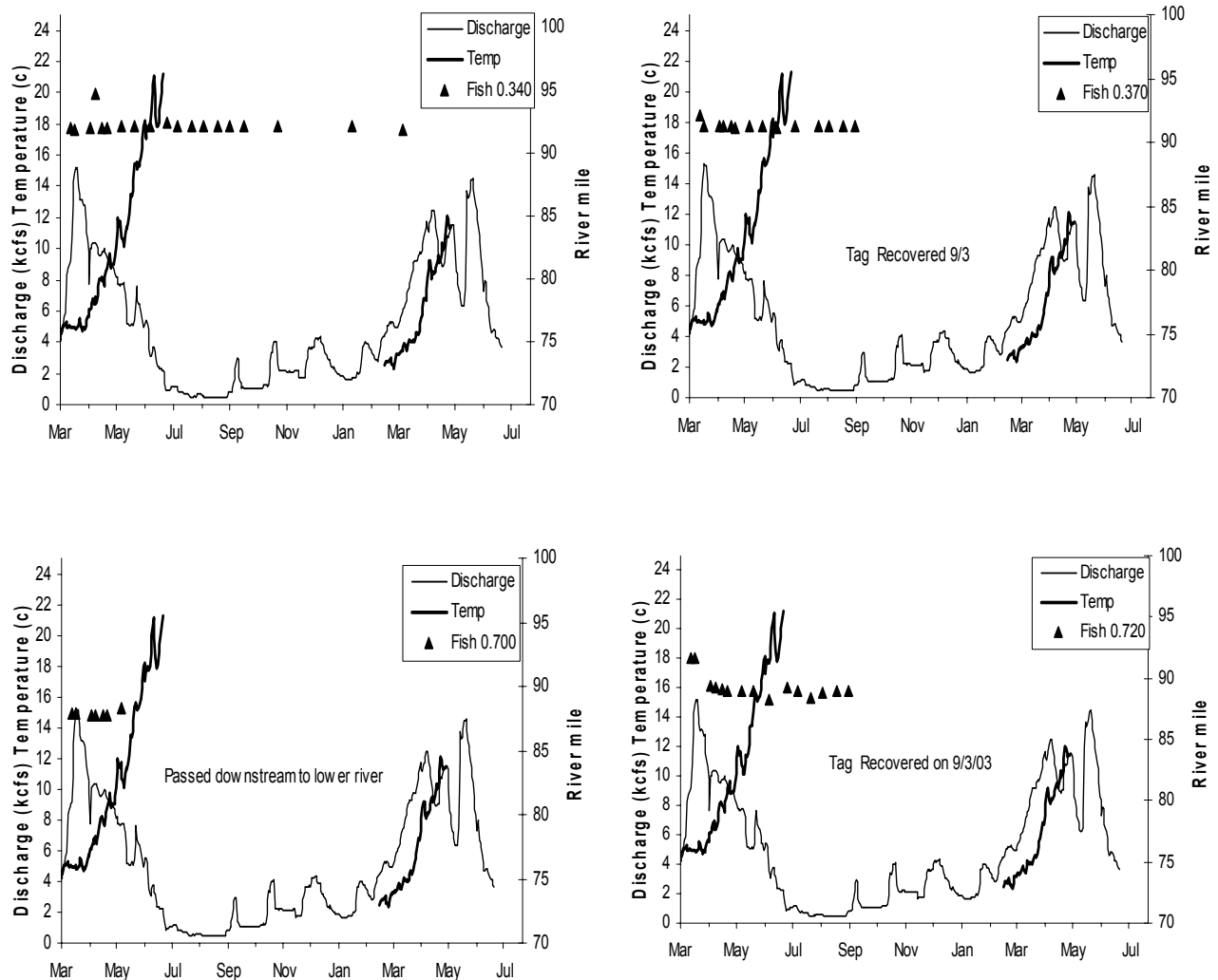
this fish during the summer land-based surveys, and snorkel surveys in July and August were unsuccessful, and no movement occurred through the 2004 spawning season, so this fish is assumed to have died or lost its tags after the 2003 spawning season.

**Fish 0.370**

This 368 mm male moved about 1 mile downstream of the release location (RM 92.2), to near the Barker Road power lines (RM 91.2), within 5 days of release. The tag was detected primarily in glide habitat in this area, through August 21, and recovered on the riverbank in this area on September 3. The tag location and condition suggests that this fish was consumed by a predator.



**Figure 8**  
**Tracking Locations (River Mile) of Rainbow Trout Released Between Harvard Road and Sullivan Road Along with Water Temperature (Degree C) and Post Falls HED Discharge (kcfs), 2003**



**Figure 8 (continued)**  
**Tracking Locations (River Mile) of Rainbow Trout Released Between Harvard Road and Sullivan Road Along with Water Temperature (Degree C) and Post Falls HED Discharge (kcfs), 2003**

**Fish 0.700**

This 348 mm male was tagged and released just upstream of Sullivan Road (RM 87.9). It moved about 0.2 miles downstream of Sullivan Road by April 3, and remained in this area (primarily in eddy habitat) until May 7. It was undetected between May 21 and July 8, but was detected over 19 miles downstream in the lower river study reach at Riverbend Bar (approximately RM 68) after July 8. While in the lower river study reach, this fish appeared to be actively moving around the Riverbend Bar area, primarily occupying pool and run habitat, through at least August. However, no obvious movement was detected through the 2004 monitoring period, indicating that the fish died or lost its tag.

### **Fish 0.720**

This 292 mm male trout moved downstream about 2.3 miles (to the Flora Rapids area, about RM 89) within 3 weeks of release, and except for moving about 0.5 mile further downstream on two separate occasions, it remained in the Flora Rapids area. While in the Flora Rapids area, this fish was detected at the head end of the rapids in May, in run habitat during June, and riffle habitat in August. However, the tag was found on the riverbank on September 3 in the Flora Rapids area. Although it is uncertain how long the tag had been on the bank, the fish apparently moved about 0.5 miles between July 23 and August 21. In addition, it was last detected near the left bank on August 21, while the tag was recovered on the right bank. This suggests that the fish was still alive on August 21.

#### **4.3.1.4 Sullivan Road to Plantes Ferry (RM 87.7 - 84.6)**

Six rainbow trout were tagged and released in this reach on March 12 (see Figure 4). Four of these fish (Fish 0.640, 0.740, 0.760, and 0.780) exhibited limited movement from their release areas during the spawning season (Figure 9). Of these four fish, two were released near Pines Road (RM 87.2), one in the Mirabeau Point eddy (RM 86.3), and one near Plantes Ferry (RM 84.3). In contrast, the other two fish (Fish 0.660 and 0.680) moved at least 2.0 miles upstream during the spawning period.

### **Fish 0.640**

This 385 mm female trout was tagged and released just upstream of Pines Road (RM 87.2) on March 12, and remained within 0.2 miles of the release point until it was last detected on June 27. During this time, it was primarily located in eddy habitat.

### **Fish 0.660**

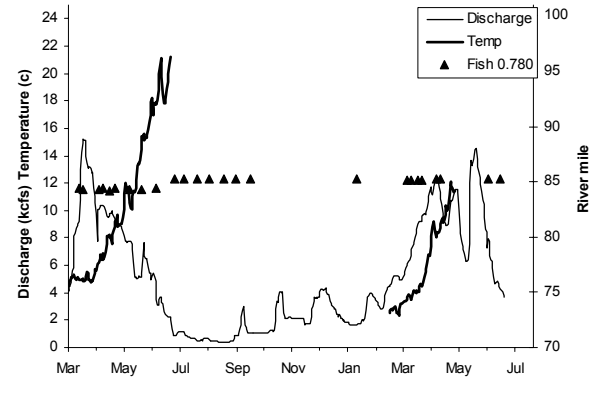
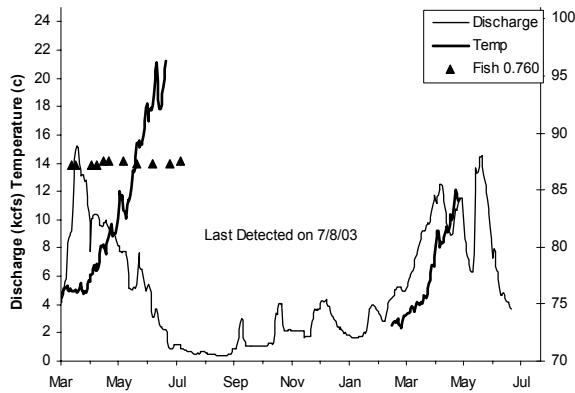
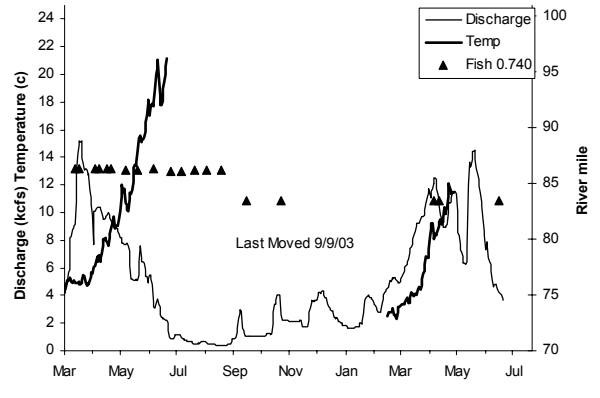
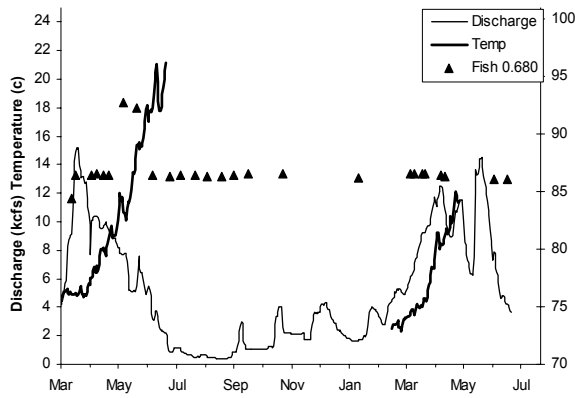
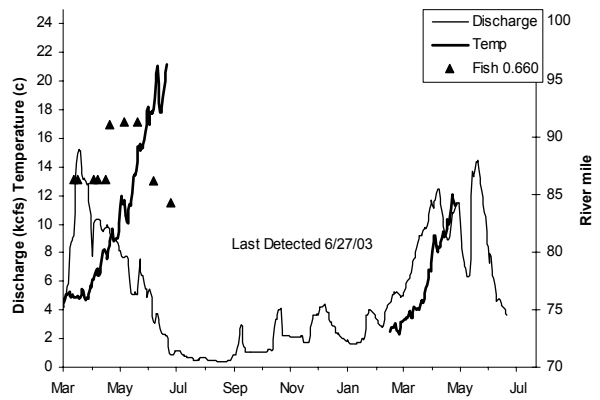
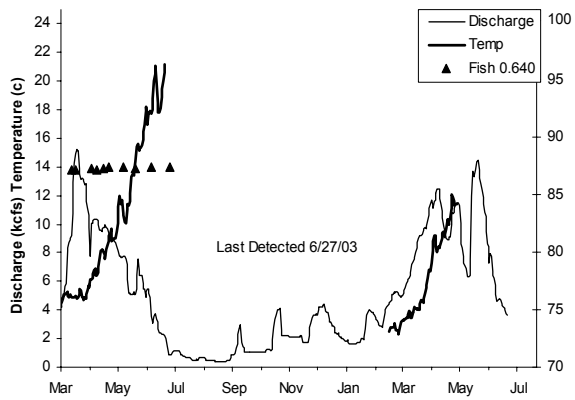
This 395 mm female was detected near the Mirabeau Point release site through April 16, after which it moved about 5 miles upstream to the Barker Road area (RM 91). It remained in that area for about a month (through May 21) before moving back down to near the release location by June 7, and about 2 miles further downstream (near Plantes Ferry) by June 27. However, it was not detected after the June 27 survey.

### **Fish 0.680**

This fish was released at Plantes Ferry (RM 84.4), and migrated about 2 miles upstream to the Mirabeau Point pool area within 5 days of release. It remained in that area for about a month (April 21), before migrating about another 6 miles upstream to near Harvard Road by May 7. It was detected near Harvard Road again on May 21, before migrating back down to the Mirabeau Point pool area by June 7, where it remained through the monitoring period. In late June and early July, this fish was detected in a riffle habitat upstream of the Mirabeau Point area, moving to boulder and cobble dominated glide/run habitat through September, and back in the Mirabeau Point pool in January. Immediately before and during the 2004 spawning season (March 12 to April 19), this fish was located about one-quarter mile upstream of Mirabeau Point pool, but was located back in the Mirabeau pool in June.

### **Fish 0.740**

This 393 mm female was released in the Mirabeau Point eddy area (near the downstream end of the Kaiser plant, RM 86.3), and remained in this area through August 21. During June and July, it was primarily detected in pool habitat, but in boulder and cobble dominated glide habitat in August. Although it was not detected during the following survey (September 3), it was detected about 2.8 miles downstream in the Upriver HED pool (about RM 83.5) after September 19. The lack of movement, from September through the 2004 spawning season, indicates that the tag was not in an active fish.



**Figure 9**  
**Tracking Locations (River Mile) of Rainbow Trout Released Between Sullivan Road and Plantes Ferry, Along with Water Temperature (Degree C) and Post Falls HED Discharge (kcf/s), 2003**

### **Fish 0.760**

This 304 mm female was tagged and released at the same location as Fish 0.640, and also remained near the release location (within 0.4 miles) until it was last detected on July 8. During this period, it occupied eddy and run habitat.

### **Fish 0.780**

This 389 mm male was one of two fish released near Plantas Ferry at RM 84.4. It remained in this area, primarily in eddy habitat, through June 7, 2003. On June 27 it was located about 0.9 miles upstream, near the Trent Bridge (RM 85.3) where it was detected in cobble and boulder dominated run/glide habitat throughout the monitoring period. Although it was detected in the same area through the 2004 spawning season, periodic movements around the general area were detected.

## **4.3.2 Upper River Study Reach (November 2003 Fish Releases)**

Fish were tagged and released in three general areas in the upper river study reach in November 2003, all of which were in Idaho portion of the Spokane River. These three release areas were between Post Falls HED and Corbin Park (RM 102.0 – 99.8), Corbin Park to the Jacklin Seed plant (RM 99.8 – 97.0), and Jacklin Seed to the Stateline (RM 97.0 and 96.1).

### **4.3.2.1 Post Falls HED to Corbin Park (RM 102.0 – 99.8)**

Four fish were tagged and released in this 2.2-mile reach between November 18 and 20, 2003 (see Figure 4). The first monitoring survey occurred about two months later, although only one of these fish (Fish 0.110) was detected during that survey (Figure 10). While one fish (Fish 1.400) was not detected after release until after the 2004 spawning season, two others (Fish 1.420 and 1.950) were detected downstream and another (Fish 0.110) upstream of their respective release locations during the 2004 spawning season. The two fish that moved downstream were located downstream of the state line during the spawning season, with only one moving back upstream by late April.

#### **Fish 0.110**

This 420 mm fish was tagged and released on November 20, just downstream of the McGuire Road (RM 100.7). Although it was detected in the same area in January, by March it had moved upstream to near the Post Falls HED powerhouse, occasionally moving between the south and north river channels, through the 2004 spawning period.

#### **Fish 1.420**

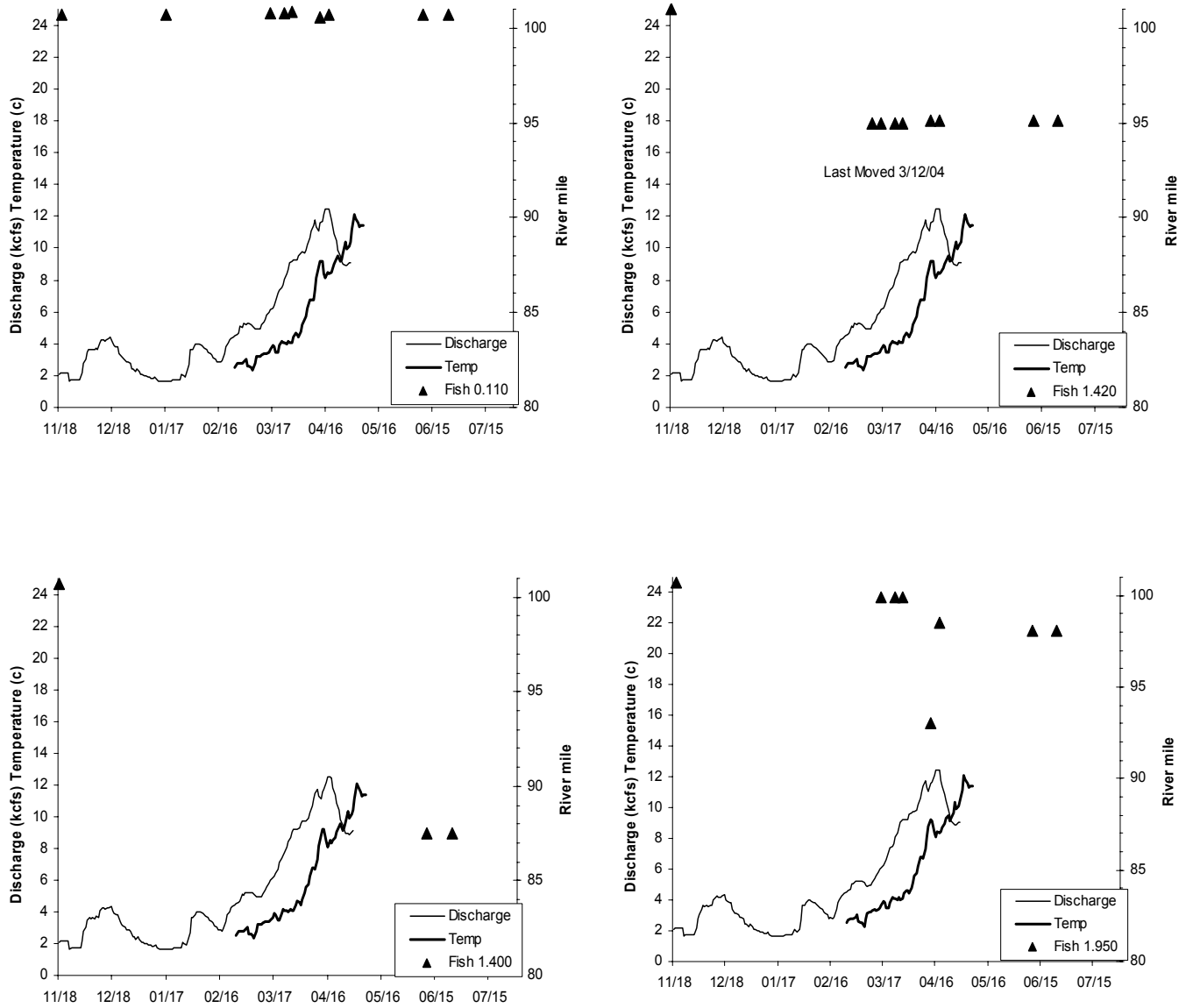
This 395 mm rainbow trout was tagged and released on November 18, just downstream of the McGuire Road (RM 100.7). While it was not detected in January, it was located downstream in Washington, in the Island Complex spawning area in March. However, the lack of subsequent movements through the spawning period indicates that the fish may have died or lost its tag, although it is uncertain whether this happened before or after spawning.

#### **Fish 1.400**

This 379 mm rainbow trout was tagged and released on November 18, just downstream of the McGuire Road (RM 100.7). This tag was not detected through the 2004 spawning season, but was detected about 13 miles downstream of the release point (near Sullivan Road) in June.

#### **Fish 1.950**

This 353 mm rainbow trout was tagged and released on November 20, just downstream of McGuire Road (RM 100.7). While it was not detected in January, it was located slightly downstream of the release location in March and early April. On April 14 it was located in Washington, upstream of Harvard Road (RM 93.0), before moving back upstream the following week to near the Pleasant View Bridge (RM 98.5).



**Figure 10**  
**Tracking Locations (River Mile) of Rainbow Trout Released**  
**Between Post Falls and Corbin Park, Along with Water**  
**Temperature (Degree C) and Post Falls HED Discharge (kcfs)**

#### **4.3.2.2 Corbin Park to Jacklin Seed Plant (RM 99.8 – 97.0)**

Six fish were tagged and released in this 2.8-mile reach on November 20, 2003 (see Figure 4). All six of these tags were detected during the first monitoring survey in January (Figure 11). Four of these tags were detected downstream in Washington, near known spawning areas, during the 2004 spawning season, while the other two remained close to their release locations.

##### **Fish 0.540**

This 405 mm fish was tagged and released on November 20, just upstream of the Pleasant View Bridge (RM 98.6). By January 17, the tag was detected in Washington, downstream of Harvard Road (RM 92.1). It remained within about one mile of Harvard Road through the 2004 spawning season, in run/glide habitat, including the Harvard Road spawning area on April 14. A week later, it was detected in eddy habitat upstream of Barker Road (RM 91.35), where it was also detected in June.

##### **Fish 0.310**

This 415 mm rainbow trout was tagged and released on November 20, just upstream of the Jacklin Seed Plant (RM 97.8). The tag was detected in January about one-half mile downstream of the release location, and remained in riffle/glide habitat in this general area through the spawning season. However, no signs of spawning activity were observed in this area in 2004. No subsequent movements were observed of this fish, and the tag was recovered from this same area on June 25.

##### **Fish 1.530**

This 387 mm rainbow trout was tagged and released on November 20, just downstream of the Jacklin Seed Plant (RM 97.3). On January 22, it was detected about 12 miles downstream in run habitat, near Trent Bridge (RM 85.5), and remained in this area through the 2004 spawning season. No subsequent movements were observed of this fish, and the tag was recovered from this same area on June 25.

##### **Fish 1.590**

This 388 mm rainbow trout was tagged and released on November 20, just downstream of the Pleasant View Bridge (RM 98.4). This tag was detected in eddy habitat about one-half mile downstream of the release location between January and early March, and moved back upstream to riffle habitat near the release location by mid-April. No spawning was observed in the areas occupied by this fish in April. The fish was detected in this same general area in June, although in eddy habitat.

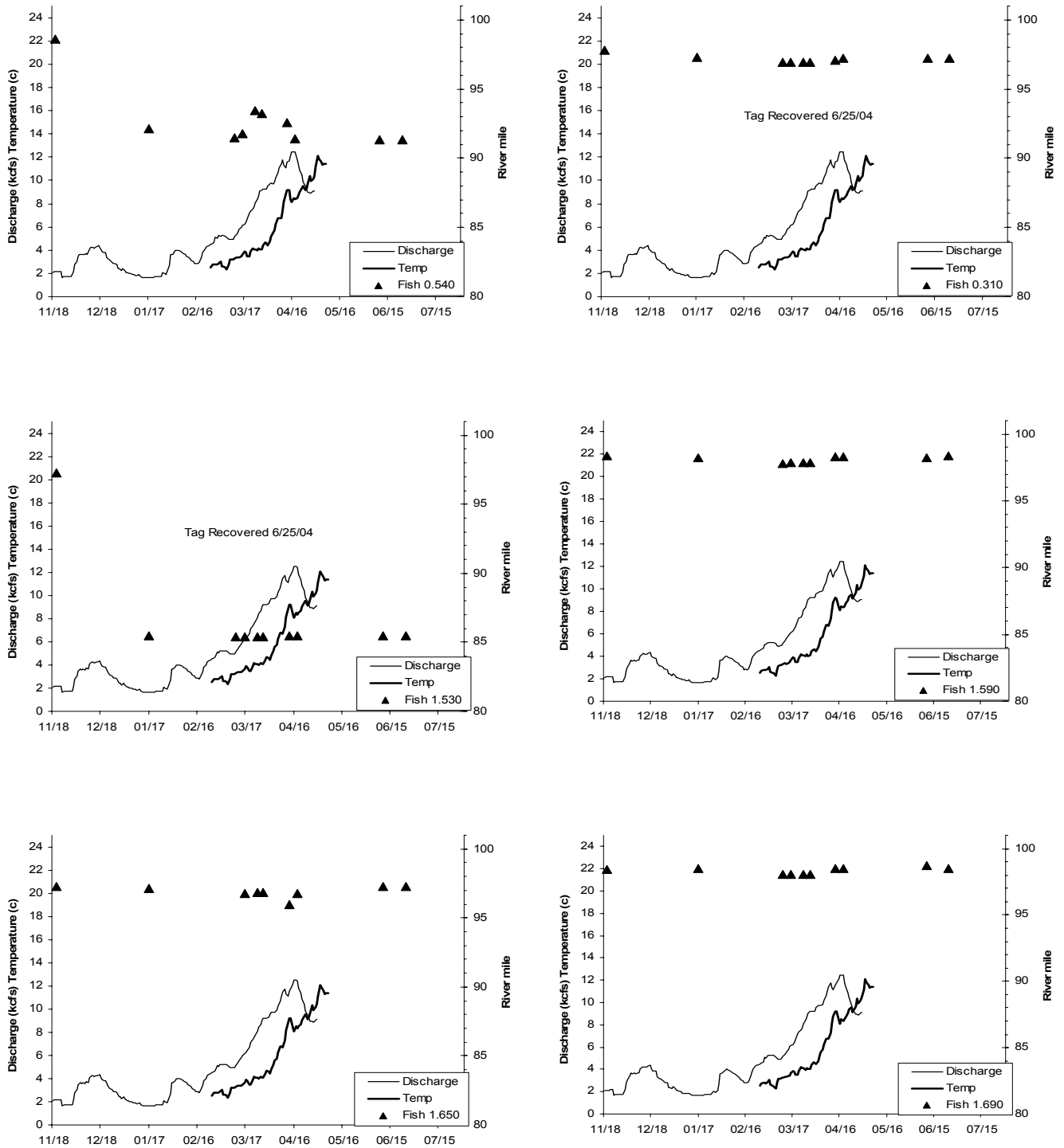
##### **Fish 1.650**

This 362 mm rainbow trout was tagged and released on November 20, just downstream of the Jacklin Seed Plant (RM 97.3). While located close to the release location in January, it was detected about one-half mile downstream of the Idaho/Washington state line between March and early April near the Island Complex spawning area (RM 95.5). Between April 8 and 19, the fish was detected gradually moving upstream and occupying primarily glide or riffle habitat. It was next detected in June near the release location in riffle habitat.

##### **Fish 1.690**

This 392 mm rainbow trout was tagged and released on November 20, just downstream of the Pleasant View Bridge (RM 98.4). It was detected slightly upstream of the release location in January, and about 0.4 miles downstream between mid-March and early April, before returning to near the release location by mid-April. During March and early April, it was located in an area of inundated vegetation. While this habitat type is frequently used for rainbow trout spawning in other areas of the Spokane River, no spawning behavior was observed in this area in 2004.





**Figure 11**  
**Tracking Locations (River Mile) of Rainbow Trout Released**  
**Between Corbin Park and Jacklin Seed Plant, Along with Water**  
**Temperature (Degree C) and Post Falls HED Discharge (kcms)**

#### **4.3.2.3 Jacklin Seed Plant - Stateline ( 97.0 – 96.1)**

Four fish were tagged and released in this 0.9-mile reach on November 20, 2003 (see Figure 4). Three of the four tags were detected during the first monitoring survey in January, while all four were detected in March and April (Figure 12). All four of the tags were detected in known Washington State spawning areas during the 2004 spawning season (Island Complex, Starr Road, Simpson Bar and Sullivan Road spawning areas). Two of the fish (Fish 0.280 and 1.450) moved at least 2 miles downstream, and one (Fish 0.300) move about 3 miles upstream, by June. The fourth was undetected after April 19.

##### **Fish 0.280**

This 382 mm fish was tagged and released on November 20, just upstream of the Idaho/Washington State Line (RM 96.8). In January, the fish was located about 10 miles downstream of the release location, to run habitat just upstream of the Mirabeau Point pool (RM 86.3). The fish moved about 3 miles upstream to the Flora Rapids area (RM 88.7) by mid-March, occupying eddy and riffle habitat. By late March the fish moved further upstream to near Barker Road (RM 91.1), and about 3 miles further upstream to the Simpson Bar spawning area by April 8. About a week later it was detected back downstream near Flora Rapids (RM 88.7), and by June 11 it had returned to the Mirabeau Point pool area. However, it was undetected on June 25.

##### **Fish 0.300**

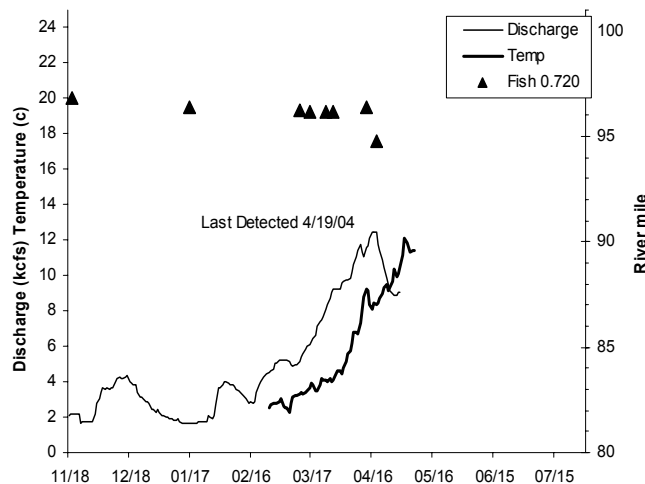
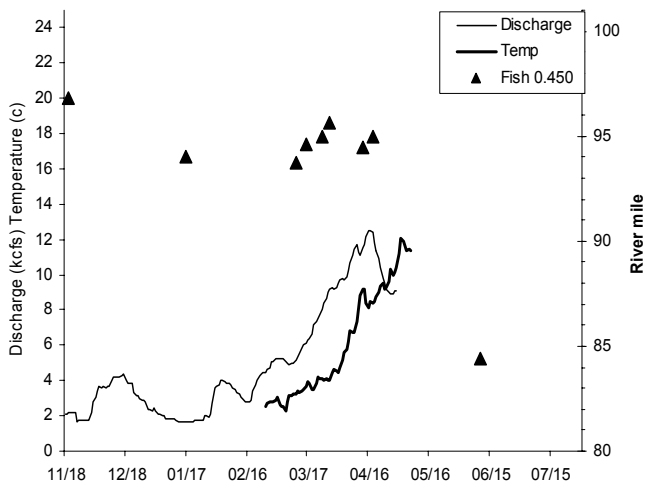
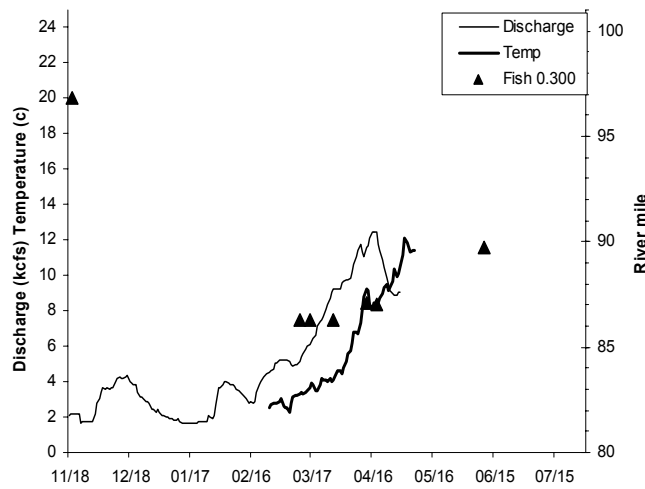
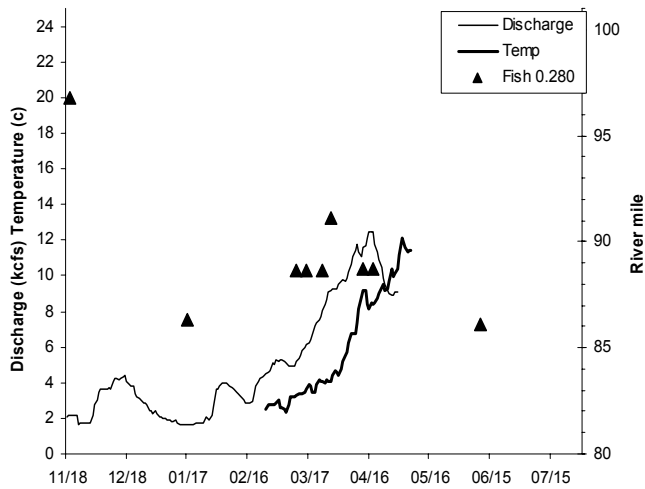
This 343 mm rainbow trout was tagged and released on November 20, just upstream of the Idaho/Washington border (RM 96.8). The first detection was on March 12, over 10 miles downstream of the release location to the Mirabeau Point pool area (RM 86.3), where it was detected through March 29. By April 8, it had moved about 0.6 miles upstream (to near Sullivan Road), and remained in this area through the spawning season. By June 11, the fish moved about 3 miles upstream, at the upper end of Flora Rapids, but was undetected on June 25.

##### **Fish 0.450**

This 402 mm rainbow trout was tagged and released on November 20, just upstream of the Idaho/Washington border (RM 96.8). This tag was detected primarily in glide/run habitat, between Simpson Bar and the state line, through March 29, and in the Island Complex spawning area (RM 94.5-95.0) during the spawning season. By June 11 it was detected about 10 miles downstream near Plantess Ferry (RM 84.4), but was undetected on June 25.

##### **Fish 0.720**

This 468 mm rainbow trout was tagged and released on November 20, just upstream of the Idaho/Washington border (RM 96.8). This fish was detected in pool habitat near the Interstate 90 highway bridge (RM 96.4) on January 17, and about 0.2 miles further downstream (in similar habitat) between March 12 and April 8. However, by April 19 it had moved downstream to the Starr Road Bar spawning area (RM 94.8), but was undetected on June 11 and 25.



**Figure 12**  
**Tracking Locations (River Mile) of Rainbow Trout Released**  
**Between Jacklin Seed Plant and State Line, Along with Water**  
**Temperature (Degree C) and Post Falls HED Discharge (kcfs)**

### **4.3.3 Lower River Study Reach (March 2003 Fish Releases)**

Fish were tagged and released in three general release areas in March 2003, in the lower river study reach. These three areas were from the Maple Street put-in (RM 73.3) to near the mouth of Latah Creek (RM 72.4), between Latah Creek and T.J. Meenach Bridge (RM 72.2 - 69.7), and downstream of T.J. Meenach Bridge (RM 63.0 - 69.7). The tagged fish typically inhabited near-shore eddy habitat during the spring and early summer, but tended to occupy run/glide or riffle habitat during lower water conditions through the summer. The 2004 monitoring was primarily conducted between March and April, with the fish tending to occur in habitats similar to those utilized during the spring of 2003. Although a number of the November-released fish were located in similar habitat, to where spawning was observed in 2003 and 2004, detailed spawning surveys were not conducted in 2004 to verify whether spawning actually occurred at all of these detection locations.

#### **4.3.3.1 Maple Street to Latah Creek (RM 73.3 - 72.4)**

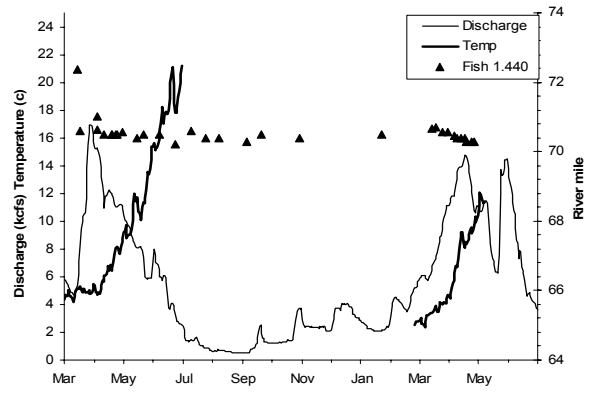
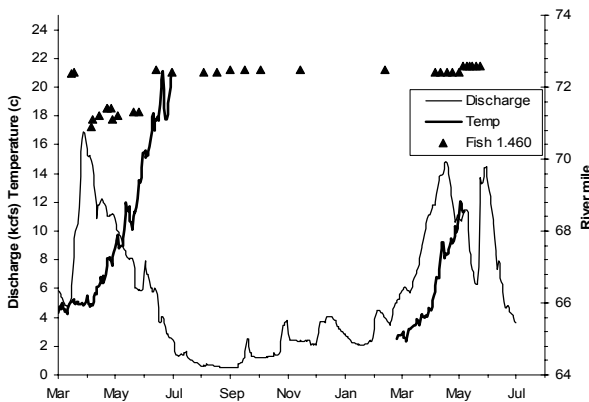
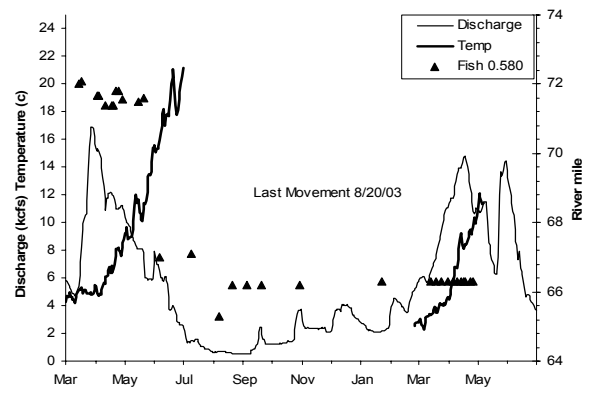
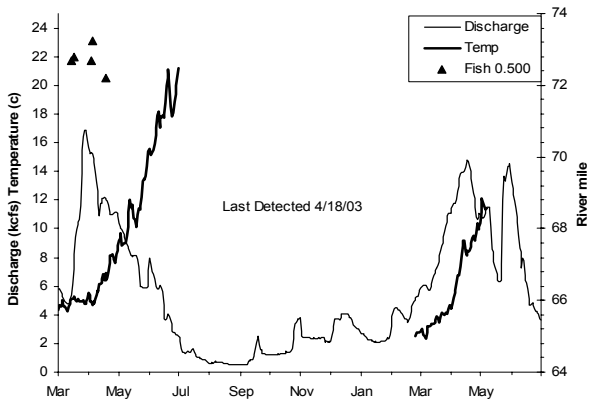
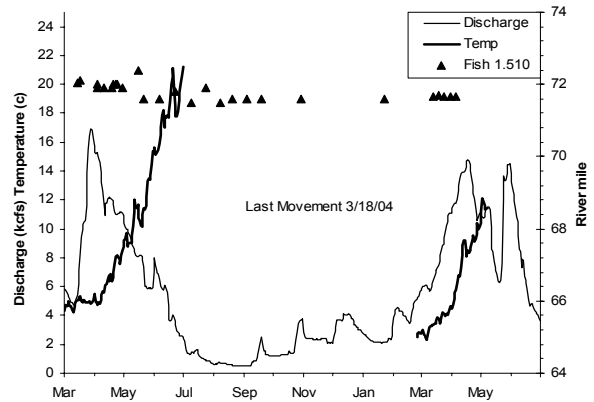
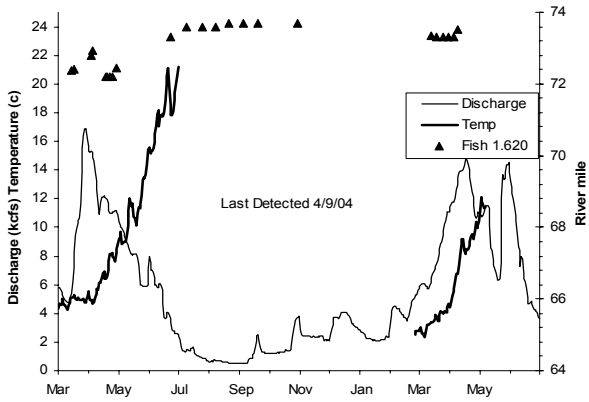
Nine fish were tagged and released in this 2-mile reach on March 14 (see Figure 4). While several fish moved downstream within a week or two of release, others remained near their release points for up to a month before moving downstream (Figure 13). Eventually, all but two (78%) of the fish were downstream of the release location by late summer, or when last detected. During the 2004 spawning season, four of the seven tags detected moved slightly upstream, two slightly downstream, and one showed no substantial movement.

Of the nine fish released in this reach, four (Fish 1.360, 1.440, 1.460 and 1.640) moved at least 1 mile downstream, to the San Soucci area (RM 70.5 – 71.5), soon after release (Figure 13). Three other fish (Fish 0.560, 0.580, and 1.510), moved a substantial distance downstream after April 29. The other two fish released in this reach (Fish 0.500 and 1.620) exhibited somewhat different behavior, moving slightly upstream after release and then downstream of the release location by late April. While Fish 1.620 was the only fish detected in Latah Creek (just upstream of the mouth) during the monitoring period, Fish 0.500 was last detected near the mouth of Latah Creek in April 2003.

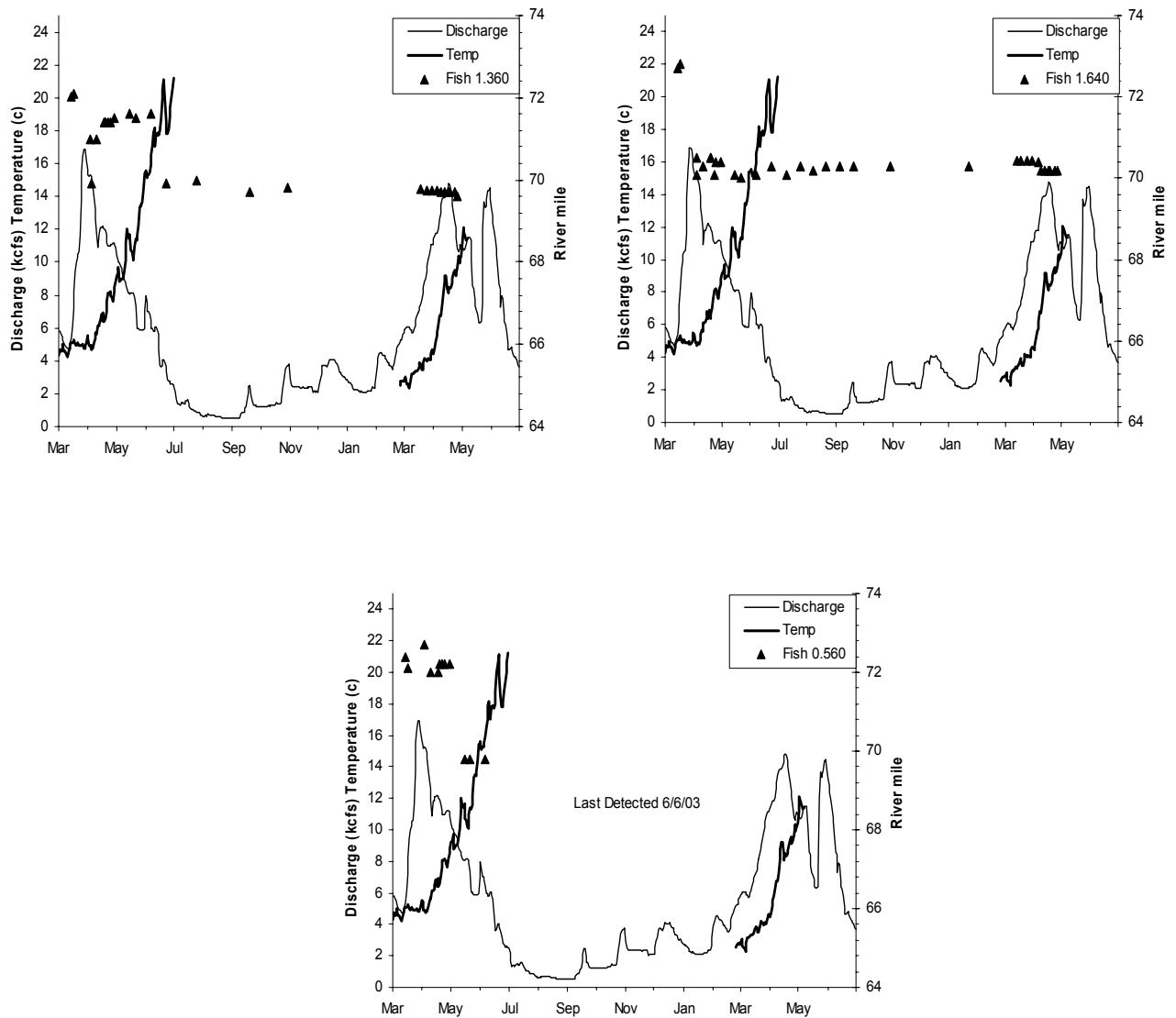
Five of these fish appeared to be active in 2004 (Fish 1.360, 1.440, 1.460, 1.620 and 1.640), although these fish exhibited limited upstream or downstream movement from habitat that they occupied from at least September. While Fish 1.620 was not detected after April 9, the other four fish moved to habitat associated with inundated vegetation during the 2004 spawning season. Prior to the spawning season these fish occupied eddy, run or riffle habitat areas. While at least 1 mile separated the 2003 and 2004 spawning locations of both Fish 1.360 and 1.460, the other two active fish (Fish 1.440 and 1.640) each occurred in the same general locations during both the 2003 and 2004 spawning seasons.

#### **Fish 1.620**

This 423 mm female was the only fish detected in Latah Creek during the monitoring period. Although it was detected in the lower reach of the creek on April 10, it did not pass the monitoring station at the USGS gauge (0.8 miles upstream). It was detected near the mouth of the creek between April 18 and 24, and about 0.2 miles upstream (near the old bridge abutments) on April 29. This fish was also the only fish released in this reach that eventually moved upstream of the release site during the summer, being detected in a cobble/boulder riffle area upstream of the Maple Street put-in (RM 73.6-73.7) between June 23 and September 19. It was detected in the same area between July 9 and August 8, before moving about 0.1 miles upstream, where it was detected through October. It was also detected in this same area in January 2004, but moved about 0.4 miles downstream to near the Maple Street boat access (RM 73.3) by March 13. While it remained in this area until April 9, it was undetected through much of the 2004 spawning period.



**Figure 13**  
**Tracking Locations (River Mile) of Rainbow Trout Released**  
**Between Maple Street and Latah Creek, Along with Water**  
**Temperature (Degree C) and Post Falls HED Discharge (kcfs)**



**Figure 13 (continued)**  
**Tracking Locations (River Mile) of Rainbow Trout Released Between Maple Street and Latah Creek, Along with Water Temperature (Degree C) and Post Falls HED Discharge (kcfs)**

**Fish 1.510**

This 331 mm male rainbow trout stayed within about 0.1 miles of the release site (opposite Latah Creek) through April 29. On May 15 it was located about 0.4 miles upstream of the release site, and then about 0.4 miles downstream of the release site by May 21. It remained in this area, primarily occupying riffle habitat through August 2003, occasionally moving upstream and downstream within a 0.4-mile range (RM 71.5-71.9). This tag was detected in the same general area, riffle habitat in the upper San Soucci area, throughout the remainder of the monitoring period. While there appeared to be some slight

upstream movement in mid-March 2004, no obvious movement was observed through the 2004 spawning season, indicating that the fish had died or expelled its tag.

#### **Fish 0.500**

This 363 mm female remained near the release location (RM 72.7) through April 3, and moved upstream about 0.5 miles by the next day, and then downstream about 1 mile to the mouth of Latah Creek by April 18, but was not detected after that date.

#### **Fish 0.580**

This 386 mm female moved about 0.4 miles downstream after release near Latah Creek (RM 72), to the upper San Soucci area (between RM 71.4 and 71.8), where it remained through May 21. By June 6 however, it moved about 4 miles downstream to near the Spokane sewage treatment plant (RM 67.3), and another mile downstream to just upstream of the Devils Toenail (RM 65.3) by August 7. By August 20, it was located upstream in a pool above the Bowl and Pitcher (RM 66.2), and remained at that location until the end of the monitoring period. The lack of movement indicates that the fish had died or lost its tag.

#### **Fish 1.460**

This 327 mm female was released just upstream of the mouth of Latah Creek (RM 72.4), and moved downstream to the mid-San Soucci area (about RM 71) by April 2, before moving upstream to the upper San Soucci area (RM 71.4) by April 18. About a week later, it was back downstream in the mid-San Soucci area, where it remained through May 21. While in the San Soucci area, this fish was typically detected in eddies downstream of inundated shoreline vegetation, which was typical of habitat used for spawning in the lower river study reach in 2003 (Parametrix 2003). This fish moved back upstream to near the release area, after May 21, and remained upstream of the Latah Creek confluence through the monitoring period. It was detected along the right bank, in boulder and cobble dominated riffle habitat until August 7. Subsequently, it moved across and downstream about 0.1 miles to similar habitat by August 20, where it was detected through January 22. Between March 13, 2004 and the end of the monitoring period, the tag was detected back along the right bank, in an eddy formed by inundated brush.

#### **Fish 1.440**

This 378 mm female was released upstream of the Latah Creek mouth, just downstream of the old bridge abutments (RM 72.4). It moved about 1.8 miles downstream, within a few days of the release, to near an old bridge downstream of San Soucci (RM 70.6). It was detected in this general area through the January survey, primarily in run/glide habitat. Some slight upstream movement occurred in March, 2004, when it was located in eddy habitat, followed by gradual downstream movement through the monitoring period. During April 2004, the tag was detected primarily in habitat associated with inundated brush.

#### **Fish 1.360**

This 343 mm female moved about 2 miles downstream of the release location (RM 72) to the T.J. Meenach Bridge area (RM 69.9) by April 4, before moving back upstream about 1.5 miles to the San Soucci spawning area (RM 71.4) by April 10, where it remained through June 6. On June 23 and July 24 it was located in the T.J. Meenach Springs area ((RM 70.0), but was undetected on July 9, August 20 and September 4. It was next detected on September 19 in riffle habitat near or upstream of the T.J. Meenach Bridge, where it was also detected through January 2004. Between March 13 and April 26, 2004 it was primarily detected in the left bank river channel, just downstream from the bridge in riffle/run habitat. However, after April 13, it was primarily detected in an area associated with inundated brush in this same area.

#### **Fish 1.640**

This 340 mm female was released near the USGS gauge (RM 72.7) on March 14, and moved over 2 miles downstream to the T.J. Meenach springs area (RM 70.1) by April 2. Between April 2 and August 7, it moved back and forth between the T.J. Meenach springs and the old bridge downstream of San Soucci

(about RM 70.5) several times, typically occupying riffle, run and glide habitat. Between August 7 and January, it was primarily located in mid-channel near the old bridge in cobble/boulder riffle habitat. By March 13, it was detected back upstream near the old bridge downstream of San Soucci, in riffle habitat. During April it was detected downstream of the bridge, in inundated vegetation habitat (RM 70.2).

#### **Fish 0.560**

This 382 mm female was tagged and released at the old bridge crossing upstream of the Latah Creek mouth (RM 72.4). Within a few days, it moved downstream to near the mouth of Latah Creek, where it remained throughout April. By May 15, it moved downstream to the T.J. Meenach springs area, and remained in that area through June 6, but was undetected from June 23 through April 2004.

#### **4.3.3.2 Latah Creek to T.J. Meenach Bridge (RM 72.2 - 69.7)**

Eight rainbow trout were tagged and released in this reach on March 14 (see Figure 4). Three of these fish (Fish 1.320, 1.420, and 1.520) were released in the upper San Soucci area (RM 71.3), three (Fish 1.380, 0.600, and 1.500) in the lower San Soucci area (RM 70.6), and two (Fish 1.000 and 1.400) at the T.J. Meenach springs area (RM 69.9).

#### **Upper San Soucci area (RM 71.3)**

The three fish released in the San Soucci area eventually moved at least 3 miles downstream of the release location, although they exhibited different behavior patterns prior to the move (Figure 14). Two of these fish (Fish 1.320 and 1.520) occurred in different locations during the 2003 spawning season than they were located in 2004 (each at least 3 miles downstream from their 2003 locations). However, the tag from Fish 1.420 was recovered in October.

#### **Fish 1.520**

Although this 382 mm female initially moved downstream after release, by April 4 it was located about 0.1 miles upstream of the release site (RM 71.4). It remained in the upper San Soucci area for about a month, before moving about 2 miles upstream to near the Monroe Street HED tailrace area (RM 73.5) by April 29. After being detected downstream of Monroe Street HED on May 15 and 21, it was not detected for over a month, before being detected about 6 miles downstream (in cobble dominated run habitat) near the Spokane sewage treatment plant between (RM 67.3) July 24 and September 4. On September 19, it was detected in a riffle area about another 2.6 miles further downstream, near the Spokane Rifle Club (RM 64.7), and was detected primarily in run/riffle habitat in this area through March 30 2004. It gradually moved downstream during early April, and occurred in eddy habitat at RM 64.1 between April 16 and 26.

#### **Fish 1.320**

This 360 mm female moved about 0.3 miles downstream to the mid-San Soucci area by April 2, and occupied eddy habitat (typically associated with inundated vegetation) through May 15. This habitat was typical of spawning areas used by rainbow trout in the lower river study reach in 2003 (Parametrix 2003). This fish was detected about 0.5 miles downstream on May 21, and about 2.5 miles further downstream in the Riverbend Bar area (about RM 68.2) on June 6. It was detected in this general area through April 2004, occasionally moving up and downstream within a 0.4-mile range. The detections were also primarily in riffle habitat through January 2004, run/riffle habitat through April 5, and glide habitat through April 26. On April 5 and 19 however, it was detected in habitat associated with inundated vegetation.

#### **Fish 1.420**

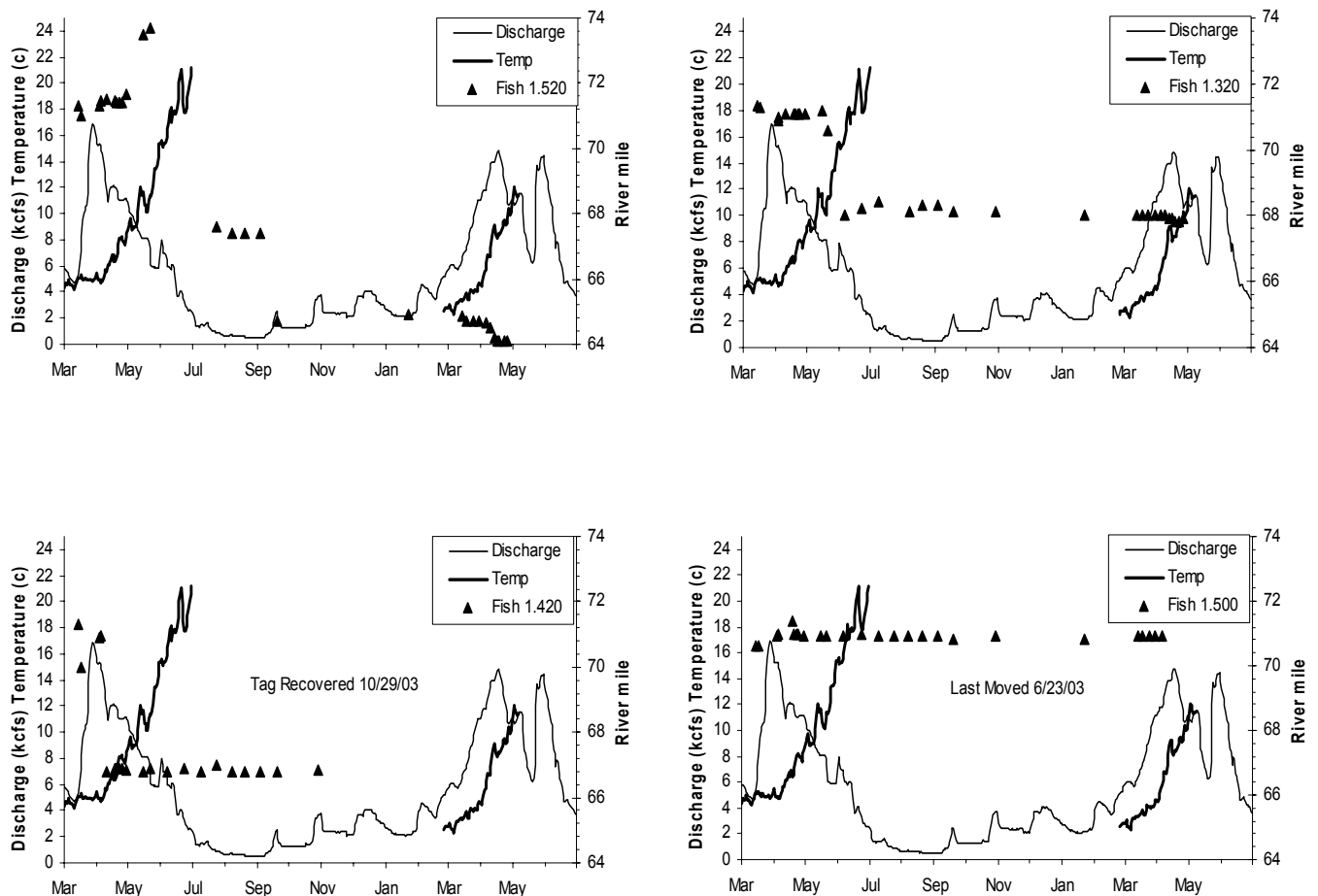
This 375 mm female moved about 1.3 miles downstream after release, and was detected near the T.J. Meenach Bridge (RM 70.0), but moved back upstream about 1 mile (to the mid-San Soucci area) by April 2. By April 10 however, it moved about 4 miles downstream (near the Spokane sewage treatment plant),



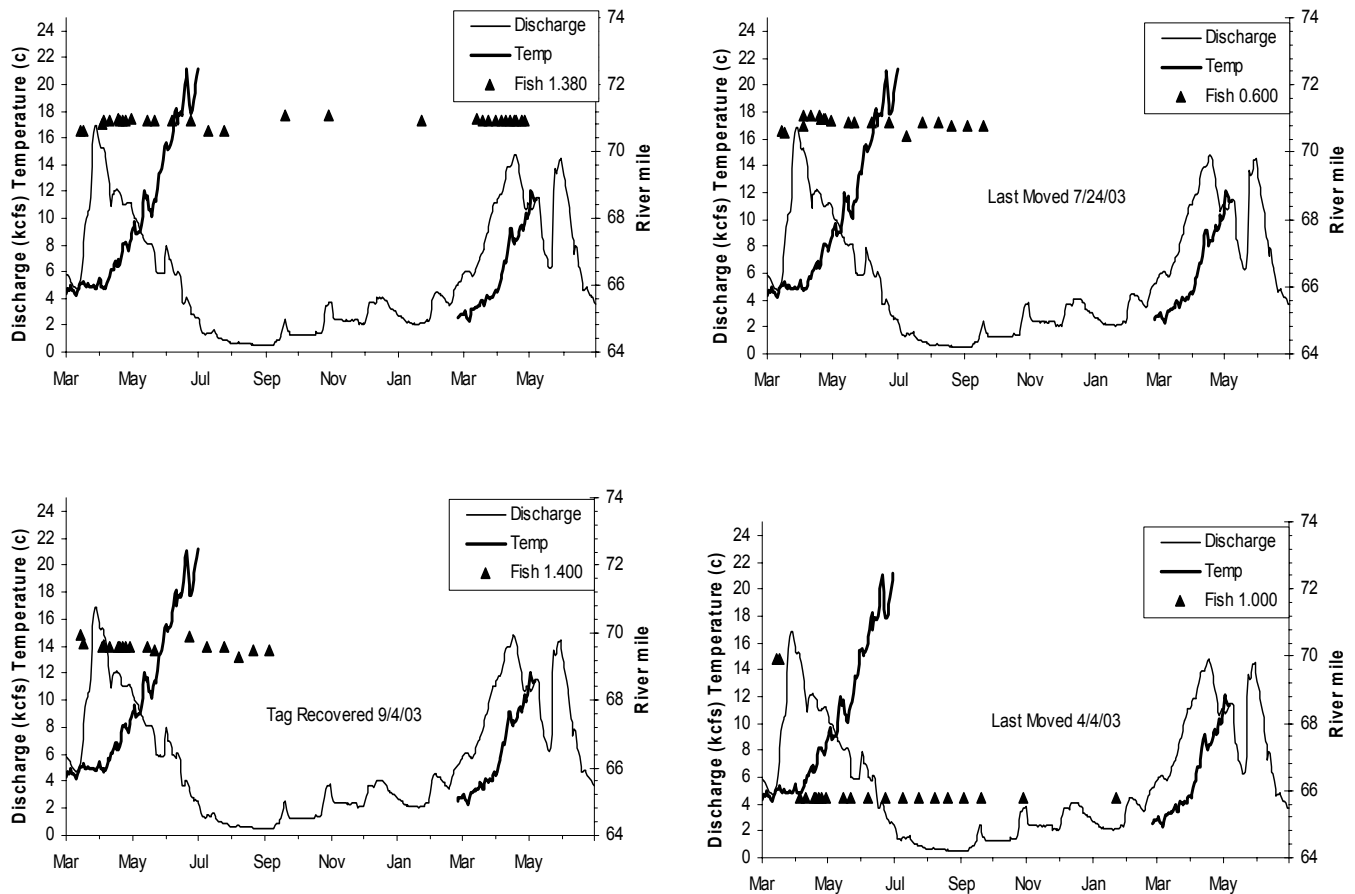
where it remained through September 19 (primarily occurring in cobble/boulder riffle habitat). However, this tag was recovered in this area (up on the river bank adjacent to a hiking trail) on October 29.

### Lower San Soucci (RM 70.6)

In contrast to the observed behavior of the fish released in the upper San Soucci area, all three of the fish released in the lower San Soucci area moved upstream to the upper or mid-San Soucci area in early April. All three of these fish also remained in the San Soucci area throughout the monitoring period, although one tag (Fish 0.600) was located on shore in September, and the lack of movement of one other tag (Fish 1.500) indicates that it either died or expelled its tag (see Figure 14). The third fish occurred within about a 0.5 mile range throughout the monitoring period, it occupied inundated brush habitat in this area during both spawning seasons.



**Figure 14**  
**Tracking Locations (River Mile) of Rainbow Trout Released**  
**Between Latah Creek and T.J. Meenach Bridge, Along with Water**  
**Temperature (Degree C) and Post Falls HED Discharge (kcfs)**



**Figure 14 (continued)**  
**Tracking Locations (River Mile) of Rainbow Trout Released**  
**Between Latah Creek and T.J. Meenach Bridge, Along with**  
**Water Temperature (Degree C) and Post Falls HED**  
**Discharge (kcfs)**

#### **Fish 1.500**

This 326 mm female moved upstream of the release site (RM 70.6), to the mid-San Soucci area (RM 71), by April 2, and remained in this area throughout the monitoring period. However, the fish is assumed to have died or lost its tag at some point, because of the lack of obvious movements after June 6, 2003. Initially it was located in shoreline eddy habitat, although later in the summer it tended to occupy boulder and cobble dominated run/glide habitat.

#### **Fish 1.380**

This 364 mm male also moved upstream (about 0.3 miles) after release, and remained in this area through June 23, occupying primarily eddy habitat. On July 9 and 24 it was located in riffle habitat downstream near the release location (RM 70.6). While it was not detected in the lower river for about 2 months, it was located in glide habitat in the mid-San Soucci area (RM 71.1) on September 19, and remained in this general area through the monitoring period. Despite the limited movement of this fish, it was detected in an area of inundated brush during the 2004 spawning season, which is typical spawning habitat in the

lower river study reach. A pair of potentially fish was observed spawning or staging in this area on April 9.

#### **Fish 0.600**

This 365 mm female moved about 0.5 miles upstream to the upper San Soucci area (RM 71.1) by April 4. In this area, it was primarily located in eddy habitat associated with inundated vegetation, through April 24. After April 24, this fish moved downstream to the mid-San Soucci area, where it remained through September 4. However, the tag was detected in what appeared to be a river otter den in this area on September 19. While in the mid-San Soucci area, it was primarily located in cobble and boulder dominated run/glide habitat.

#### **4.3.3.3 Downstream of T. J. Meenach Springs (RM 69.9)**

Two fish (Fish 1.000 and 1.400) were tagged and released downstream of the T.J. Meenach Springs area on March 14, 2003, at RM 69.9. One 342 mm female (Fish 1.000) moved about 4 miles downstream of the release location, to the large eddy downstream of the Bowl and Pitcher (RM 65.8) by April 4 (see Figure 14). It remained in this area throughout the monitoring period. However, because it has occupied the same pool throughout this period, and attempts to disturb the fish into moving were unsuccessful, we assume that this fish had died, or shed the tag. The other fish (a 323 mm male) only moved about 0.3 miles downstream of the release location, to just downstream of the T.J. Meenach Bridge (RM 69.6). It was detected in this general area throughout the monitoring period. However, the tag was found on the riverbed in this area on September 4.

#### **T.J. Meenach Bridge to Plese Flats (RM 69.7 – 63.0)**

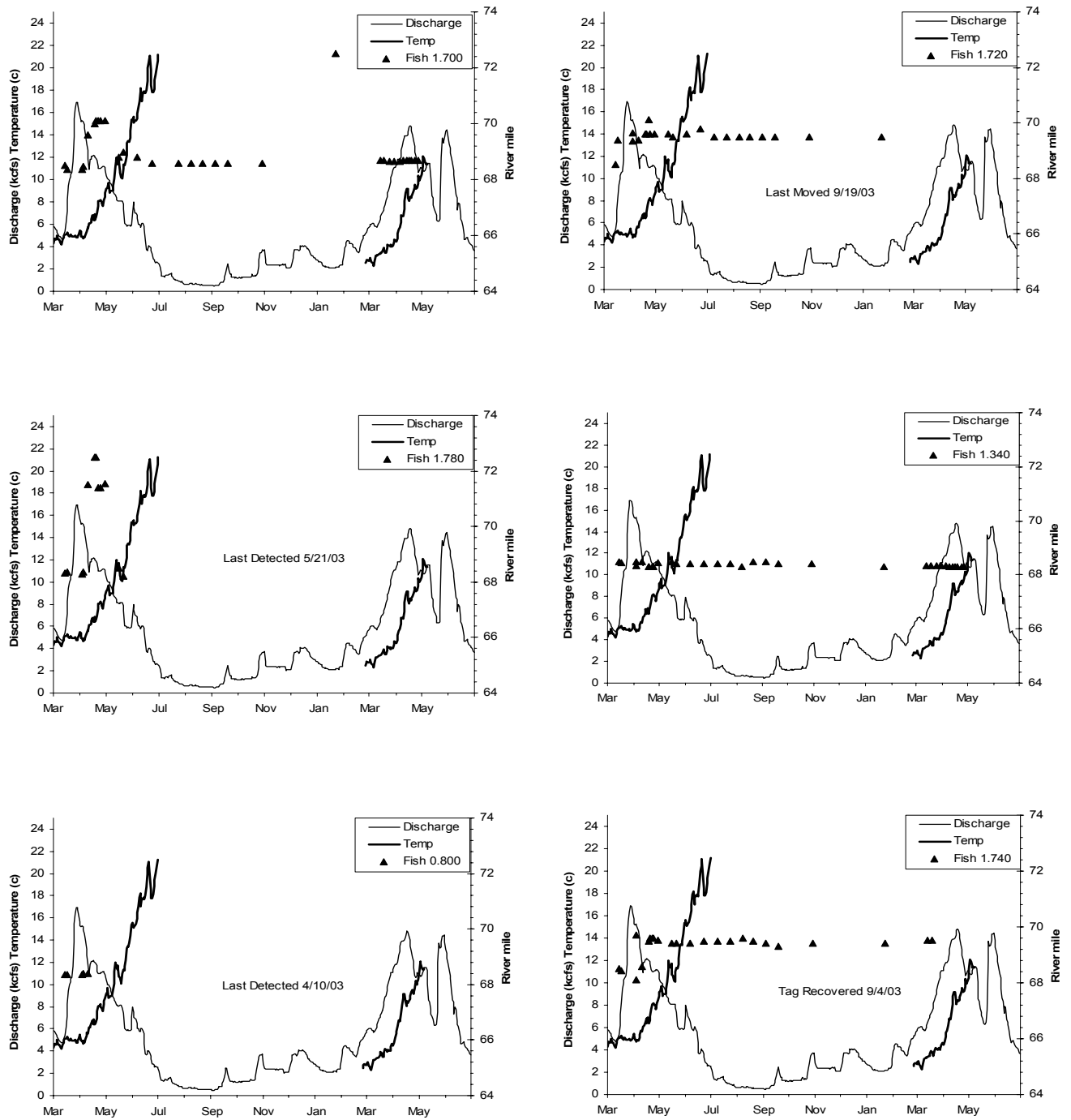
A total of 12 fish were tagged and released in this reach on March 15, 2003 (see Figure 4). Six of these fish were released at the Riverbend Bar area (RM 68.5), two near the Spokane sewage treatment plant (RM 67.3), and four in the large eddy downstream of the Bowl and Pitcher (RM 65.7).

#### **Riverbend Bar (RM 68.3-68.5)**

Of the six fish released at the Riverbend Bar area, four moved at least 1 mile upstream within several weeks of tagging (by April 10), while the other two were only detected near the release locations (Figure 15). Three of the fish that moved upstream were detected in the T.J. Meenach springs area (RM 70.2), where two remained throughout the monitoring period, and the other moved back to near the release site after the 2003 spawning season. The fourth fish moved upstream past Latah Creek, and then downstream about a mile to the upper San Soucci area (RM 71.4), before returning to near the release site after the 2003 spawning season. Two of these tags were not detected after June 2003, and two others were determined to be up on shore by March 2004, although the tags were not recovered. Of the two remaining fish, one (Fish 1.340) occurred in the same habitat during both the 2003 and 2004 spawning seasons, while Fish 1.700 was located about 1.3 miles downstream of its 2003 location in 2004

#### **Fish 1.700**

This 359 mm female was tagged and released at the upper end of the large eddy, upstream of Riverbend Bar (RM 68.5) on March 15. Three days later it was located about 0.1 miles downstream, in a side channel adjacent to the island gravel bar, where it was detected until April 4. By April 10 it was located about 1.2 miles upstream, just downstream of the T.J. Meenach Bridge. The following week it was detected in the T.J. Meenach springs area, a confirmed spawning area in 2003 (Parametrix 2003), where it was detected through April 29. Between May 15 and June 6, it was detected about 0.5 miles downstream of T.J. Meenach Bridge, and by June 23 it was found in riffle habitat upstream of Riverbend Bar (RM 68.6). It remained within about 0.1 miles of this location throughout the remainder of the monitoring period, although it moved from riffle/run habitat to an area of inundated brush during the 2004 spawning season.



**Figure 15**  
**Tracking Locations (River Mile) of Rainbow Trout Released Between Riverbend Bar and the Spokane Sewage Treatment Plant, Along with Water Temperature (Degree C) and Post Falls HED Discharge (kcfs), 2003**

### **Fish 1.720**

This 361 mm female was tagged and released at the same location as Fish 1.700, in the eddy upstream of Riverbend Bar. Three days later it was located about 1 mile upstream, to just downstream of the T.J. Meenach Bridge (RM 69.4). It remained within 0.3 miles of the release location (primarily in cobble substrate run/glide habitat) throughout the monitoring period, except for one detection on April 22, near the T.J. Meenach springs. The last observed movement of this fish occurred between June and July 2003, and the tag was determined to be up on shore (but not recovered) on March 13, 2004.

### **Fish 1.780**

This 347 mm female was tagged and released in the Riverbend Bar side channel (RM 68.4). It was detected in this area through April 4, before moving upstream of Latah Creek (RM 72.5) by April 18. It was located between this location and the upper San Soucci area (RM 71.4) through April 29. By May 15 this fish was detected back near the release point, although it was last detected in this area on May 21.

### **Fish 1.340**

This 350 mm male was released at the upper end of the Riverbend Bar eddy, and remained near Riverbend Bar (a known spawning area) throughout the monitoring period. During this time, it was detected primarily eddy/pool habitat, although it was located among inundated brush during the 2004 spawning season. Overall, this fish remained within 0.2 miles of the release location throughout the monitoring period.

### **Fish 0.800**

This 318 mm male remained in the Riverbend Bar side channel through April 10, when it was last detected in the reach. However, this fish was detected by the fixed monitoring station, at Nine Mile HED, between April 19 and 23. Although this fish was not detected again after April 23, we were not able to determine if it passed downstream of the dam.

### **Fish 1.740**

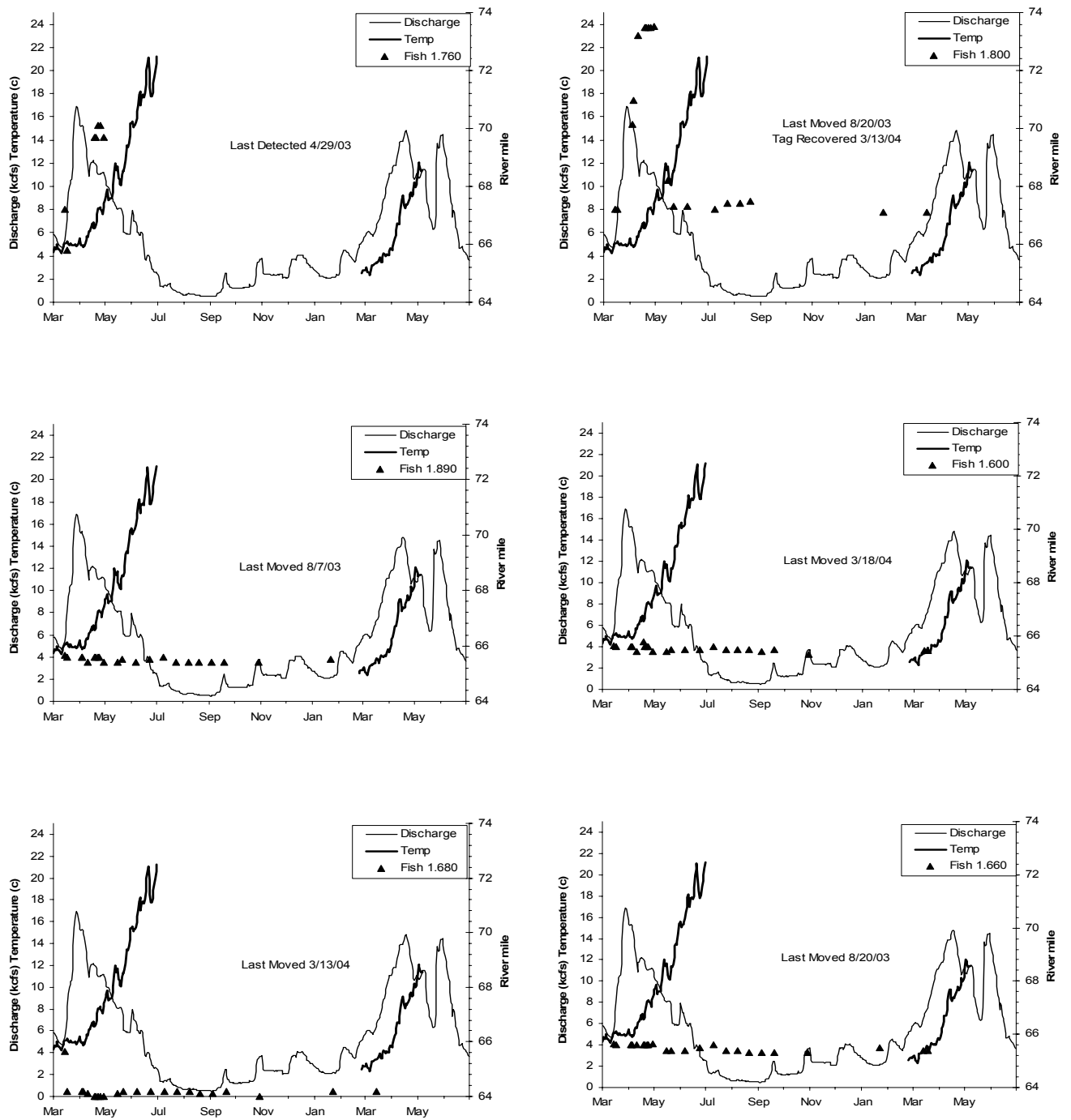
This 334 mm female was released along with Fish 1.700 and 1.720. After being detected on April 4 downstream of the release site, this fish moved upstream about 1.4 miles, to a point just downstream of the T.J. Meenach Bridge (similar to Fish 1.720). Also like Fish 1.720, this fish was detected in this general area throughout the monitoring period, primarily occupying cobble and boulder dominated riffle/run habitat. The last observed movement of this fish occurred between August and September 2003, and the tag was determined to be up on shore (but not recovered) by March 13, 2004.

#### **4.3.3.4 Sewage Treatment Plant (RM 67.3)**

Two fish (Fish 1.760 and 1.800) were tagged and released along the left bank, across the river from the Spokane sewage treatment plant on March 15. Both of these fish moved upstream of the release location, and were detected in known spawning areas during the 2003 spawning period (Figure 16). One returned to near the release point after the 2003 spawning period, while the other remained upstream.

#### **4.3.3.5 Spokane Sewage Treatment Plant to Plese Flats (RM 67.2 - 63.0)**

Four fish were released in this reach, in the large eddy downstream of the Bowl and Pitcher (RM 65.7). Three of these fish remained between the release location and the Devils Toenail (RM 65.1) throughout the monitoring period (see Figure 16). The fourth fish (Fish 1.680) moved about 1.5 miles downstream, to near the Spokane Rifle Club, soon after release.



**Figure 16**  
**Tracking Locations (River Mile) of Rainbow Trout Released Between the**  
**Spokane Sewage Treatment Plant and Plese Flats, Along with Water**  
**Temperature (Degree C) and Post Falls HED Discharge (kcfs), 2003**

### **Fish 1.600**

This 330 mm male was detected primarily in eddy habitat along the right bank between RM 65.4 and 65.6 during the spring and early summer. Between July 9 and September 19 however, it was typically detected in cobble/boulder dominated riffle/run habitat about 0.2 miles downstream of the release location (RM 65.5). It was detected within a 0.2-mile area between September and March, although no obvious movements were detected after March 18. Thus, the fish is assumed to have died or lost its tag.

### **Fish 1.660**

Similar to fish 1.600, this 330 mm male was detected primarily in eddy habitat along the left and right banks through mid-April. However, it was detected in cobble/boulder dominated riffle/run habitat between April 22 and September 19, between 0.2 and 0.4 miles downstream of the release site. However, the lack of subsequent movements throughout much of the monitoring period indicates that this fish died or expelled its tag

### **Fish 1.890**

Similar to fish 1.600 and 1.660, this 357 mm male was detected primarily in eddy habitat along the right bank between RM 65.4 and 65.6 during the spring and early summer. However, between July 24 and September 19 it typically occupied boulder and cobble dominated riffle/run habitat about 0.2 miles downstream of the release location. This fish was detected in the same area after July 24, exhibiting no apparent movement, and is assumed to have died or lost its tag.

### **Fish 1.680**

This was the only fish released in this reach that moved a substantial distance (1.5 miles) downstream, soon after release. This 368 mm male was located just downstream of the Spokane Rifle Club (RM 64) on April 2, and remained in cobble and boulder dominated riffle/glide habitat in this area throughout the monitoring period. However, no obvious movements have been observed of this fish since about April 2003, so the fish is assumed to have died or lost its tag.

## **4.3.4 Lower River Study Reach (November 2003 Fish Releases)**

Fish were tagged and released in two general release areas, in the lower river study reach, in November 2003. These two general areas were between Maple Street and Latah Creek (RM 73.2- 72.3), and between Latah Creek and T.J. Meenach Bridge (RM 72.3 - 69.7).

### **4.3.4.1 Maple Street to Latah Creek (RM 72.2 – 73.2)**

Seven fish were tagged and released in this 1-mile reach on November 18 (see Figure 4), with three released just downstream of the Maple Street put-in site (RM 73.1) and four released slightly upstream and opposite of Latah Creek (RM 72.3) (Figure 17). While only two fish moved downstream between November and January, two additional fish moved slightly downstream between January and the end of April. The other three fish moved slightly upstream from the release location, before or during the 2004 spawning season. All of these fish occupied known or suspected spawning habitat during the spawning season.

### **Fish 0.180**

This 400 mm rainbow trout was released about 0.1 miles downstream of the Maple Street boat put-in site (RM 73.1) on November 18 (see Figure 17). The tag was detected in this same area through March 24, but upstream of the put-in site on March 30 (at RM 73.5). It was located 0.6 to 0.7 miles downstream through mid-April, and opposite the mouth of Latah Creek (RM 72.3) by April 23. All of the detections in April were in habitat associated with inundated vegetation that are known or suspected spawning areas.

**Fish 0.320**

This 356 mm rainbow trout was tagged and released about 0.1 miles downstream of the Maple Street put-in site on November 18. The tag was detected within about 0.1 miles of the release site throughout the monitoring period, including a known spawning area during the spawning season. This spawning habitat was typical of the habitat utilized by rainbow trout in the lower river study reach, primarily associated with inundated riparian vegetation.

**Fish 1.670**

This 418 mm rainbow trout was tagged and released along with Fish 0.180 and 0.320 on November 18, and detected within 0.1 miles of the release location through the monitoring period. As with Fish 0.320, this tag was detected in known spawning areas (areas of inundated vegetation) during the spawning season.

**Fish 0.570**

This 349 mm rainbow trout was released just upstream of Latah Creek (RM 72.33) on November 18. The tag was detected about 3.9 miles downstream, near the Riverbend Bar spawning area on January 22, 2004. While it was undetected in March, it was detected in the Riverbend Bar area through most of April.

**Fish 0.620**

This 367 mm rainbow trout was released, along with Fish 0.570, on November 18, 2003. The tag was detected within 0.2 miles of the release location through April 9, 2004. However, it was detected about 0.8 miles upstream on April 13, in a known spawning area just upstream of the Maple Street put-in site (RM 73.3). Three days later it was back downstream to near the release location, where it remained through the remainder of the monitoring period.

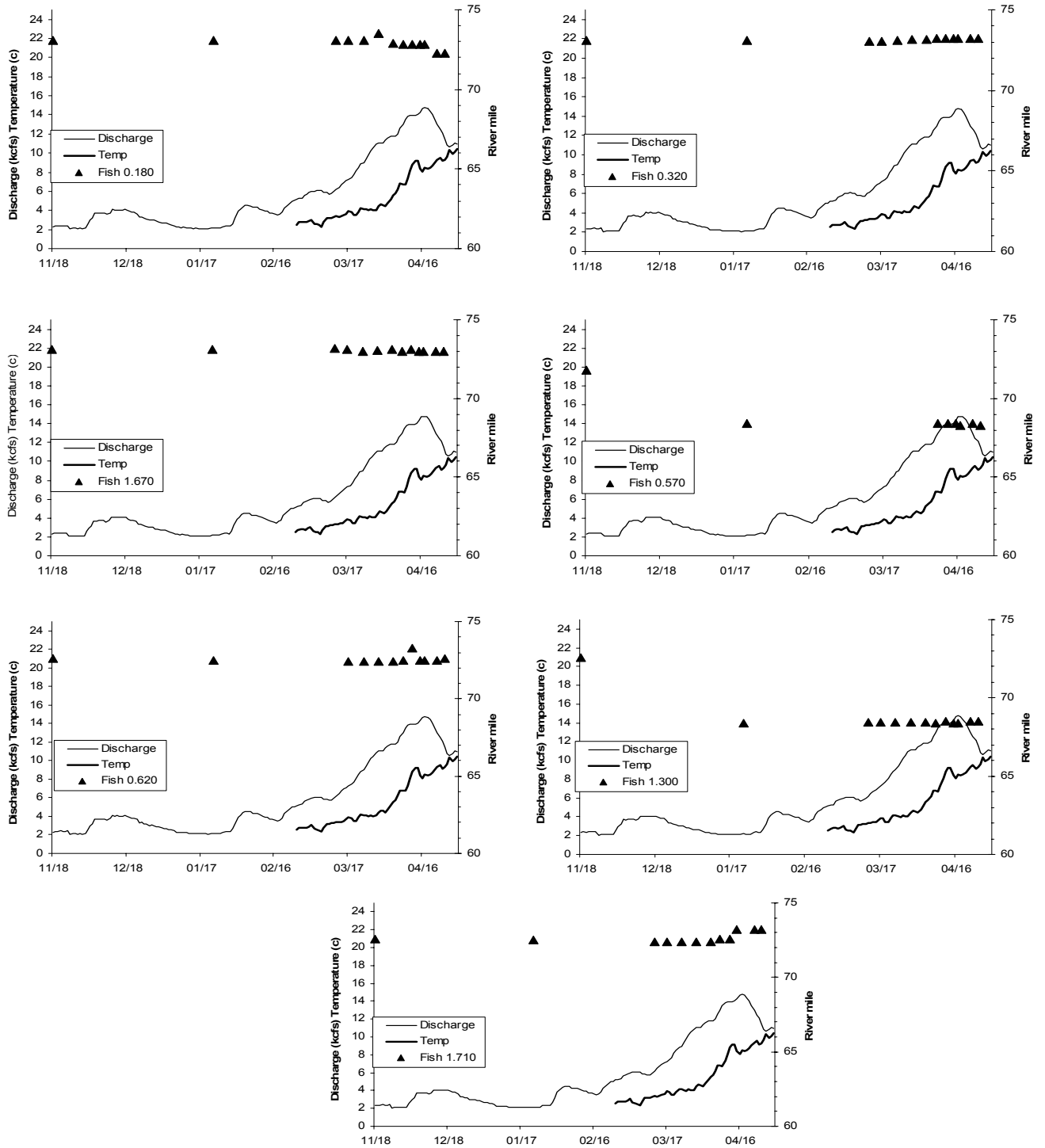
**Fish 1.300**

This 319 mm rainbow trout was released, along with Fish 0.570 and 0.620, on November 18, 2003. This tag was detected about 3.9 miles downstream, at the Riverbend Bar spawning area (RM 68.4) by January 22. It was detected in this area through the 2004 spawning season, although this fish was not observed actively spawning.

**Fish 1.710**

This 347 mm rainbow trout was released, along with Fish 0.570 0.620, and 1300 on November 18, 2003. This tag was detected within about 0.2 miles of the release location through April 5, but about 0.9 miles upstream from mid- to late April. The latter location is a known spawning area, just downstream of the Maple Street put-in location. While spawning was observed in this area in 2004, this fish was not observed actively spawning.





**Figure 17**  
**Tracking Locations (River Mile) of Rainbow Trout Released Between**  
**Maple Street and Latah Creek, Along with Water Temperature (Degree C)**  
**and Post Falls HED Discharge (kcfs)**

#### **4.3.4.2 Latah Creek to T.J. Meenach Bridge (RM 72.4 - 69.6)**

Six fish were tagged and released in this 3-mile reach on November 18 (see Figure 4), with four released in the lower San Soucci area (RM 70.7), and two just downstream of T.J. Meenach Bridge (RM 69.6) (Figure 18). Four of the six fish moved between 0.5 and 2.6 miles downstream, between the release date and January 2004. The other two fish moved between 0.3 and 1.1 miles upstream during this same period. Four of these tags were detected near known or suspected spawning areas during the spawning season.

##### **Fish 0.490**

This 384 mm rainbow trout was released on November 18, at the river bend downstream of Latah Creek (RM 71.8). This tag was detected about 1 mile downstream to the San Soucci river bend on January 22, and about 0.3 miles upstream throughout the remainder of the monitoring period. During much of April, the tag was detected in an area of inundated riparian vegetation, where spawning was observed in 2004.

##### **Fish 0.550**

This 335 mm rainbow trout was released on November 18, at the lower San Soucci river bend (RM 70.7). This tag was detected about 2.2 miles downstream of the release location on January 22, before moving about 3 mile upstream by March 13, and finally about 2.9 miles downstream of the release location during the month of April. During much of April, the tag was detected in riffle/glides habitat upstream of the sewage treatment plant (at about RM 67.8).

##### **Fish 1.480**

This 315 mm rainbow trout was released on November 18, at the boat access site just downstream of T.J. Meenach Bridge (RM 69.6). This tag was detected about 2.6 miles downstream of the release location on January 22, and about another mile further downstream by March 13, and remained in this area through April. During much of April, the tag was detected in eddy habitat just upstream of the Bowl and Pitcher (RM 66.2).

##### **Fish 1.570**

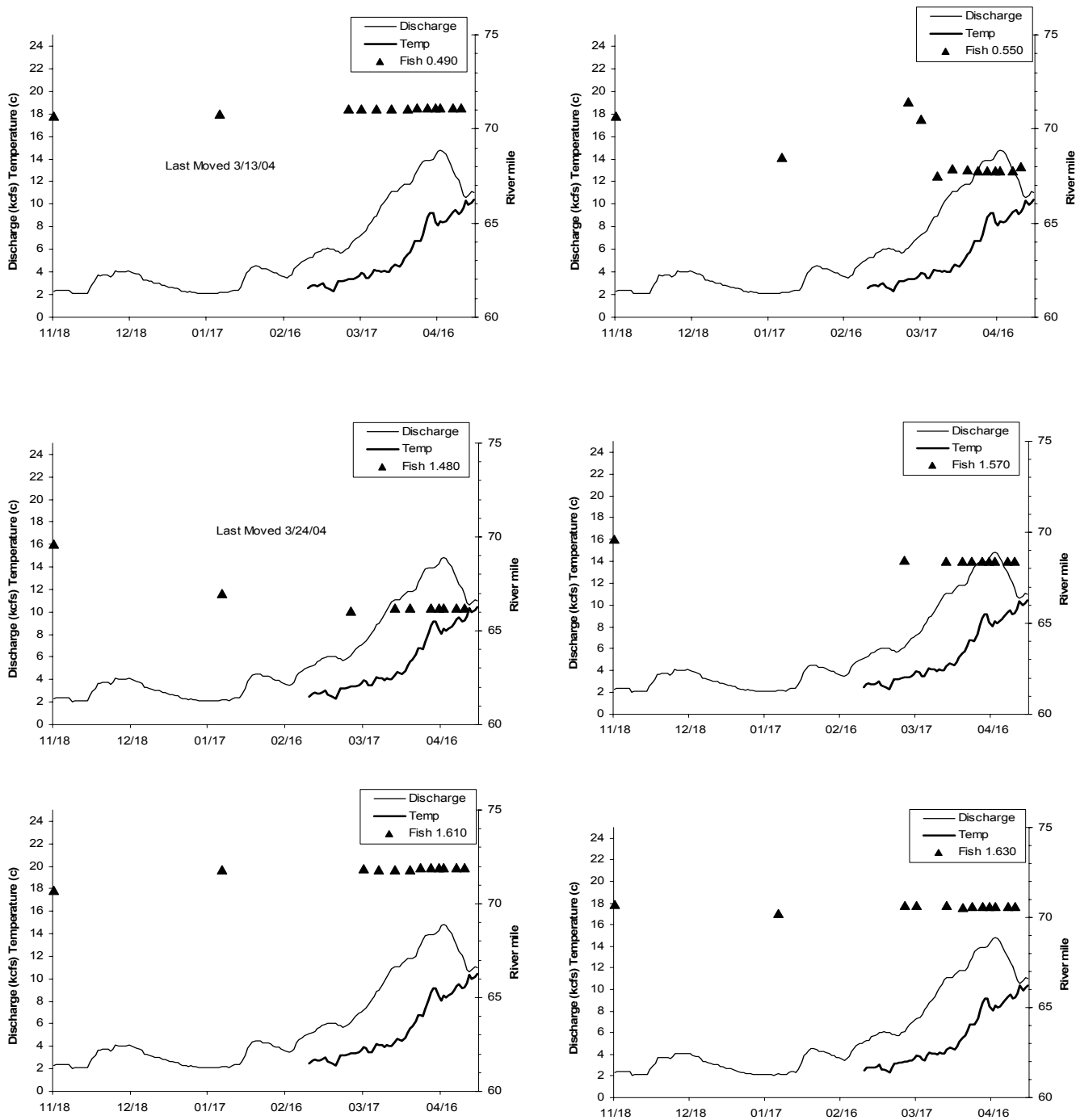
This 317 mm rainbow trout was released on November 18, at the boat access site just downstream of the T.J. Meenach Bridge (RM 69.6). This tag was detected about 1.2 miles downstream of the release location on January 22, and remained in this area through the monitoring period. During much of April, the tag was detected in glide or pool habitat in the Riverbend Bar area (RM 68.4), a known rainbow trout spawning area.

##### **Fish 1.610**

This 374 mm rainbow trout was released on November 18, at the lower San Soucci river bend (RM 70.7). This tag was detected about 1.1 miles upstream of the release location on January 22, at the river bend downstream of Latah Creek (RM 71.8). It was detected in this area throughout the remainder of the monitoring period. During much of April, the tag was detected in habitat associated with inundated riparian vegetation, although no spawning was observed in this area in 2003 or 2004.

##### **Fish 1.630**

This 374 mm rainbow trout was released on November 18, at the lower San Soucci river bend (RM 70.7). This tag was detected about 0.5 miles downstream of the release location on January 22, and between RM 70.2 and 70.65 throughout the remainder of the monitoring period. During much of April, the tag was detected in eddy habitat in the lower San Soucci area, typically associated with inundated riparian vegetation, where spawning was observed in 2003.



**Figure 18**  
**Tracking Locations (River Mile) of Rainbow Trout Released Between**  
**Latah Creek and T.J. Meenach Bridge, Along with Water Temperature**  
**(Degree C) and Post Falls HED Discharge (kcfs)**

## **4.4 SPAWNING LOCATIONS**

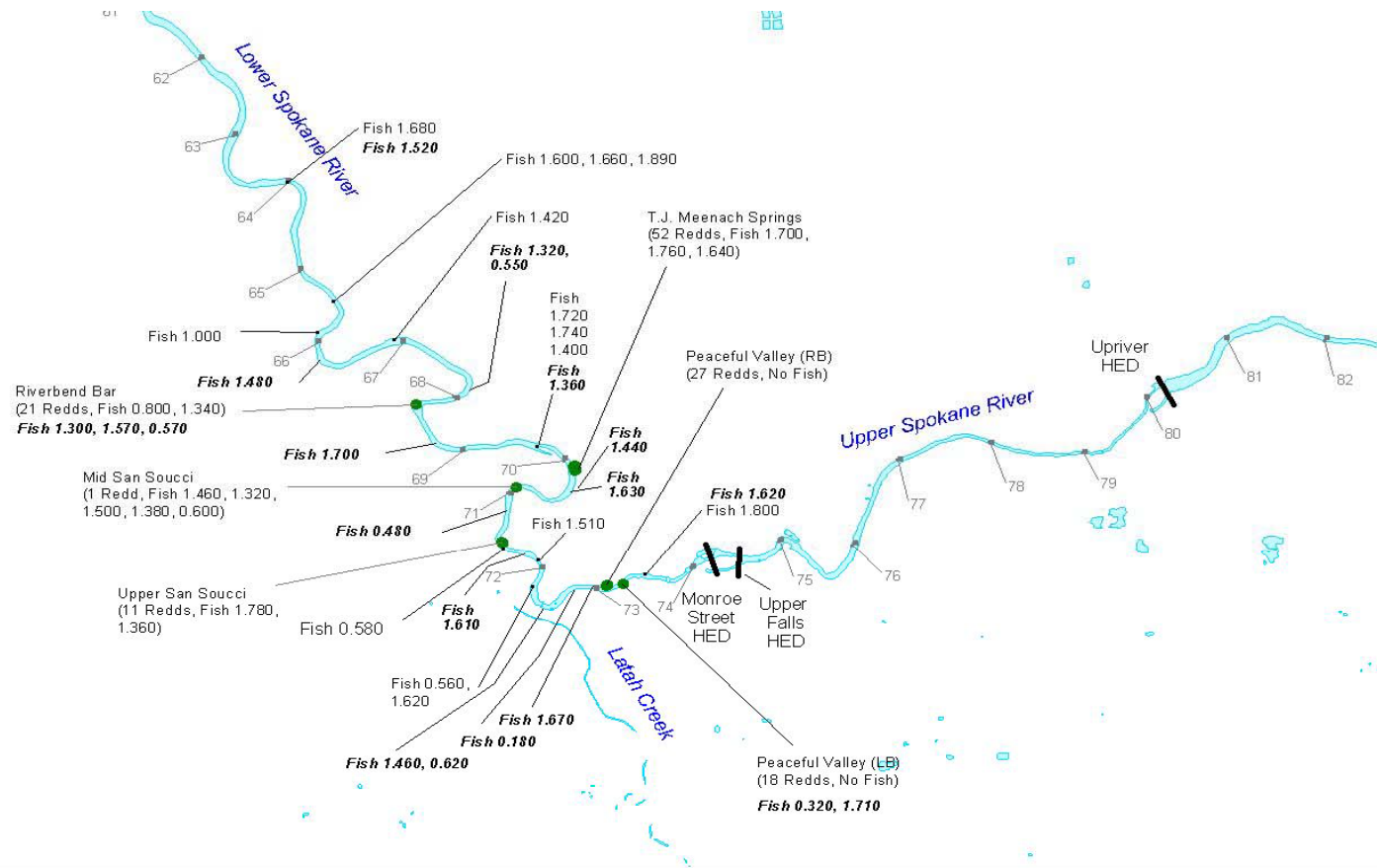
Radio tracking efforts during the 2003 and 2004 spawning seasons helped locate potential spawning, or pre-spawning staging areas, warranting further investigation as part of this overall evaluation. Tagged fish were detected in virtually all of the previously identified spawning areas in 2003 (Parametrix 2003), with the exception of the Idaho sites at Corbin Park and McGuire Road, and the Peaceful Valley area downstream of Monroe Street HED in Washington (Figures 19 and 20). The limited number of fish detected in the Idaho spawning areas is likely the result of only three tagged fish being released in Idaho in March 2003. About half of the radio-tagged fish were located in known spawning areas, while the rest were detected in other areas during the 2003 spawning period.

Eight of the fourteen fish released in Idaho in November were detected in Washington during all or most of the 2004 spawning season. Two others were also detected in Washington in April, but only on one occasion each. Of the tagged fish detected in Washington, seven were in known spawning areas, and one was near Flora Rapids, the same location as another radio-tagged fish during the 2003 spawning season. Although spawning has not been documented in this area, small areas of suitable spawning substrate were observed during low flow conditions in 2003. The other fish that moved downstream to Washington in 2004 was located about 10 miles downstream of the Idaho/Washington state line, near the Trent Street Bridge where no spawning was observed in 2003 or 2004. The other November-tagged fish were only detected in Idaho through June, but no spawning was observed at any of these detection locations.

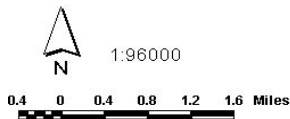
### **4.4.1 Upper River Study Reach (March 2003 Fish Releases)**

Eleven of the 31 upper river fish released in March 2003 moved greater than 0.5 miles downstream from their release location prior to or during the 2003 spawning period. Nine of these fish were released upstream of Harvard Road. Other fish in the upper river reach tended to remain close to the release locations during the spawning period, occasionally moving upstream and downstream within a small range. During the 2003 spawning period, 16 of the 31 upper river study reach fish were located in areas where redds were also observed (Table 6). No suitable spawning habitat, signs of spawning activity, or emergent fry were observed in areas occupied by the other fish during the 2003 spawning season. For example, five fish were located near the Mirabeau Point area, three just upstream of Barker Road, and one fish in each of the areas upstream of Sullivan Road and downstream of Pines Road. No spawning activity was observed in these areas, but the water was typically too deep to adequately observe either the substrate characteristics or spawning fish during the spawning period. Subsequent observations during low flow conditions revealed a relatively large gravel bar upstream of Barker Road, and pockets of gravel in other areas that were potentially suitable for spawning. By the time the flow conditions were suitable for observations in late May, there was no evidence of spawning or newly emergent fry in these areas.

Two other areas, where five fish were holding during the spawning period (Simpson Bar and the island downstream of the USGS gauge), contained suitable spawning habitat (see Table 6). These areas were thoroughly examined on foot during the spawning season, and during subsequent low flow conditions, but no evidence of spawning activity was observed. In addition, no fry were observed in these areas at the expected time of emergence.

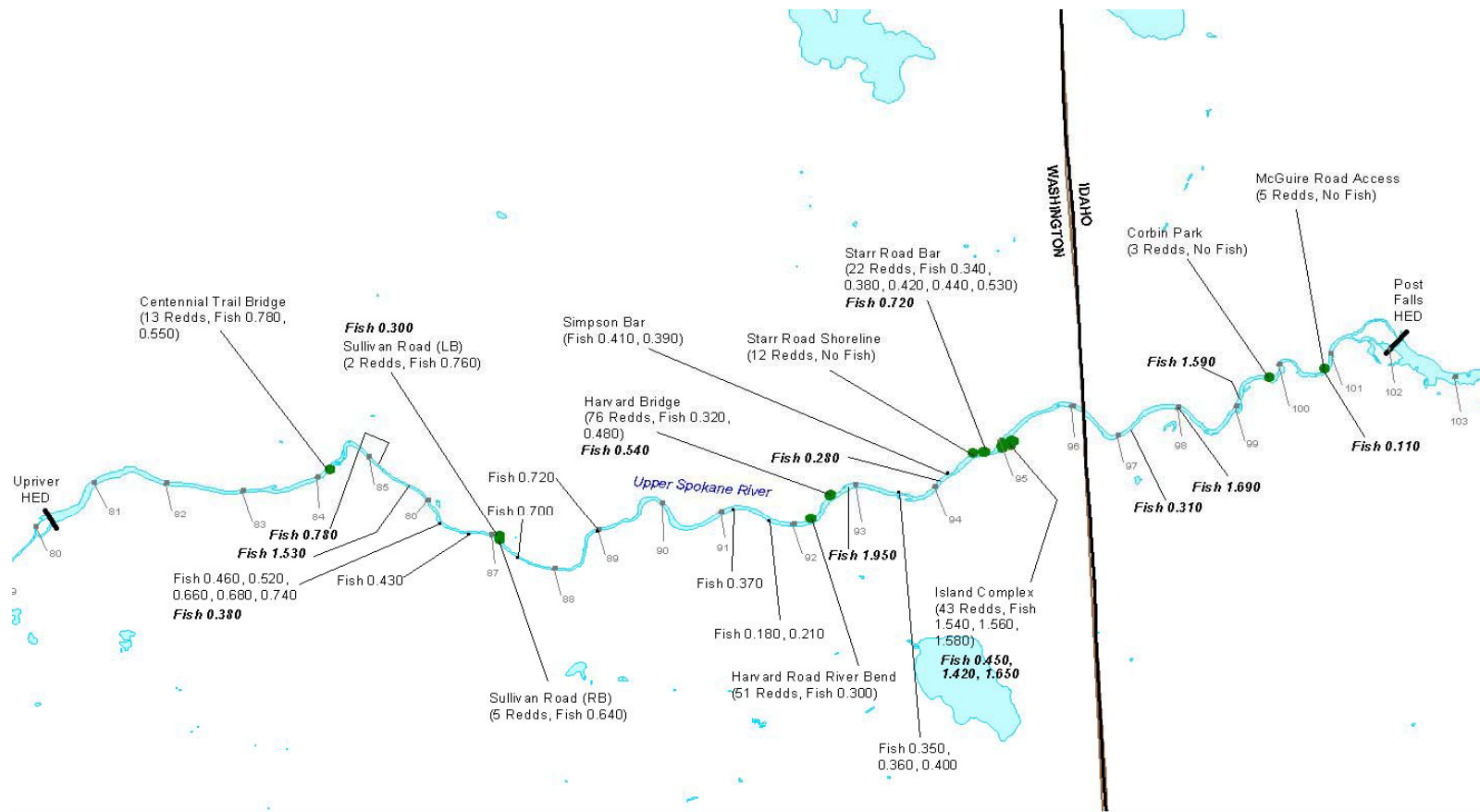


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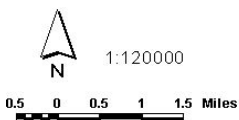


● Spawning Site  
 ■ River Mile  
 Fish 1.610 2003  
 Fish 1.610 2004

**Figure 19**  
**Location of Radio-Tagged**  
**Fish During the 2003 and**  
**2004 Spawning Seasons**  
**and Number of Redds**  
**Observed in 2003**



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 rainbow\_tracking-072704.apr [Upper Spokane River]



- Spawning Site
- River Mile
- Fish 1.610 2003
- Fish 1.610 2004

**Figure 20**  
**Location of Radio-Tagged**  
**Fish During the 2003 and**  
**2004 Spawning Seasons**  
**and Number of Redds**  
**Observed in 2003**

**Table 6. Locations of Radio-Tagged Rainbow Trout in the Upper River Study Reach, During the 2003 Spawning Period, Compared to the Location of Redds Observed in the Spokane River**

Spawning Location	River Mile	Radio-Tagged Fish	Redds <sup>a</sup>
McGuire Road access	100.7	None	5
Corbin Park	99.8	None	3
Island Complex (spawning reference area)	94.8-95.1	0.400, 1.540, 1.560	43
Starr Road Bar (spawning reference area)	94.7	0.340, 0.380, 0.420, 0.440, 0.530	22
Starr Road Shoreline	94.7	None	12
Simpson Bar	94.2	0.410, 0.390	None
Island Downstream of USGS Gauge	93.5	0.350, 0.360, 0.400	None
Harvard Road (spawning reference area)	92.6	0.320, 0.480	76
Harvard Road River Bend	92.1	0.300	51
Power Lines Upstream of Barker Road	91.3-91.6	0.180, 0.210, 0.370	None
Flora Road	89.0	0.720	None
Upstream of Sullivan Road	87.5	0.700	None
Sullivan Road (Left Bank)	87.2	0.760	2
Sullivan Road (Right Bank)	87.1	0.640	5
Downstream of Pines Road Bridge	86.9	0.430	None
Mirabeau Point Pool	86.3	0.460, 0.520, 0.660, 0.680, 0.740	None
Centennial Trail Bridge	84.0	0.550, 0.780	13

<sup>a</sup> Redds observed during 2003 spawning ground surveys (Parametrix 2003)

#### 4.4.2 Lower River Study Reach (March 2003 Fish Releases)

Seventeen (58%) of the 29 radio-tagged fish released in this reach in March moved greater than 0.5 miles upstream or downstream from their release location prior to or during the spawning period. Fish released in the upstream portion of the reach tended to move downstream and those released in the downstream portions generally moved upstream.

During the spawning period, 12 (41%) of the fish were located in areas where no redds were observed in 2003 (Table 7). Four of these fish were holding in areas between Latah Creek (RM 72.2) and the upper San Soucci spawning area (RM 71.6). Small pockets of suitable substrate were observed in these areas, but there were no obvious signs of spawning activity. Similarly, small areas of apparently suitable spawning substrate were found downstream of the T.J. Meenach Bridge, where three radio-tagged fish were detected during the spawning period, but no evidence of spawning activity was observed.

Six radio-tagged fish were detected in the mid- and lower San Soucci areas, where only one redd was found in 2003. Six other radio-tagged fish were detected in the area between the Spokane Rifle Club (RM 64.1) and Riverbend Bar (RM 68.4). These areas contained large boulder, cobble, and large gravel substrate, with isolated pockets of apparently suitable spawning gravel substrate, but no spawning activity or emergent fry were observed in 2003.

**Table 7. Locations of Radio-Tagged Rainbow Trout in the Lower River Study Reach During the 2003 Spawning Period, Compared to the Location of Redds Observed in the Reach**

Spawning Location	River Mile	Radio-Tagged Fish	Redds <sup>a</sup>
Maple Street Bridge	73.5	1.800	None
Peaceful Valley (Left Bank)	73.2	None	18
Peaceful Valley (Right Bank)	73.1	None	27
Latah Creek Confluence	72.2	0.560, 1.620	None
River Bend Downstream of Latah Creek	71.9	1.510	None
Upper San Soucci	71.4	0.580, 1.360, 1.780	11
Mid San Soucci	71.0	0.600, 1.320, 1.320, 1.460, 1.500	1
Lower San Soucci	70.5	1.440	None
T.J. Meenach Springs	70.1	1.640, 1.700, 1.760	52
Downstream of T.J. Meenach Bridge	69.5	1.400, 1.720, 1.740	None
River Bend Bar	68.4	0.800, 1.340	21
Downstream of Sewage Treatment Plant	66.9	1.420	None
Bowl and Pitcher Eddy	65.8	1.000	None
Downstream of Bowl and Pitcher Eddy	65.6	1.600, 1.660, 1.890	None
Downstream of Spokane Rifle Club	64.1	1.680	None

<sup>a</sup> Redds observed during 2003 spawning ground surveys (Parametrix 2003)

#### 4.5 POST 2003 SPAWNING SEASON/SUMMER ACTIVITY

Three snorkeling surveys were conducted during the summer to verify the presence of tagged fish exhibiting no signs of recent activity. Snorkeling was conducted on July 8 near the Idaho/Washington border, Harvard Road and Sullivan Road areas. On August 5 in the Island Complex and Harvard Road areas, and August 21 in the Island Complex area. The only tagged fish observed during these surveys (Fish 0.360) was located upstream of Sullivan Road on July 8. Although this tag was later detected upstream of Harvard Road on August 21, the erratic and inconsistent signals throughout the remainder of the monitoring period suggested that the tag was likely out of the water. Another fish was also observed from shore, on August 4, in the Mirabeau Point pool. Results of tracking efforts the following day suggest that it was likely Fish 1.560. This tag was detected about 8 miles upstream, at the Starr Road Bar (RM 94.7) on October 27, where the tag was subsequently recovered on June 25, 2004.

##### 4.5.1 Upper River Study Reach (March 2003 Fish Releases)

No consistent movement patterns were observed among upper river study reach fish immediately after the 2003 spawning period. Twelve fish (39%) exhibited no substantial movement either upstream or downstream of the areas occupied during the spawning season. Nine fish (29%) exhibited some upstream movement, although two of these eventually moved back downstream. The other fish generally moved downstream, including two that were later detected in the lower river study reach.

Only six fish moved downstream to (or past) the Sullivan Road area as water temperatures increased during the summer. Temperatures recorded in the Post Falls HED tailrace exceeded about 17° C by about June 7, and reached 25° C or higher in August. The aquifer springs downstream of Sullivan Road have been shown to reduce water temperatures by at least several degrees, thereby providing thermal refuge for fish during the summer months. While a limited number of fish moved downstream of Sullivan Road, five of the six fish released in this area either remained in this reach or returned to it by mid-summer.



Although no distinct behavior patterns were observed, over half of the fish were either undetected in the upper river or were no longer in this reach at some point after the spawning period (Table 8). Ten of these fish were not detected in the river after about mid-July, six tags were recovered from the streambed or the river banks by September, and two fish passed downstream to the lower river study reach. One of the fish that moved to the lower river reach was detected at only one location through September, and may have died, although we were not able to verify its status. The other fish that moved to the lower river exhibited some movement within the Riverbend Bar area through the summer. Efforts to visually observe this fish, either from the shoreline or through snorkeling surveys, were largely unsuccessful. As a result, at least seven of the stationary fish are suspected of having died or expelled their tags.

**Table 8. Status of Radio-Tagged Rainbow Trout, Released in the Upper River Study Reach, as of September 19, 2003**

Status of Tagged Fish	Tag Codes
Fish Not Detected In September	0.210, 0.390, 0.420, 0.430, 0.460, 0.520, 0.640, 0.660, 0.760 1.540
Tags Recovered By September	0.180, 0.300, 0.320, 0.370, 0.550, 0.720
Fish Exhibiting No Signs of Recent Activity	0.340, 0.350, 0.400, 0.410, 0.440, 0.480, 0.530, 0.700, 0.740, 1.580
Active Fish	0.360, 0.380, 0.680, 0.780, 1.560

#### 4.5.2 Lower River Study Reach (March 2003 Fish Releases)

No consistent movement patterns of fish in the lower river study reach were obvious after the 2003 spawning period. Seven fish moved downstream after spawning, three of which later moved back downstream to the area where they were initially tagged and released. Two fish moved (and remained) upstream after the spawning period, but the majority of the fish remained fairly close to the areas they occupied during the spawning period. Six fish were not detected in the lower reach after June 6, two additional tags were recovered, and another tag was located on land but not recovered. Ten fish exhibited little or no movement after early July, and ten others were believed to be alive through September (Table 9).

**Table 9. Status of Radio-Tagged Rainbow Trout, Released in the Lower River Study Reach, as of September 19, 2003**

Status	Tag Codes
Fish Not Detected In September	0.500, 0.560, 0.800, 1.760, 1.780, 1.800
Tags Recovered By September	0.600 <sup>a</sup> , 1.400, 1.420
Fish Exhibiting No Signs of Recent Activity	0.580, 1.000, 1.380, 1.500, 1.510, 1.640, 1.660, 1.680, 1.720, 1.890
Active Fish	1.320, 1.340, 1.360, 1.440, 1.460, 1.520, 1.600, 1.620, 1.700, 1.740

<sup>a</sup> Tag was located on land but not recovered

#### 4.6 FALL 2003-SPRING 2004 ACTIVITY

The 2004 tracking surveys began in January and continued through the spawning season (April) in the upper and lower river study reaches. No surveys were conducted after the 2004 spawning season in the lower river study reach. Additional surveys were conducted in June and July in the upper river reach to assess the summer distribution of tagged fish.

#### **4.6.1 Upper River Study Reach (March 2003 Fish Releases)**

Sixteen (52%) of the 31 March released tags were either undetected or recovered during the 2004 monitoring period. A total of 13 other tags exhibited no substantial movements in 2004. As a result, only two of the March-released fish (Fish 0.380 and 0.680) were known to be alive during the 2004 spawning season. Both of these fish moved about one quarter mile upstream from Mirabeau Point pool during the 2004 spawning season, before returning to the Mirabeau Point pool by June. One of these fish (Fish 0.680) was detected in this same area during the 2003 spawning season, while the other (Fish 0.380) was located at least 4 miles further upstream in the Starr Road Bar spawning area in 2003.

The status of five other fish (Fish 0.210, 0.360, 0.390, 0.780, and 1.560), was uncertain during the 2004 spawning season. The signal characteristics from two of these tags (Fish 0.360, and 0.390) suggested that these tags might not be in active fish (e.g., out of the water), but there was still some uncertainty as of June 2004. Similarly, the limited movement of Fish 0.780 also suggests that it may not be an active fish. Fish 1.560 moved about 8 miles upstream to near its release location by October 2003, but it exhibited no discernable movements through the 2004 spawning season. The tag was eventually recovered in this same area on June 25. Though this location is a known spawning area (Starr Road Bar), it is uncertain whether the fish died or expelled the tag before or after the 2004 spawning season. Similarly, Fish 0.210 was located a substantial distance upstream from its last 2003 detection location (in July) to upstream of Corbin Park. Some movement of this tag was observed in early March, however, the tag was later recovered in the same general area on March 25.

#### **4.6.2 Upper River Study Reach (November 2003 Fish Releases)**

Thirteen (93%) of the 14 rainbow trout radio-tagged in November were detected during the 2004 spawning season. The one undetected fish (Fish 1.400) was later detected after the spawning season (in June) downstream of Sullivan Road (RM 87.5). Ten (71%) of the November-released fish moved greater than 1 mile either upstream or downstream from the release locations during the 2004 monitoring period. Nine fish (64%) exhibited a net movement downstream, two (14%) moved upstream, while three (21%) exhibited little or no movement. Only one fish (Fish 1.650), which moved at least 1 mile after release, returned to near the release location by June.

Eight (57%) of the November-released fish were located in known spawning areas during the 2004 spawning season (Table 10), including seven in Washington spawning areas. However, we did not conduct extensive spawning and post-spawning season surveys (similar to the effort in 2003) to verify the occurrence or extent of spawning activity at each of the detection locations in 2004. Although two radio-tagged fish were located downstream of Pleasant View (between RM 98.0 and 98.3), no spawning activity was observed in these areas during the spawning season. We did observe spawning activity at a location upstream from Pleasant View (RM 99), although no radio-tagged fish were detected there in 2004, and no spawning activity was observed in this area in 2003.

Two November-released tags (Fish 0.310 and 1.530) were recovered on June 25. Fish 0.310 was located about 0.6 miles downstream of the release location by January, and the other about 12 miles downstream. No subsequent movements of these fish were observed after January, and neither of the recovery locations are known or suspected spawning areas. Ten of the other 12 tags were believed to be in active fish in June 2004, while the status of the other two (Fish 1.400 and 1.420) has not been verified by June.

During the pre-spawning period, a majority (64%) of the tagged fish occurred primarily in pool and eddy habitat adjacent to the stream banks. During the spawning and post-spawning seasons the majority of fish (64%, and 57% respectively) occurred in riffle, run or glide habitat.

**Table 10. Locations of November-Released Rainbow Trout in the Upper River Study Reach, During the 2004 Spawning Period, Relative to Known Spawning Areas (Observed in 2003 and/or 2004).**

Spawning Season Location	River Mile	Radio-Tagged Fish	Observed Spawning Area <sup>a</sup>
McGuire Road access	100.7	0.110	Yes
Pleasant View	98-99	1.590, 1690	No
Jacklin Seed	97.2	0.310	No
Island Complex (spawning reference area)	94.5-95.5	1.650, 1.420, 0.450	Yes
Starr Road Bar (spawning reference area)	94.7	0.720	Yes
Simpson Bar	94.2	0.280	Yes
Upstream of Harvard Road	93.0	1.950	No
Harvard Road (spawning reference area)	92.6	0.540	Yes
Sullivan Road (Right Bank)	87.1	0.300	Yes
Upstream of Mirabeau Point	86.3	0.380	No
Trent Bridge	85.2-85.5	1.530	No

<sup>a</sup> Extensive spawning and post-spawning redd surveys were conducted in 2003, but limited surveys occurred in 2004.

#### **4.6.3 Lower River Study Reach (March 2003 Fish Releases)**

By the end of the 2004 spawning season, 19 (66%) of the March released fish were known or suspected of having died or expelled their tags. Of these 19 tags, three were recovered and a fourth was located on shore but not recovered. In addition, seven fish exhibited no movement since at least September 2003, three others exhibited no movement since at least March 2004, and five were undetected in April.

Six of the lower river study reach tags were determined to be in active fish through the 2004 spawning season. All six of these fish exhibited some movements before or during the 2004 spawning season, although such movement was typically less than 0.4 miles. Three fish (Fish 1.380, 1.440, and 1.640) occurred in the same general area in 2004 that they occupied during the 2003 spawning season, and each of the other three fish (Fish 1.320, 1.460, and 1.520) occupied locations at least 1 mile away from their respective 2003 spawning season locations. As a result, there does not appear to be a distinct behavior pattern of fish returning to the same spawning locations from year to year in the lower river study reach.

The status of four other fish (Fish 1.340, 1.360, 1.620, and 1.700) was uncertain as of April 2004. These four fish exhibited little or no upstream or downstream movement through the 2004 monitoring period, but they did move laterally in the stream and/or occupied areas with suitable spawning habitat during the spawning period. As with the six known active fish, no particular spawning site fidelity was observed. There was at least a one-mile separation between the 2003 and 2004 spawning locations for two of these four fish, and no observed difference for one of the others. The fourth fish was located at least one mile upstream of its 2003 location, when it was last detected in early April.

#### **4.6.4 Lower River Study Reach (November 2003 Fish Releases)**

All 13 of the lower river study reach fish released in November were detected during the 2004 monitoring period. Nine fish (69%) moved at least one mile, prior to, or during the 2004 spawning season. This includes six fish moving downstream, and three moving upstream from their respective release locations. The other four fish exhibited little or no movement after release. Eight fish (62%) were located in known spawning areas in 2004 (Table 11).

**Table 11. Locations of November-Released Rainbow Trout in the Lower River Study Reach During the 2004 Spawning Period, Relative to Known Spawning Areas (Observed in 2003 and/or 2004)**

Spawning Season Location	River Mile	Radio-Tagged Fish	Observed Spawning Area <sup>a</sup>
Maple Street Bridge	73.5	0.320	Yes
Peaceful Valley (Left Bank)	73.2	0.180, 1.710	Yes
Peaceful Valley (Right Bank)	73.1	1.670	Yes
Latah Creek Bridge	72.6	0.620	No
River Bend Downstream of Latah Creek	71.9	1.610	No
Mid San Soucci	71.0	0.490 <sup>b</sup>	Yes
Lower San Soucci	70.5	1.630	No
River Bend Bar	68.4	0.570, 1.300, 1.570	Yes
Upstream of Sewage Treatment Plant	67.8	0.550	No
Upstream of Bowl & Pitcher	66.2	1.480 <sup>b</sup>	No

<sup>a</sup> Extensive spawning and post-spawning redd surveys were conducted in 2003, but limited surveys occurred in 2004.

<sup>b</sup> Status unknown due to limited movements during the 2004 monitoring period

#### **4.7 POST 2004 SPAWNING/SUMMER ACTIVITY**

Two surveys were conducted in the upper river study reach in June, but river conditions were not conducive to effectively conduct snorkel surveys to determine the status of all the tagged fish still detected in the reach. The results of the final surveys in July are provided in Appendix D of this report.

## 5. DISCUSSION

### 5.1 ELECTROFISHING/TAGGING

Suckers were the dominant fish species observed during electrofishing in both study reaches, which is similar to the results reported by Bailey and Saltes (1982). In contrast, Bennett and Underwood (1988) reported over three times as many rainbow trout as suckers in the Idaho reach in 1985, although they sampled at night which can be more effective for capturing trout than daytime electrofishing (Bailey and Saltes 1982). Similar to previous studies in the Spokane River, few northern pikeminnow, brown trout, cutthroat trout, and mountain whitefish were observed in the upper river reach (Bailey and Saltes 1982, Bennett and Underwood 1988). Bailey and Saltes (1982) also reported a large population of brook trout in the upper river study reach, with about equal numbers of brook and rainbow trout downstream of Sullivan Road (RM 87.7). In this study, we observed no brook trout in either the March or November sampling. Pfeiffer (1985) reported high numbers of northern pikeminnow in the lower river study reach and Kleist (1987) found few mountain whitefish in the lower river except for in a short section of river downstream of the sewage treatment plant (RM 63.9). In contrast, we observed numerous mountain whitefish throughout the lower river study reach, but found few northern pikeminnow.

More rainbow trout appeared to occur in the Idaho portion of the upper river reach in November than March, based on our electrofishing results. Only three rainbow trout were captured during five electrofishing runs through the 3.7-mile reach downstream of Corbin Park in March, compared to 10 fish in two passes in November. While Bailey and Saltes (1982) also reported greater electroshocking effectiveness in the fall, their comparisons were between April, July, September, and October electroshocking efforts. They suggested that electrofishing was more effective at water temperature of 10° C, in October, than at higher temperatures (particularly 17° C or higher). They also reasoned that these lower temperatures in the fall might stimulate feeding activity, making the fish more susceptible to capture. However, we observed no substantial temperature differences between our March sampling (5° - 7° C) and the November sampling efforts (8° - 9° C), but did not look at feeding activity. However, our radio tracking results indicate that a substantial number of Idaho-tagged fish moved downstream to Washington to spawn. Therefore, we assume that much of the apparent difference between the March and November sampling efficiencies could be due to pre-spawning movement of Idaho fish prior to our March sampling effort.

### 5.2 PRE- AND POST-SPAWNING ACTIVITY

The pre-spawning movement patterns of the March-released fish in the lower river study reach were similar to those observed in the upper river reach, with 48% and 42% (respectively) of the released fish moving more than about 0.5 miles after release. However, the post-spawning movement patterns were different, with only 8 (32%) of the detected fish moving more than 0.5 miles after the spawning season (compared to the 60% in the upper river reach). These data suggest that fewer of the lower river fish may have begun moving toward their spawning areas by the time the March tagging effort was conducted. This apparent difference in migration timing might be due to the timing of spawning in the two reaches. Parametrix (2003) observed that spawning occurred about a week later in the lower river reach in 2003.

The potential influence of the March tagging effort timing, on the observed pre-spawning season distances traveled by the upper river reach fish is also indicated by the greater distance that the November-released fish moved, compared to the March-released fish. About 57% of the upper river (November released) fish moved more than 0.5 mile prior to the 2004 spawning season, compared to the 42% for the March-released fish. In the lower river however, fewer (31%) of the November-released fish moved more than 0.5 miles than the March-released fish (48%).

The differences between fish movements in the upper and lower reaches could be because of the concentration of spawning in a few relatively large spawning areas in the upper river reach (Johnson 1997, Avista 2000a, Parametrix 2003) where fish from a large range appear to return to spawn, compared to the relatively small isolated spawning habitat in the lower river reach (Kleist 1987). Kleist reported widely distributed patchy spawning activity in the lower river study reach, typically located downstream of flow obstructions where spawning substrate tends to accumulate. This dispersed spawning habitat, and the corresponding low concentration of spawners, might reduce the need for the redistribution of post-spawning fish based on habitat availability. Another factor could be that some of the fish in the upper reach move to the thermal refuge areas downstream of Sullivan Road during the summer high water temperature period, resulting in greater post-spawning movements than would otherwise occur. Similar refuge areas have not been identified in the lower river reach, and we observed no obvious difference in sampling efficiencies between March and November. Therefore, the disperse spawning sites and the more uniform water temperature distribution in the lower river would tend to minimize the need for fish to travel substantial distances to spawn.

### **5.3 SPAWNING LOCATIONS**

Most (65%) of the fish tagged in the Idaho portion of the study area, likely spawned in Washington. In addition to all three fish tagged in Idaho in March, eight (57%) of the November fish were located in Washington during the respective spawning seasons. Again, this is likely due to the amount of spawning habitat available in Washington, within a few miles of the Idaho border (Johnson 1997; Avista 2000a; Parametrix 2003). Our results differed from Bennett and Underwood (1988) though, who found only one radio-tagged fish (16%) moving downstream into Washington during the spawning season.

In 2003, redds were observed in many of the same upper river reach spawning areas identified in previous years (Johnson 1997; Avista 2000a; Parametrix 2003). However we found that nearly half of the radio-tagged fish occurred in areas other than the previously identified spawning sites. In particular, we found five fish located just upstream of the Mirabeau Point pool area during the 2003 spawning period. One of these five fish, and one other fish, were also detected in this area during the 2004 spawning season. We observed no other indications of spawning activity in this area, during either the tracking surveys or the extensive spawning ground surveys conducted in 2003 (Parametrix 2003). Dispersed pockets of gravel substrate were observed through the typically large cobble/boulder substrate in this area, and may have been might be utilized by spawning rainbow trout.

Our results suggest that spawning may occur in more areas of the Spokane River than previously estimated. As a result, the existing information of spawning distribution in the upper river reach may overestimate the percentage of the total spawning that occurs in the spawning reference areas (Johnson 1997; Avista 2000a; Parametrix 2003). These reference areas are still valuable for assessing trends in the overall spawning population, given the amount of spawning that occurs there, site accessibility, visibility of both fish and redds during the spawning season, and the overall length of time that redds remain visible after the spawning season. Such site characteristics allow for more systematic and accurate assessments of spawning activity from year-to-year, than is feasible for the dispersed spawning activity that apparently occurs throughout the rest of the upper Spokane River.

The inability to detect spawning activity in a number of areas where tagged fish were observed during the spawning periods, due to water depth and poor visibility, also suggests that a greater proportion of the redds might be deeper than previously believed. The observations made in the T.J. Meenach springs spawning area in 2003 (Parametrix 2003) confirm that at least some deep water spawning occurs in the river, but the extent is unknown. Because these areas were in proximity to known suitable spawning habitat, we were unable to verify that spawning actually occurred in these areas. It is worthy to note that deeper redds would be less likely to be dewatered under the flow regimes that currently occur in the Spokane River.

Unlike in the upper river study reach, there is limited information concerning the spawning distribution of rainbow trout in the lower river reach. Kleist (1987) found limited spawning habitat in the free flowing reaches downstream of Monroe Street HED, and suggested that the apparent lack of spawning habitat limited the rainbow trout population in this reach. As in the upper study reach, the radio tagged fish were detected in a number of areas during the spawning period where no redds were observed. This again indicates that rainbow trout in the lower river reach may also be utilizing small gravel patches, which are difficult to locate and observe during high flow conditions in the spring.

While fish tended to occupy shoreline eddies much of the time, including during the spawning period, spawning may have occurred away from the shorelines. However, the flows occurring during the spawning period might limit access to some mid-channel areas containing suitable spawning substrate. While such areas might provide suitable spawning conditions, the spring flow conditions obscure signs of spawning activity in these isolated pocket gravel areas, particularly for the relatively small redds typically dug by rainbow trout. Kleist (1987) observed that much of the available spawning habitat in the lower river tended to be located downstream of large in-stream objects, such as boulders and concrete slabs. We typically observed spawning activity in relatively shallow areas downstream of inundated vegetation. Such vegetation provides similar functions as large instream objects, such as refuge from strong water velocities, decreased scouring effects, and facilitates the accumulation of smaller substrate material. Shallow water areas also provide better observation conditions than mid-channel pocket gravel areas, likely resulting in an underestimate of the amount of spawning activity because deeper areas are more likely to be excluded from observation.

We did not detect any radio-tagged fish passing the monitoring station in Latah Creek, from either the March or November tagging events, even though most (69%) of the fish were tagged and released within a mile upstream or downstream of the creek mouth. Therefore, Latah Creek is not believed to be an important spawning area for the adult rainbow trout population in the lower river reach.

Our results also suggest that spawning site fidelity may not be strong within the Spokane River population, although the data are very limited. Spawning site fidelity has been identified as a selective advantage that ensures that eggs are deposited in areas capable of supporting incubation and subsequent juvenile rearing (Westslope Fisheries 2003). One fish (Fish 0.680), which was tagged at Plantes Ferry (RM 84.4), apparently spawned upstream of Mirabeau Point pool area in 2003 (RM 86.4) and remained in the Mirabeau Point area through the following winter. This fish exhibited very good spawning site fidelity by returning to the same area again during the 2004 spawning period before moving back to the eddy by June. However, another fish (Fish 0.380), which occupied the same general areas from after the 2003 spawning season through the 2004 spawning season, was located in the Starr Road Bar spawning area (about 8.4 miles upstream) during the previous spawning season. These were the only two upper river study reach fish that were detected in known or suspected spawning areas in both 2003 and 2004. We also observed inconsistencies in spawning site fidelity in the lower river study reach. Of the nine fish that were detected throughout both the 2003 and 2004 spawning periods, four (44%) were located in the same general areas during both spawning seasons, while the other fish ranged between 1.2 and 7.3 miles away from the areas where they were located the previous spawning season.

## **5.4 SUMMER ACTIVITY**

No consistent summer behavior patterns were observed for the radio-tagged fish in either study reach, except that a majority of the fish tended to exhibit limited movements during the summer months. Bennett and Underwood (1988) also reported variable movement patterns of radio-tagged fish released in the Idaho reach in 1985, and no significant differences between release and recapture locations of other tagged fish (i.e., jaw tagged fish recaptured in the recreational fishery).

The area downstream of Barker Road is believed to provide thermal refuge from warm summer water temperatures, but few fish migrated downstream to this area in either year. Fish that were tagged in this reach did tend to remain there though. Bailey and Saltes (1982) found that the 8-10° C water entering the river from the aquifer in this area reduced the river water temperatures from 23° to 19° C between Sullivan Road and Mirabeau Point, and estimated that 75% of the salmonid population in the upper river resides between Barker Road and Plantes Ferry between July and September. Although we detected no obvious migration of radio-tagged fish to this reach, we did observe large concentrations of fish in the pools in this area during the summer.

Summer temperatures upstream of Barker Road typically exceed 20° C in July and August (Golder and HDR 2004), which are close to the critical temperatures for trout (Black 1953). Bailey and Saltes (1982) speculated that even though evidence suggests about 50% mortality in 24 hours for rainbow trout held in 24° C water, after being acclimated to 11° C water, the critical temperature in a natural system would likely be higher. They reason that water temperatures change gradually in a natural system, allowing for acclimation. Cooler water temperatures at night would also tend to mitigate the physiological effects of higher daytime temperatures. Golder and HDR (2004) reported that surface temperatures in the Spokane River fluctuate between 1 and 5° C daily, with the greatest diurnal variation occurring in the free-flowing reaches during the summer. In another study, Matthews et al. (1994) found that trout, tagged with temperature-sensitive radio tags, occupied water temperatures ranging up to 19.3° C, even when cooler water (14.5° C) was available in the same pool. This relatively wide water temperature range tolerated by rainbow trout might partially explain the limited thermal refuge behavior of our tagged fish.

Bennett and Underwood (1988) observed that radio-tagged fish were typically located on the river margins out of the main current during the high spring run-off period. While we observed similar behavior of the radio-tagged fish in the spring, they tended to occupy shallow riffle habitat away from shore in late spring and summer, particularly in the lower river study reach. This behavior is consistent with that observed by Bailey and Saltes (1982). Lower summer flows allow fish to hold in shallow water riffle areas, with less effort than at higher flows. Lewis (1969) identified water velocity as the most important microhabitat variable for rainbow trout. Riffle areas are also generally more productive feeding areas, and can be areas of colder upwelling groundwater, particularly if located at pool tailouts.

Two of the upper river reach fish passed downstream of the three HEDs to the lower river study reach, but the exact timing of these movements are uncertain because there were at least 7 weeks between the last detection in the upper reach and the first detection in the lower reach. A lower river fish was also detected in the vicinity of Nine Mile HED between April 19 and 23, 2003, but was not detected in the lower river reach again through April 2004. Parametrix (2004) reported that high spring flows are probably responsible for most instances of fish passing downstream of the Spokane River dams, but that the overall turbine entrainment rates were likely moderate to low. Our results support this assessment of low turbine entrainment of downstream movement of fish past the dams.

## **5.5 MORTALITY**

We observed substantially lower survival rates in this study (as low as 6%) as compared to the approximate 30% survival reported by Bennett and Underwood (1988) for Spokane River trout. However, their estimates were based on tag recapture data from multiple age-classes, and their fish were not exposed to the substantial stress of surgical tag implantation. Hockersmith et al. (1995) report that mortality rates of adult spawning age fish might not be representative of the population because they are the oldest segment of the population, and are likely more susceptible to natural mortality. Henderson et al. (2000) reported 22% mortality within 10 weeks of implanting radio tags in trout, and Bunnell and Isely (1999) reported tagging-related mortality rates of between 7 and 25%. The additional effects of spawning, relatively soon after tagging, might also have contributed to the overall high mortality rate



observed. Hockersmith et al. (1995) reported a 6% post-spawning mortality rate of radio-tagged rainbow trout, although their fish were tagged in February and ours were tagged in March.

Other likely mortality sources are predation and angling. Hockersmith et al. (1995) reported predation rates of 4% for radio-tagged rainbow trout in the Yakima River. We recovered four tags on shore, which were likely the result of predation. One was recovered at the base of an osprey perch tree, and another at the base of a telephone pole. In addition, we tracked a tag to an apparent otter den, and recovered another with a gnawed antenna adjacent to the remains of a fish skeleton.

Bennett and Underwood (1988) estimated fishing mortality in the Idaho portion of the upper Spokane River at less than 10%. However, the concentration of fish in relatively small areas could intensify the impacts of fishing pressure in certain river reaches. For example, Bailey and Saltes (1982) reported that the greatest fishing pressure in 1980 and 1981 in the upper Spokane River was in the area downstream of Barker Road. Fifty percent of the tags, that were undetected in the upper river study reach during the late spring and summer, were last detected downstream of Barker Road. Although the Washington portion of the upper river study reach is restricted to a catch and release fishery and artificial bait, we often observed anglers violating these regulations. It is possible that many of the undetected radio-tagged fish were the result of such violations, although tag failure could have also contributed to the number of undetected tags.

We observed greater mortality rates among the fish released in March than in November. This contrasts with Bennett and Underwood (1988) who estimated greater natural mortality for fall-released fish, and with Shetter (1968) who suggested that overwinter mortality was a major source of natural mortality. However, Bennett and Underwood (1988) also indicated that post-spawning mortality can be delayed by as much as 2 months, and we have not yet fully verified the status of all the study fish due to relatively high water levels through June. Snorkel surveys will be conducted in July to verify fish status.

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**APPENDIX A**

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**Rainbow Trout Captured in the Spokane River for  
Radio Tagging, 2003**

## APPENDIX A

### Rainbow Trout Captured in the Spokane River for Radio Tagging, 2003

Date	Fish #	Fork Length	Sex	Frequency	Genetic Sample #	Whirling Disease Sample	Latitude	Longitude	Location
3/10	RBT-1	382	M	150.440			N47.41.837	W117.02.462	Right Bank at downstream I-90 bridge
3/10	RBT-2	388	M	150.410			N47.41.800	W117.03.380	Left Bank at I-90 rest area
3/10	RBT-4	408	F	150.460			N47.41.368	W117.04.322	Left Bank D.S. of Starr Rd Bar
3/10	RBT-5	381	M	150.400			N47.41.368	W117.04.322	Left Bank D.S. of Starr Rd Bar
3/10	RBT-6	319	F	150.430					Left Bank D.S. of Starr Rd Bar
3/10	RBT-7	395	---	150.390					Left Bank D.S. of Starr Rd Bar
3/11	RBT-11	387	F	150.420	03AB-91		N47.41.517	W117.01.961	Left Bank near bend U.S. of I-90
3/11	RBT-12	360	M	150.380	03AB-81				Left Bank D.S. of Starr Rd Bar
3/11	RBT-13	377	F	150.350	03AB-71				Left Bank below side channel U.S. of Harvard Rd
3/11	RBT-14	410	M	150.360	03AB-61				Right Bank below side channel U.S. of Harvard Rd
3/12	RBT-15	340	M	150.320	03AB-51		N47.40.691	W117.07.031	Left Bank 400' D.S. Harvard Rd.
3/12	RBT-16	368	M	150.370	03AB-41		N47.40.669	W117.07.089	Left Bank 500' D.S. Harvard Rd.
3/12	RBT-17	377	M	150.340	03AB-31		N47.40.656	W117.07.162	Left Bank 600' D.S. Harvard Rd.
3/12	RBT-18	343	M	150.300	03AB-21		N47.40.647	W117.07.245	Left Bank 700' D.S. Harvard Rd.
3/12	RBT-19	358	F	150.210	03AB-11		N47.40.743	W117.07.731	Right Bank 1000' D.S. Harvard Rd.
3/12	RBT-20	292	M	150.720	03AB-1		N47.40.743	W117.07.731	Right Bank 1000' D.S. Harvard Rd.
3/12	RBT-21	390	F	150.180	03AB-92		N47.40.891	W117.08.087	Right Bank 1200' D.S. Harvard Rd.
3/12	RBT-22	348	M	150.700	03AB-82		N47.40.321	W117.11.609	Right Bank 200' U.S. Sullivan Rd
3/12	RBT-23	385	F	150.640	03AB-62		N47.40.561	W117.12.159	Right Bank 100' U.S. Pines Rd
3/12	RBT-24	304	F	150.760	03AB-42		N47.40.561	W117.12.159	Right Bank 100' U.S. Pines Rd
3/12	RBT-25	393	F	150.740	03AB-32		N47.40.900	W117.13.223	Right Bank at D.S. end of Kaiser Plant
3/12	RBT-26	395	F	150.660	03AB-22		N47.40.900	W117.13.223	Right Bank at D.S. end of Kaiser Plant
3/12	RBT-27	---	---	150.680	03AB-12		N47.40.900	W117.13.223	Right Bank at D.S. end of Kaiser Plant
3/12	RBT-28	389	M	150.780	03AB-2		N47.41.612	W117.14.850	Released at Plantes Ferry access ramp
3/12	NA	326	M		03AB-72	X	N47.40.321	W117.11.609	Right Bank just U.S. Pines Rd Bridge
3/12	NA	---	---		03AB-52	X	N47.40.561	W117.12.159	Right Bank just U.S. Pines Rd Bridge
3/13	RBT-29	427	F	150.530	03AB-93		N47.41.832	W117.01.471	Right Bank D.S. Jacklin Seed Plant

## APPENDIX A

### Rainbow Trout Captured in the Spokane River for Radio Tagging, 2003 (continued)

Date	Fish #	Fork Length	Sex	Frequency	Genetic Sample #	Whirling Disease Sample	Latitude	Longitude	Location
3/13	RBT-30	386	M	151.580	03AB-73		N47.41.842	W117.03.247	Left Bank upper end of I-90 rest area
3/13	RBT-31	372	M	150.520	03AB-63		N47.41.368	W117.04.322	Left Bank D.S. of Starr Rd Bar
3/13	RBT-32	403	M	151.560	03AB-53		N47.41.349	W117.04.371	Left Bank D.S. of Starr Rd Bar
3/13	RBT-33	397	F	151.540	03AB-43		N47.41.092	W117.04.901	Left Bank 500' U.S. Gauging Station
3/13	RBT-34	381	M	150.480	03AB-23		N47.41.078	W117.06.028	Right Bank 600' U.S. Harvard Rd
3/13	RBT-35	378	F	150.550	03AB-3		N47.41.124	W117.06.287	Released at Harvard Bridge
3/13	RBT-36	---	---	NA	03AB-94	X	N47.41.124	W117.06.287	Captured with RBT 35
3/13	NA	245	---	NA	03AB-13	X	N47.41.078	W117.06.028	Captured with RBT 34
3/13	NA	253	---	NA	03AB-33		N47.41.092	W117.04.901	Captured with RBT 33
3/13	NA	347	---	NA	03AB-83		N47.41.517	W117.01.961	Left Bank near bend U.S. of I-90
3/14	RBT-37	340	F	151.640	03AB-84		N47.39.577	W117.26.945	USGS Gauge
3/14	RBT-38	363	F	150.500	03AB-74		N47.39.577	W117.26.945	USGS Gauge
3/14	RBT-39	423	F	151.620	03AB-64		N47.39.470	W117.27.354	Old bridge Xing
3/14	RBT-40	378	F	151.440	03AB-54		N47.39.470	W117.27.354	Old bridge Xing
3/14	RBT-41	382	F	150.560	03AB-44		N47.39.470	W117.27.354	Old bridge Xing
3/14	RBT-42	327	F	151.460	03AB-34		N47.39.470	W117.27.354	Old bridge Xing
3/14	RBT-43	331	M	151.510	03AB-24		N47.39.731	W117.27.255	Opposite Latah Ck
3/14	RBT-44	343	F	151.360	03AB-14		N47.39.731	W117.27.255	Opposite Latah Ck
3/14	RBT-45	386	F	150.580	03AB-4		N47.39.731	W117.27.255	Opposite Latah Ck
3/14	RBT-46	382	F	151.520	03AB-95		N47.39.971	W117.27.751	Upper San Soucci
3/14	RBT-47	360	F	151.320	03AB-85		N47.39.971	W117.27.751	Upper San Soucci
3/14	RBT-48	375	F	151.420	03AB-65		N47.39.971	W117.27.751	Upper San Soucci
3/14	RBT-49	365	F	150.600	03AB-35		N47.40.433	W117.27.281	Lower San Soucci
3/14	RBT-50	326	F	151.500	03AB-25		N47.40.433	W117.27.281	Lower San Soucci
3/14	RBT-51	364	M	151.380	03AB-15		N47.40.433	W117.27.281	Lower San Soucci
3/14	RBT-52	342	F	151.000	03AB-96		N47.40.589	W117.26.860	Springs above T.J.M.Br.
3/14	RBT-53	323	M	151.400	03AB-76		N47.40.589	W117.26.860	Springs above T.J.M.Br.
3/14	NA	330	M	NA	03AB-55		N47.39.971	W117.27.751	Upper San Soucci

## APPENDIX A

### Rainbow Trout Captured in the Spokane River for Radio Tagging, 2003 (continued)

Date	Fish #	Fork Length	Sex	Frequency	Genetic Sample #	Whirling Disease Sample	Latitude	Longitude	Location
3/14	NA	355	M	NA	03AB-86		N47.40.589	W117.26.860	Springs above T.J.M.Br.
3/14	NA	366	M	NA	03AB-45		N47.40.433	W117.27.281	Lower San Soucci
3/14	NA	375	---	NA	03AB-5	X	N47.40.589	W117.26.860	Springs above T.J.M.Br.
3/14	NA	---	---	NA	03AB-75	X	N47.39.971	W117.27.751	Upper San Soucci
3/15	RBT-54	361	F	151.720	03AB-66		N47.41.121	W117.28.662	Upper River Bend
3/15	RBT-55	350	M	151.340	03AB-56		N47.41.121	W117.28.662	Upper River Bend
3/15	RBT-56	359	F	151.700	03AB-46		N47.41.121	W117.28.662	Upper River Bend
3/15	RBT-57	334	F	151.740	03AB-36		N47.41.121	W117.28.662	Upper River Bend
3/15	RBT-58	318	M	150.800	03AB-16		N47.41.260	W117.28.623	River Bend Bar
3/15	RBT-59	347	F	151.780	03AB-6		N47.41.260	W117.28.623	River Bend Bar
3/15	RBT-60	359	F	151.760	03AB-87		N47.41.750	W117.28.674	Treatment Plant
3/15	RBT-61	385	F	151.800	03AB-77		N47.41.750	W117.28.674	Treatment Plant
3/15	RBT-62	356	F	151.660	03AB-57		N47.42.259	W117.29.716	Below Bowl & Pitcher
3/15	RBT-63	330	M	151.600	03AB-47		N47.42.259	W117.29.716	Below Bowl & Pitcher
3/15	RBT-64	357	M	151.890	03AB-37		N47.42.259	W117.29.716	Below Bowl & Pitcher
3/15	RBT-65	368	M	151.680	03AB-27		N47.42.259	W117.29.716	Below Bowl & Pitcher
3/15	NA	267	F	NA	03AB-26		N47.41.260	W117.28.623	River Bend Bar
3/15	NA	290	F	NA	03AB-17		N47.42.259	W117.29.716	Below Bowl & Pitcher
3/15	NA	300	F	NA	03AB-7		N47.42.259	W117.29.716	Below Bowl & Pitcher
3/15	NA	330	F	NA	03AB-98		N47.42.259	W117.29.716	Below Bowl & Pitcher
3/15	NA	340	F	NA	03AB-88		N47.42.259	W117.29.716	Below Bowl & Pitcher
3/15	NA	370	F	NA	03AB-67	X	N47.41.750	W117.28.674	Treatment Plant
3/15	NA	378	F	NA	03AB-97		N47.41.260	W117.28.623	River Bend Bar
11/20	NA	420	---	150.110	NA		N47.42.136	W116.58.647	D.S. McGuire
11/18	NA	400	---	150.180	NA		N47.39.541	W117.26.604	D.S. Pleasant Valley Put-in
11/20	NA	382	---	150.280	NA		N47.41.721	W117.02.287	U.S. Stateline
11/20	NA	343	---	150.300	NA		N47.41.721	W117.02.287	U.S. Stateline

## APPENDIX A

### Rainbow Trout Captured in the Spokane River for Radio Tagging, 2003 (continued)

Date	Fish #	Fork Length	Sex	Frequency	Genetic Sample #	Whirling Disease Sample	Latitude	Longitude	Location
11/20	NA	415	---	150.310	NA		N47.41.880	W117.01.346	U.S. Jacklin Seed
11/18	NA	356	---	150.320	NA		N47.39.541	W117.26.604	D.S. Pleasant Valley Put-in
11/20	NA	402	---	150.450	NA		N47.41.721	W117.02.287	U.S. Stateline
11/18	NA	384	---	150.490	NA		N47.39.897	W117.27.413	Released at lower San Soucci
11/20	NA	405	---	150.540	NA		N47.41.677	W117.00.127	U.S. Pleasant View Br.
11/18	NA	335	---	150.550	NA		N47.39.897	W117.27.413	Released at lower San Soucci
11/18	NA	349	---	150.570	NA		N47.39.420	W117.27.285	Old bridge Xing
11/18	NA	367	---	150.620	NA		N47.39.420	W117.27.285	Old bridge Xing
11/20	NA	468	---	150.720	NA		N47.41.721	W117.02.287	U.S. Stateline
11/18	NA	319	---	151.300	NA		N47.39.420	W117.27.285	Old bridge Xing
11/18	NA	395	---	151.420	NA		N47.42.136	W116.58.647	D.S McGuire Gauge
11/18	NA	315	---	151.480	NA		N47.39.897	W117.27.413	Released at T.J. Meenach ramp
11/20	NA	387	---	151.530	NA		N47.41.591	W117.01.758	D.S. Jacklin Seed
11/18	NA	379	---	151.540	NA		N47.42.136	W116.58.647	D.S McGuire Gauge
11/18	NA	317	---	151.570	NA		N47.39.897	W117.27.413	Released at T.J. Meenach ramp
11/20	NA	388	---	151.590	NA		N47.41.653	W117.00.628	D.S. Pleasant View Br.
11/18	NA	374	---	151.610	NA		N47.39.897	W117.27.413	Released at lower San Soucci
11/18	NA	339	---	151.630	NA		N47.39.897	W117.27.413	Released at lower San Soucci
11/20	NA	362	---	151.650	NA		N47.41.591	W117.01.757	D.S. Jacklin Seed
11/18	NA	418	---	151.670	NA		N47.39.541	W117.26.604	D.S. Pleasant Valley Put-in
11/20	NA	392	---	151.690	NA		N47.41.653	W117.00.628	D.S. Pleasant View Br.
11/18	NA	347	---	151.710	NA		N47.39.420	W117.27.285	Old bridge Xing
11/20	NA	353	---	151.950	NA		N47.42.136	W116.58.647	D.S. McGuire



**APPENDIX B**

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**Spokane River Landmarks and  
Corresponding River Miles**

## APPENDIX B

### Upper River Study Reach Landmarks and Corresponding River Miles

Location	River Mile
<b>Upper River Study Reach</b>	
Post Falls HED	102.0
McGuire Gauge	100.5
McGuire Road	100.1
Corbin Park	99.8
Pleasant View	98.7
Jacklin Seed Plant	97.0
Idaho/Washington State Line	96.1
Interstate 90 Bridge	96.0
Interstate 90 Rest Area	95.5
Island Complex	95.1
Starr Road Bar	94.7
Simpson Bar	94.2
USGS Gauge	93.7
I-90 Island	93.5
Harvard Road	92.7
Harvard Road Riverbend	92.0
Centennial Trail Mile 5	91.6
Power lines Upstream of Barker Road	91.3
Barker Road	90.4
Flora Rapids	88.5
Sullivan Road	87.7
Railroad Bridge Downstream of Sullivan Road	87.1
Pines Road	87.1
Mirabeau Point	86.2
Plantes Ferry	84.6
Centennial Trail Bridge	84.1

## Lower River Study Reach Landmarks and Corresponding River Miles

Location	Rivermile
<b>Lower River Study Reach</b>	
Monroe Street HED	74.0
Maple Street Bridge	73.5
Maple Street Put-in	73.3
Pleasant Valley (Right Bank)	73.4
Pleasant Valley (Left Bank)	73.4
USGS Gauge	72.7
Old Bridge Crossing Upstream of Latah Creek	72.4
Latah Creek	72.2
Upper San Soucci	71.2
Mid-San Soucci	71.0
Lower San Soucci	70.6
Old Bridge Downstream of San Soucci	70.5
T.J. Meenach Springs	70.2
T.J. Meenach Bridge	69.7
Riverbend Bar	68.4
Sewage Treatment Plant	67.3
Bowl and Pitcher	66.1
Devils Toenail	65.1
Spokane Rifle Club	64.4

**APPENDIX C**

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**Fish Tracking Summaries**

## APPENDIX C

### Fish Tracking Summaries

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
11/18/03		0.180	D.S. Pleasant Valley Put-in	73.10	LB	Eddy	Tagged	Release site
1/22/04	9:30	0.180		73.10	LB	Run	Boat	At riverbend D.S. of Pleasant Valley put-in
3/13/04	9:00	0.180		73.05	LB	Eddy	Boat	D.S. of Maple St. Put-in, by stone wall
3/18/04	9:50	0.180		73.09	RB	Eddy	Boat	Across from Maple St. Put-in, in willows
3/24/04	10:10	0.180		73.10	RB		Boat	River bend D.S. from Maple St. Put-in
3/30/04	10:30	0.180		73.50			Boat	U.S. from Maple St. Put-in
4/5/04	12:05	0.180		72.90	RB	Eddy	Boat	Along shoreline veg., 300 ft U.S. USGS gauge
4/9/04	9:45	0.180		72.80	RB	Brush	Boat	Along shoreline veg., 200 ft U.S. USGS gauge
4/13/04		0.180		72.80	RB	Brush	Boat	300 ft U.S. USGS in inundated willows
4/16/04	13:25	0.180		72.80	RB	Brush	Boat	300 ft U.S. USGS in inundated willows
4/18/04	13:35	0.180		72.80	LB	Eddy	Boat	Eddy along riffle 500' US USGS
4/23/04	10:05	0.180		72.30	RB	Brush	Boat	Brush across from Latah Creek
4/26/04	10:20	0.180		72.30	LB	Riffle	Boat	U.S. edge of Latah Creek confluence
11/18/03		0.320	D.S. Pleasant Valley Put-in	73.10	LB	Eddy	Tagged	Release site
1/22/04	9:30	0.320		73.10	RB	Run	Boat	At riverbend D.S. of Pleasant Valley put-in
3/13/04	8:55	0.320		73.05	RB	Run	Boat	Opposite Fish 0.180, in inundated brush and fallen tree
3/18/04	9:50	0.320		73.05	RB	Eddy	Boat	Across from Maple St. Put-in
3/24/04	10:10	0.320		73.10	RB		Boat	River bend D.S. from Maple St. Put-in
3/30/04	10:30	0.320		73.17	RB	Eddy	Boat	Upstream of spawning area at Peaceful Valley
4/5/04	12:00	0.320		73.18	RB	Eddy	Boat	Eddy across from Peaceful Valley put-in
4/9/04	9:40	0.320		73.20	RB	Eddy	Boat	Eddy across from Peaceful Valley put-in
4/13/04	9:00	0.320		73.20	LB	Eddy	Boat	100 ft D.S. put-in, in brush eddy
4/16/04	13:20	0.320		73.20	LB	Eddy	Boat	Riverbend D.S. put-in
4/18/04	13:30	0.320		73.20	LB	Brush	Boat	Riverbend D.S. put-in
4/23/04	9:40	0.320		73.20	LB	Brush	Boat	LB eddy D.S. of spawning area
4/26/04	9:45	0.320		73.20	LB	Eddy	Boat	Lower bar D.S. put-in

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
11/18/03		0.490	Released bend D.S. of Latah Ck	71.80	RB	Eddy	Tagged	Release site
1/22/04	10:15	0.490		70.80	LB	Run	Boat	San Soucci riverbend
3/13/04	10:25	0.490		71.07	RB	Run	Boat	Mid San Soucci
3/18/04	10:30	0.490		71.07	RB	Run	Boat	Mid San Soucci
3/24/04		0.490		71.07	RB	Run	Boat	Mid San Soucci
3/30/04	11:15	0.490		71.07	RB	Run	Boat	500 ft U.S. of San Soucci riverbend, in brush
4/5/04	13:00	0.490		71.07	RB	Run	Boat	500 ft U.S. of San Soucci riverbend, in brush
4/9/04	10:05	0.490		71.07	RB	Brush	Boat	500 ft U.S. of San Soucci riverbend, in brush
4/13/04	9:45	0.490		71.10	RB	Brush	Boat	300 ft U.S. riverbend @ San Soucci
4/16/04	13:50	0.490		71.10	RB	Brush	Boat	500 ft U.S. riverbend @ San Soucci
4/18/04		0.490		71.10	RB	Brush	Boat	500 ft U.S. riverbend @ San Soucci
4/23/04	10:20	0.490		71.10	RB	Brush	Boat	500 ft U.S. riverbend @ San Soucci
4/26/04	10:35	0.490		71.10	RB	Brush	Boat	RB brush along shoreline along riffle
3/14/03	11:57	0.500	USGS Gauge	72.70	RB	Eddy	Tagged	Release site
3/17/03	15:30	0.500		72.80		Eddy	Land-based	U.S. of release site
4/3/03	12:00	0.500		72.70			Land-based	Near USGS Gauge
4/4/03	9:50	0.500		73.23	LB	Eddy	Boat	U.S. from release site, in eddy D.S. of Maple St. ramp
4/10/03		0.500		NA			Boat	Not Detected
4/18/03	9:50	0.500		72.20			Boat	Latah Creek
4/19/03		0.500		NA			Boat	Assumed Dead - Not detected through the monitoring period
11/18/03		0.550	Released at lower San Soucci	70.70	RB	Eddy	Tagged	Release site
1/22/04	10:55	0.550		68.50	LB	Run	Boat	Upper Riverbend pool
3/13/04	10:20	0.550		71.45	RB	Eddy	Boat	Upper San Soucci
3/18/04	10:55	0.550		70.50		Eddy	Boat	500 ft D.S. of water main crossing D.S. of San Soucci
3/24/04	12:40	0.550		67.50		Riffle	Boat	U.S. of Treatment Plant
3/30/04	12:15	0.550		67.87	LB	Run	Boat	Riverbend between rightbank bar and Treatment Plant
4/5/04	14:00	0.550		67.83	LB		Boat	Riverbend D.S. of Riverbend Bar

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/9/04	10:50	0.550		67.80	LB		Boat	Riverbend 1000 ft. D.S. of Riverbend Bar
4/13/04	10:45	0.550		67.80	LB	Glide	Boat	Riverbend 300 ft U.S. treatment plant
4/16/04	14:45	0.550		67.80	LB	Glide	Boat	Riverbend 300 ft U.S. treatment plant
4/18/04	15:05	0.550		67.80	LB		Boat	Riverbend 200 ft U.S. treatment plant
4/23/04	11:15	0.550		67.80	LB	Glide	Boat	300 ft U.S. riffle U.S. treatment plant
4/26/04	11:30	0.550		67.95	LB	Glide	Boat	100 ft U.S. riffle U.S. treatment plant
3/14/03	12:55	0.560	Old bridge Xing	72.37	RB	Eddy	Tagged	Release site
3/17/03		0.560		72.10			Land-based	300 ft. D.S. Latah Creek
4/3/03	12:00	0.560		72.70			Land-based	Near USGS Gauge
4/4/03	10:10	0.560		NA			Boat	Up Latah Creek, near mouth
4/10/03	11:00	0.560		72.00	RB	Eddy	Boat	Below Latah Creek
4/18/03	10:00	0.560		72.00	LB	Eddy	Boat	200 ft. D.S. Latah Creek
4/19/03	10:15	0.560		72.20	LB	Eddy	Boat	Near Latah Creek mouth
4/22/03	9:25	0.560		72.20	LB	Eddy	Boat	Near Latah Creek mouth
4/24/03	10:00	0.560		72.20	LB	Eddy	Boat	D.S. edge of Latah Creek mouth
4/29/03		0.560		72.20	LB	Eddy	Boat	D.S. edge of Latah Creek mouth
5/15/03	11:10	0.560		69.80	RB		Boat	T.J. Meenach Springs - lower end
5/21/03	11:30	0.560		69.80	Mid		Boat	200 ft. U.S. of T.J. Meenach Bridge
6/6/03	10:10	0.560		69.80	RB		Boat	100 ft. U.S. of T.J. Meenach Bridge
6/23/03		0.560		NA			Boat	Assumed Dead - Not detected through the monitoring period
11/18/03		0.570	Old bridge Xing	72.33	RB	Eddy	Tagged	Release site
1/22/04	10:55	0.570		68.40	LB	Pool	Boat	Riverbend Bar
3/13/04		0.570		NA			Boat	Not Detected
3/18/04		0.570		NA			Boat	Not Detected
3/24/04		0.570		NA			Boat	Not Detected
3/30/04		0.570		NA			Boat	Not Detected
4/5/04		0.570		NA			Boat	Not Detected
4/9/04	10:40	0.570		68.40	LB	Glide	Boat	Upper Riverbend Bar - Possibly spawning
4/13/04	10:35	0.570		68.40		Glide	Boat	Riverbend pool
4/16/04	14:35	0.570		68.40		Pool	Boat	Mid Riverbend pool
4/18/04	14:00	0.570		68.30		Pool	Boat	DS end Riverbend pool

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/23/04	11:00	0.570		68.40	Mid	Pool	Boat	Mid Riverbend pool
4/26/04	11:10	0.570		68.30	Mid	Pool	Boat	lower Riverbend pool
3/14/03	14:05	0.580	Opposite Latah Ck	72.03	RB	Eddy	Tagged	Release site
3/17/03		0.580		72.10			Land-based	300 ft. D.S. Latah Ck
4/2/03	14:00	0.580		71.65	LB	Eddy/Brush	Boat	Around the bend below Latah Ck, in brushy area
4/4/03	10:23	0.580		71.65	RB	Eddy/Brush	Boat	D.S of Latah around the big bend, across from gravel bar
4/10/03		0.580		71.40	RB		Boat	Upper San Soucci
4/18/03	10:10	0.580		71.40	RB		Boat	Upper San Soucci
4/19/03	11:25	0.580		71.40	RB		Boat	Upper San Soucci
4/22/03	10:00	0.580		71.80	LB		Boat	Upper San Soucci
4/24/03	10:15	0.580		71.80	LB		Boat	Upper San Soucci
4/29/03		0.580		71.55	LB		Boat	Upper San Soucci
5/15/03	10:35	0.580		71.50	RB		Boat	Upper San Soucci
5/21/03	10:25	0.580		71.60	RB		Boat	Upper San Soucci
6/6/03	10:50	0.580		67.00	RB		Boat	400 ft. D.S. of Treatment Plant Br.
6/23/03		0.580		NA			Boat	Not Detected
7/9/03	15:30	0.580		67.10	RB	Riffle	Boat	First riffle D.S. of Treatment Plant
7/24/03		0.580		NA		NA	Boat	Not Detected
8/7/03	12:10	0.580		65.30	RB	Glide	Boat	Glide U.S. of Devils Toenail
8/20/03	13:00	0.580		66.20		Pool		500 ft U.S. Bowl and Pitcher footbridge
9/4/03	12:55	0.580		66.20		Pool		Pool U.S. bridge @ Bowl and Pitcher
9/19/03	11:40	0.580		66.20		Pool		Pool U.S. bridge @ Bowl and Pitcher
10/29/03	12:35	0.580		66.30		Pool		Pool U.S. bridge @ Bowl and Pitcher
1/22/04	12:35	0.580		66.30		Pool		Assumed dead - No movement through monitoring period
3/14/03	15:55	0.600	Lower San Soucci	70.62	LB	Eddy	Tagged	Release site
3/17/03		0.600		70.60			Land-based	Between T.J.Meenach Bridge and San Soucci
4/2/03	14:05	0.600		70.80	LB	Eddy	Boat	At San Soucci bend, U.S. of release site
4/4/03	10:34	0.600		71.10	LB	Eddy	Boat	U.S. from release, in area of inundated brush



## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/10/03		0.600		71.10	RB	Eddy	Boat	Upper San Soucci
4/18/03	10:40	0.600		71.10	LB	Eddy	Boat	U.S. from release, in area of inundated brush
4/19/03	10:35	0.600		71.00	LB	Eddy	Boat	U.S. from release, in area of inundated brush
4/22/03	10:00	0.600		71.00	LB	Eddy	Boat	U.S. from release, in area of inundated brush
4/24/03	10:45	0.600		71.00	LB	Eddy	Boat	U.S. from release, in area of inundated brush
4/29/03		0.600		70.95	LB	Eddy	Boat	Mid San Soucci bend
5/15/03	10:45	0.600		70.90	RB		Boat	San Soucci river bend
5/21/03	10:50	0.600		70.90	LB		Boat	Riverbend @ San Soucci
6/6/03	9:55	0.600		70.90	LB		Boat	San Soucci river bend
6/23/03	12:45	0.600		70.90	LB	Run	Boat	San Soucci river bend
7/9/03	16:10	0.600		70.50	LB	Run	Boat	Water main crossing D.S. San Soucci
7/24/03	13:25	0.600		70.90	LB	Glide	Boat	San Soucci riverbend, cobble/boulder
8/7/03	14:35	0.600		70.90	LB	Run	Boat	San Soucci riverbend, cobble/boulder
8/20/03	11:40	0.600		70.80		Glide		San Soucci riverbend, cobble/boulder
9/4/03	10:40	0.600		70.80		Glide		San Soucci riverbend, cobble/boulder
9/19/03		0.600		70.80				Tag on river bank, but not recovered
11/18/03		0.620	Old bridge Xing	72.33	RB	Eddy	Tagged	Release site
1/22/04	9:45	0.620		72.55	RB	Pool	Boat	RB at old bridge U.S. of Latah Creek
3/13/04		0.620		NA			Boat	Not Detected
3/18/04	10:05	0.620		72.40	RB	Riffle	Boat	At old bridge U.S. of Latah Ck.
3/24/04	10:35	0.620		72.40	RB	Riffle	Boat	At old bridge U.S. of Latah Ck.
3/30/04	10:45	0.620		72.41	RB	Eddy	Boat	At old bridge U.S. of Latah Ck.
4/5/04	12:15	0.620		72.41	RB	Eddy	Boat	At old bridge U.S. of Latah Ck.
4/9/04	9:50	0.620		72.50	RB	Eddy	Boat	100 ft D.S. of the old bridge U.S. of Latah Ck.
4/13/04	8:55	0.620		73.30	LB	Eddy	Boat	75 ft U.S. of put-in, behind inundated tree
4/16/04	13:30	0.620		72.50	RB	Glide	Boat	100 ft D.S. of old bridge
4/18/04	13:40	0.620		72.50	RB	Glide	Boat	At old bridge
4/23/04	9:55	0.620		72.50	RB	Glide	Boat	At old bridge
4/26/04	10:10	0.620		72.55	RB	Brush	Boat	RB willows @ old bridge
3/15/03	14:10	0.800	River Bend Bar	68.33	LB Island	Side channel	Tagged	Release site
3/18/03	16:57	0.800		68.35			Land-based	200 ft. D.S. of release site

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/2/03	14:55	0.800		68.35	LB Island	Side channel	Boat	River Bend Bar, adj. to island
4/4/03	11:25	0.800		68.40	LB Island	Side channel	Boat	Eddy behind River Bend Bar, near release
4/10/03	11:55	0.800		68.40	LB Island	Side channel	Boat	River Bend Bar
4/18/03		0.800		NA			Boat	Assumed Dead - Not detected through the monitoring period
3/14/03	17:15	1.000	Springs above T.J.M.Br.	69.93	RB Island	Eddy	Tagged	Release site
3/17/03		1.000		69.90			Land-based	U.S. of T.J.Meenach Bridge, near release site
4/2/03	14:50	1.000		NA			Boat	Not Detected
4/4/03	12:00	1.000		65.80	LB	Eddy	Boat	Eddy D.S. of Bowl & Pitcher
4/10/03	12:25	1.000		65.80	LB	Eddy	Boat	Eddy D.S. of Bowl & Pitcher
4/18/03	12:35	1.000		65.80	LB	Eddy	Boat	Eddy D.S. of Bowl & Pitcher
4/19/03	14:15	1.000		65.80	LB	Eddy	Boat	Eddy D.S. of Bowl & Pitcher
4/22/03	12:00	1.000		65.80	LB	Eddy	Boat	Eddy D.S. of Bowl & Pitcher
4/24/03	12:20	1.000		65.80	LB	Eddy	Boat	Eddy D.S. of Bowl & Pitcher
4/29/03		1.000		65.80	RB		Boat	At bend U.S. of Bowl & Pitcher
5/15/03	12:15	1.000		65.80	LB	Eddy	Boat	Reverse eddy D.S. of Bowl & Pitcher
5/21/03	12:35	1.000		65.80	LB	Eddy	Boat	Reverse eddy D.S. of Bowl & Pitcher
6/6/03	11:05	1.000		65.80	LB	Eddy	Boat	Reverse eddy D.S. of Bowl & Pitcher
6/23/03	13:55	1.000		65.80	LB	Eddy	Boat	Reverse eddy D.S. Bowl & Pitcher
7/9/03	15:25	1.000		65.80	LB	Eddy	Boat	Reverse eddy D.S. Bowl & Pitcher
7/24/03	12:35	1.000		65.80	LB	Pool	Boat	Eddy D.S. of Bowl & Pitcher
8/7/03	12:15	1.000		65.80	LB	Pool	Boat	Eddy D.S. of Bowl & Pitcher
8/20/03	13:05	1.000		65.80	LB	Pool		Pool D.S. Bowl and Pitcher
9/4/03	12:53	1.000		65.80	LB	Pool		Eddy/pool D.S. Bowl and Pitcher
9/19/03	11:30	1.000		65.80	LB	Pool		Eddy/pool D.S. Bowl and Pitcher
10/29/03	12:25	1.000		65.80	LB	Pool	Boat	Eddy/pool D.S. Bowl and Pitcher
1/22/04	12:25	1.000		65.80	LB	Pool	Boat	Eddy/pool D.S. Bowl and Pitcher
3/13/04		1.000		NA			Boat	Assumed Dead-No movement through monitoring period
11/18/03		1.300	Old bridge Xing	72.33	RB	Eddy	Tagged	Release site
1/22/04	10:55	1.300		68.40	LB	Pool	Boat	Riverbend Bar

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
3/13/04	11:30	1.300		68.45	LB	Pool	Boat	Left side of Riverbend Pool
3/18/04	12:10	1.300		68.45	LB	Pool	Boat	Left side of Riverbend Pool
3/24/04		1.300		68.45			Boat	Left side of Riverbend Pool
3/30/04	12:05	1.300		68.45	RB	Eddy	Boat	Upper Riverbend eddy
4/5/04	13:45	1.300		68.45	LB	Eddy	Boat	Upper Riverbend eddy
4/9/04	10:40	1.300		68.40	LB	Pool	Boat	Riverbend Bar pool
4/13/04	10:30	1.300		68.50	LB	Eddy	Boat	Riverbend pool
4/16/04	14:30	1.300		68.40	LB	Eddy	Boat	Riverbend pool
4/18/04	13:55	1.300		68.40		Pool	Boat	Riverbend pool
4/23/04	11:00	1.300		68.50	LB	Pool	Boat	Left side Riverbend pool
4/26/04	11:10	1.300		68.50	LB	Pool	Boat	Left side Riverbend pool
3/14/03	14:50	1.320	Upper San Soucci	71.32	RB	Eddy	Tagged	Release site
3/17/03		1.320		71.30			Land-based	U.S. of San Soucci
4/2/03	14:15	1.320		70.90	LB	Eddy	Boat	At San Soucci bend, U.S. of release site
4/4/03	10:37	1.320		71.00	LB	Brushy/Eddy	Boat	D.S. and opp. Release site about 200 yds U.S. San Soucci bend
4/10/03		1.320		71.10	LB	Brushy/Eddy	Boat	Mid San Soucci
4/18/03	10:35	1.320		71.10	LB	Brushy/Eddy	Boat	Mid San Soucci
4/19/03	10:35	1.320		71.10	LB	Brushy/Eddy	Boat	Mid San Soucci
4/22/03	10:00	1.320		71.10	LB	Brushy/Eddy	Boat	Mid San Soucci
4/24/03	10:35	1.320		71.10	LB	Brushy/Eddy	Boat	Mid San Soucci
4/29/03		1.320		71.10	LB	Brushy/Eddy	Boat	Mid San Soucci
5/15/03	10:45	1.320		71.20	LB		Boat	Mid San Soucci
5/21/03	10:55	1.320		70.60	LB		Boat	100 ft. U.S. of Water Main crossing
6/6/03	10:40	1.320		68.00	LB		Boat	Across from frisbee golf course
6/23/03	13:30	1.320		68.20	LB	Riffle	Boat	Riffle D.S. of Riverbend Bar
7/9/03	15:45	1.320		68.40	LB	Pool	Boat	Riverbend Bar
7/24/03		1.320		NA			Boat	Not Detected
8/7/03	15:20	1.320		68.10	RB	Riffle	Boat	Lower rapids D.S. of Riverbend Bar
8/20/03	12:35	1.320		68.30		Riffle		Rapids 100 ft D.S. Riverbend Bar
9/4/03	10:20	1.320		68.30		Riffle		Riffle D.S. Riverbend Bar

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
9/19/03	12:05	1.320		68.10		Riffle		Riffle D.S. Riverbend Bar
9/19/03	12:05	1.320		68.10		Riffle		Riffle D.S. Riverbend Bar
10/29/03	14:00	1.320		68.10		Riffle	Boat	Riffle D.S. Riverbend Bar
1/22/04	14:00	1.320		68.10		Riffle	Boat	Riffle D.S. Riverbend Bar
3/13/04	11:45	1.320		68.00	Mid	Run	Boat	Mid channel 1,000 ft D.S. Riverbend Bar
3/18/04	12:15	1.320		68.00	Mid	Run	Boat	Mid channel 1,000 ft D.S. Riverbend Bar
3/24/04		1.320		68.00			Boat	Mid channel 1,000 ft D.S. Riverbend Bar
3/30/04	12:15	1.320		68.00	Mid	Riffle	Boat	Mid channel 1,000 ft D.S. Riverbend Bar
4/5/04	14:00	1.320		68.00	RB	Riffle	Boat	Among brush D.S. of Riverbend Bar
4/9/04	10:50	1.320		68.00	LB	Brush	Boat	Among brush D.S. of Riverbend Bar
4/13/04	10:45	1.320		67.90	LB	Glide	Boat	100 ft U.S. riffle U.S. Treatment Plant
4/16/04	14:40	1.320		67.90	LB	Glide	Boat	100 ft U.S. riffle U.S. Treatment Plant
4/18/04	13:05	1.320		67.80	LB	Glide	Boat	200 ft U.S. riffle U.S. Treatment Plant
4/23/04	11:15	1.320		67.80	Mid	Glide	Boat	Mid-channel 300 ft U.S. riffle U.S. Treatment Plant
4/26/04	11:30	1.320		67.90	Mid	Glide	Boat	Mid-channel 100 ft U.S. riffle U.S. Treatment Plant
3/15/03	13:20	1.340	Upper River Bend	68.50	LB	Eddy	Tagged	Release site
3/18/03	16:54	1.340		68.45			Land-based	Near release site
4/2/03	14:55	1.340		68.35	LB Island	Side channel	Boat	River Bend Bar, adj. to island
4/4/03	11:21	1.340		68.48	LB	Large eddy	Boat	Upstream of island @ Big Bend
4/10/03	11:50	1.340		68.50	LB	Eddy	Boat	Riverbend Bar Eddy
4/18/03	12:00	1.340		68.30	LB	Eddy	Boat	Riverbend Bar
4/19/03	13:20	1.340		68.30	LB	Eddy	Boat	Riverbend Bar
4/22/03	11:30	1.340		68.30	LB	Eddy	Boat	Riverbend Bar
4/24/03	11:40	1.340		68.30	LB	Eddy	Boat	Riverbend Bar
4/29/03		1.340		68.46	LB	Eddy	Boat	Upper Riverbend Bar eddy
5/15/03	11:35	1.340		68.50	LB	Eddy	Boat	Upper Riverbend Bar eddy
5/21/03	11:55	1.340		68.40	LB		Boat	River bend @ San Soucci
6/6/03	10:30	1.340		68.40	LB	Eddy	Boat	Riverbend Bar eddy
6/23/03	13:25	1.340		68.40	RB	Pool	Boat	Across from Riverbend Bar
7/9/03	15:45	1.340		68.40	LB	Pool	Boat	Riverbend Bar
7/24/03	11:50	1.340		68.40	LB	Pool	Boat	Riverbend Bar

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
8/7/03	15:15	1.340		68.30	Mid	Riffle	Boat	Rapids D.S. of Riverbend Bar
8/20/03	12:35	1.340		68.50		Pool		Riverbend pool
9/4/03	10:20	1.340		68.50		Pool		Riverbend pool
9/19/03	12:15	1.340		68.40		Pool		Riverbend pool
10/29/03	13:45	1.340		68.40		Pool		Lower end of Riverbend Bar
1/22/04	13:45	1.340		68.40		Pool		Lower end of Riverbend Bar
3/13/04	11:40	1.340		68.33		Glide		Lower end of Riverbend Bar
3/18/04	12:10	1.340		68.33		Pool		Lower end of Riverbend Bar
3/24/04		1.340		68.33			Boat	Lower end of Riverbend Bar
3/30/04	12:10	1.340		68.34		Run	Boat	Lower end of Riverbend Bar, among brush
4/5/04		1.340		68.34		Run	Boat	Lower end of Riverbend Bar, among brush
4/9/04	10:45	1.340		68.30	LB	Brush	Boat	Lower end of Riverbend Bar, among brush
4/13/04	10:35	1.340		68.30	LB	Brush	Boat	Riverbend pool - lower bar
4/16/04	14:30	1.340		68.30	LB	Brush	Boat	Riverbend pool - lower bar
4/18/04	14:30	1.340		68.30	LB	Brush	Boat	Riverbend pool - lower bar
4/23/04	11:00	1.340		68.30	LB	Brush	Boat	Riverbend pool - lower bar
4/26/04	11:20	1.340		68.30	LB	Brush	Boat	Riverbend pool - lower bar
3/14/03	14:00	1.360	Opposite Latah Ck	72.03	RB	Eddy	Tagged	Release site
3/17/03		1.360		72.10			Land-based	300 ft. D.S. Latah Creek
4/3/03	11:25	1.360		71.00			Land-based	San Soucci area
4/4/03	11:00	1.360		69.90	LB		Boat	1000 ft. U.S. of island above T.J. Meenach Bridge
4/10/03		1.360		71.00	LB	Brushy Run	Boat	Mid San Soucci
4/18/03	10:35	1.360		71.40	LB	Brushy Run	Boat	Mid San Soucci
4/19/03	10:35	1.360		71.40	LB	Brushy Run	Boat	Mid San Soucci
4/22/03	9:45	1.360		71.40	LB	Brushy Run	Boat	Mid San Soucci
4/24/03	10:15	1.360		71.40	RB	Brushy Run	Boat	Mid San Soucci
4/29/03		1.360		71.50	RB	Brushy Run	Boat	Mid San Soucci
5/15/03	10:35	1.360		71.60	LB		Boat	Across from Upper San Soucci
5/21/03	10:35	1.360		71.50	LB		Boat	Upper San Soucci
6/6/03	9:45	1.360		71.60	RB		Boat	Upper San Soucci
6/23/03	13:00	1.360		69.90	RB	Riffle	Boat	1000 ft. U.S. T.J. Meenach Bridge

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
7/9/03		1.360		NA			Boat	Not Detected
7/24/03	11:20	1.360		70.00	RB	Riffle	Boat	T.J. Meenach Springs
8/7/03		1.360		NA			Boat	Not Detected
8/20/03		1.360		NA				Not Detected
9/4/03		1.360		NA				Not Detected
9/19/03	12:45	1.360		69.70		Riffle	Boat	RB riffle under T.J. Meenach Bridge
10/29/03	14:45	1.360		69.80		Riffle	Boat	100 ft U.S. of T.J. Meenach Bridge
1/22/04	14:45	1.360		69.80		Riffle	Boat	100 ft U.S. of T.J. Meenach Bridge
3/13/04		1.360		NA			Boat	Not Detected
3/18/04	11:10	1.360		69.77	LB	Run	Boat	Left channel under T.J. Meenach Br. (weak signal)
3/24/04	12:05	1.360		69.77	LB	Run	Boat	Left channel under T.J. Meenach Br. (weak signal)
3/30/04	11:45	1.360		69.73	LB	Run	Boat	Left channel, 50 ft D.S. T.J. Meenach Br. (weak signal)
4/5/04	13:30	1.360		69.75	LB	Run	Boat	Left channel, 50 ft D.S. T.J. Meenach Br. (weak signal)
4/9/04	10:25	1.360		69.75	LB	Run	Boat	Left channel, 50 ft D.S. T.J. Meenach Br.
4/13/04	10:10	1.360		69.65	LB		Boat	Left channel D.S. T.J. Meenach
4/16/04	14:10	1.360		69.65	LB	Brush	Boat	Left channel 100 ft D.S. T.J. Meenach
4/18/04	14:35	1.360		69.65	LB	Brush	Boat	Left channel D.S. T.J. Meenach
4/23/04	10:30	1.360		69.65	LB	Brush	Boat	70 ft D.S. of T.J. Meenach
4/26/04	10:55	1.360		69.60	LB	Riffle	Boat	Mid channel island 100 ft D.S. of TJ Meenach
3/14/03	16:30	1.380	Lower San Soucci	70.62	LB	Eddy	Tagged	Release site
3/17/03		1.380		70.60			Land-based	Between T.J.Meenach Bridge and San Soucci
4/2/03	14:15	1.380		70.80	LB	Eddy	Boat	At San Soucci river bend, U.S. of release site
4/4/03	10:46	1.380		70.94	LB	Eddy	Boat	At San Soucci river bend, U.S. of release site
4/10/03		1.380		70.90	RB		Boat	Mid San Soucci
4/18/03	10:40	1.380		71.00	LB		Boat	Lower San Soucci
4/19/03	10:35	1.380		70.90	LB		Boat	San Soucci river bend
4/22/03	10:05	1.380		70.90	LB		Boat	San Soucci river bend
4/24/03	10:50	1.380		70.90	RB		Boat	San Soucci river bend
4/29/03		1.380		70.96	RB		Boat	San Soucci river bend

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
5/15/03	10:50	1.380		70.90	RB		Boat	San Soucci river bend
5/21/03	10:50	1.380		70.90	RB		Boat	San Soucci river bend
6/6/03	9:55	1.380		70.90	LB		Boat	San Soucci river bend
6/23/03	12:45	1.380		70.90	RB	Run	Boat	San Soucci river bend
7/9/03	17:00	1.380		70.60	Mid	Riffle	Boat	Lower San Soucci
7/24/03	13:25	1.380		70.60	LB	Riffle	Boat	Lower San Soucci
8/7/03		1.380		NA			Boat	Not Detected
8/20/03		1.380		NA				Not Detected
9/4/03		1.380		NA				Not Detected
9/19/03	13:25	1.380		71.10		Glide	Boat	Mid San Soucci
10/29/03	15:15	1.380		71.00		Run	Boat	200 ft U.S. of San Soucci riverbend
1/22/04	15:15	1.380		71.00		Run	Boat	200 ft U.S. of San Soucci riverbend
3/13/04	10:30	1.380		70.95	LB	Run	Boat	San Soucci riverbend
3/18/04	10:35	1.380		70.90	RB	Eddy	Boat	San Soucci riverbend, along willows
3/24/04		1.380		70.90			Boat	Lower San Soucci
3/30/04	11:20	1.380		70.90	RB	Glide	Boat	Riverbend at San Soucci
4/5/04	13:00	1.380		70.90	RB	Glide	Boat	Riverbend at San Soucci
4/9/04	10:10	1.380		70.90	RB	Brush	Boat	San Soucci riverbend brush
4/13/04	9:45	1.380		70.90	RB	Brush	Boat	San Soucci riverbend brush
4/16/04	13:55	1.380		70.90	RB	Brush	Boat	San Soucci riverbend brush
4/18/04	13:55	1.380		70.90	LB	Brush	Boat	Upper riverbend @ San Soucci
4/23/04	10:25	1.380		70.90	RB	Brush	Boat	Riverbend @ San Soucci
4/26/04	10:40	1.380		70.85	RB	Brush	Boat	Riverbend @ San Soucci
3/14/03	17:25	1.400	Springs above T.J.M.Br.	69.93	Island	Eddy	Tagged	Release site
3/17/03		1.400		69.70			Land-based	At T.J.Meenach Bridge
4/2/03	14:40	1.400		69.60	RB	Eddy/Brush	Boat	Area of brush and trees near T.J.Meenach Br access ramp
4/4/03	11:06	1.400		69.65	RB	Brushy Run	Boat	About 600 ft. D.S. T.J.Meenach Br., near fish 1.720
4/10/03		1.400		69.60	RB	Brush/trees	Boat	Just D.S. of T.J.Meenach Br.
4/18/03	10:45	1.400		69.60	RB	Brushy Run	Boat	About 1000 ft. D.S. T.J.Meenach Br., near fish 1.720

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/19/03	13:00	1.400		69.60	RB	Brushy Run	Boat	About 1000 ft. D.S. T.J.Meenach Br., near fish 1.720
4/22/03	11:10	1.400		69.60	RB	Brushy Run	Boat	Near Is. D.S. T.J.M. Br.
4/24/03	11:15	1.400		69.60	RB	Brushy Run	Boat	1000 ft. D.S. T.J.Meenach Bridge
4/29/03		1.400		69.60	RB	Brushy Run	Boat	1000 ft. D.S. T.J.Meenach Bridge
5/15/03	11:15	1.400		69.60	RB	Brushy Run	Boat	1000 ft. D.S. T.J.Meenach Bridge
5/21/03	11:35	1.400		69.50	RB	Brushy Run	Boat	1000 ft. D.S. T.J.Meenach Bridge
6/6/03		1.400		NA			Boat	Not Detected
6/23/03	13:05	1.400		69.90	Mid	Riffle	Boat	1000 ft. D.S. T.J.Meenach Bridge
7/9/03	13:55	1.400		69.60		Glide	Boat	500 ft. D.S. T.J. Meenach Bridge
7/24/03	11:30	1.400		69.60	Mid	Run	Boat	300 ft. D.S. T.J. Meenach Bridge
8/7/03	14:55	1.400		69.30	Mid	Riffle	Boat	Rapids D.S. of last Is. D.S. of T.J. Meenach Bridge
8/20/03	11:10	1.400		69.50		Riffle		500 ft D.S. T.J. Meenach Br., 14C, cobble
9/4/03		1.400		69.50				Tag Recovered in streambed
3/14/03	15:15	1.420	Upper San Soucci	71.32	RB	Eddy	Tagged	Release site
3/18/03	16:25	1.420		70.00			Land-based	U.S. T.J.Meenach Bridge
4/2/03	14:15	1.420		70.90	LB	Eddy	Boat	At San Soucci bend, U.S. of release site
4/4/03	10:46	1.420		70.94	LB	Eddy	Boat	At San Soucci bend, D.S. & around bend from release site
4/10/03	12:10	1.420		66.80	RB		Boat	Rapids above Bowl & Pitcher
4/18/03	12:25	1.420		66.90	RB		Boat	500 ft. D.S. of Treatment Plant bridge
4/19/03	14:05	1.420		66.90	RB		Boat	500 ft. D.S. of Treatment Plant bridge
4/22/03	11:50	1.420		66.90	RB	Glide	Boat	U.S. of rapids below Treatment Plant
4/24/03	12:00	1.420		66.90	RB	Glide	Boat	U.S. of rapids below Treatment Plant
4/29/03		1.420		66.85	RB	Glide	Boat	U.S. of rapids below Treatment Plant
5/15/03	12:00	1.420		66.80	RB	Eddy	Boat	Eddy D.S. of Treatment Plant
5/21/03	12:15	1.420		66.90	RB		Boat	Across from Island D.S. of Treatment Plant
6/6/03	10:50	1.420		66.80	RB	Riffle	Boat	Riffle D.S. of Treatment Plant
6/23/03	13:45	1.420		66.90	RB	Riffle	Boat	Lower end of riffle D.S. Treatment Plant
7/9/03	13:35	1.420		66.80	RB	Riffle	Boat	Second riffle D.S. of Treatment Plant
7/24/03	12:20	1.420		67.00	RB	Riffle	Boat	First rapid D.S. Treatment Plant



## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
8/7/03	13:10	1.420		66.80	RB	Riffle	Boat	First rapid D.S. Treatment Plant
8/20/03	12:50	1.420		66.80		Riffle		700 ft D.S. Treatment Plant
9/4/03	14:25	1.420		66.80		Riffle		Riffle D.S. Treatment Plant
9/19/03	11:50	1.420		66.80		Riffle		Riffle D.S. Treatment Plant
10/29/03	13:10	1.420		66.80	NA	NA	Boat	Tag recovered from stream bank D.S. of Treatment Plant
3/14/03	12:45	1.440	Old bridge Xing	72.37	RB	Eddy	Tagged	Release site
3/17/03		1.440		70.60			Land-based	Between T.J.Meenach Br. and San Soucci
4/3/03	11:25	1.440		71.00			Land-based	San Soucci area
4/4/03	10:48	1.440		70.62	RB	Eddy	Boat	D.S. from release, just U.S. water main crossing
4/10/03		1.440		70.50	LB		Boat	Near old water main crossing, below San Soucci
4/18/03	10:45	1.440		70.50	LB		Boat	200 ft. D.S. water main crossing
4/19/03	11:40	1.440		70.50	LB		Boat	200 ft. D.S. water main crossing
4/22/03	10:15	1.440		70.50	LB		Boat	200 ft. D.S. water main crossing
4/24/03	11:00	1.440		70.50	LB		Boat	Water main crossing
4/29/03		1.440		70.55	LB		Boat	Water main crossing
5/15/03	10:55	1.440		70.40	LB		Boat	100 ft. D.S. of water main crossing
5/21/03	10:55	1.440		70.50	LB		Boat	Water main crossing D.S. of San Soucci
6/6/03	10:00	1.440		70.50	LB		Boat	Water main crossing D.S. of San Soucci
6/23/03	13:00	1.440		70.20	RB	Run	Boat	1000 ft. D.S. Water Main crossing
7/9/03	17:00	1.440		70.60	Mid	Glide	Boat	Lower San Soucci
7/24/03	11:00	1.440		70.40	Mid	Glide	Boat	Water main crossing D.S. San Soucci
8/7/03	14:40	1.440		70.40	LB	Run	Boat	Lower San Soucci
8/20/03		1.440		NA				Not Detected
9/4/03	10:45	1.440		70.30		Riffle		500 ft D.S. Water Main
9/19/03	13:10	1.440		70.50		Riffle		Riffle at Lower San Soucci
10/29/03	15:00	1.440		70.40		Riffle		Water Main crossing D.S. of San Soucci
1/22/04	15:00	1.440		70.40		Riffle		Water Main crossing D.S. of San Soucci
3/13/04	10:45	1.440		70.65	LB	Eddy	Boat	Lower San Soucci
3/18/04	10:45	1.440		70.70	LB	Eddy	Boat	Lower San Soucci
3/24/04		1.440		70.70			Boat	Lower San Soucci
3/30/04	11:30	1.440		70.57	LB	Eddy	Boat	70 ft D.S. of water main crossing, lower San Soucci

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/5/04	13:05	1.440		70.47	RB		Boat	150 ft D.S. of water main crossing, lower San Soucci
4/9/04	10:20	1.440		70.47	LB	Glide	Boat	100 ft D.S. of water main crossing, lower San Soucci
4/13/04	9:55	1.440		70.35	LB	Glide	Boat	LB riverbend 400 ft D.S. water main crossing
4/16/04	14:05	1.440		70.35	LB	Brush	Boat	LB riverbend 500 ft D.S. water main crossing
4/18/04	14:05	1.440		70.25	LB	Brush	Boat	LB riverbend 700 ft D.S. water main crossing
4/23/04	10:35	1.440		70.25	LB		Boat	LB riverbend 700 ft D.S. water main crossing
4/26/04	10:45	1.440		70.25	LB		Boat	LB along willows 600 ft D.S. water main crossing
3/14/03	13:05	1.460	Old bridge Xing	72.37	RB	Eddy	Tagged	Release site
3/17/03	15:39	1.460		72.40			Land-based	Near release site
4/2/03		1.460		70.90	LB	Eddy	Boat	At San Soucci bend, U.S. of release site
4/4/03		1.460		71.10	LB	Eddy	Land-based	U.S of San Soucci river bend
4/10/03		1.460		71.20	LB	Eddy	Boat	San Soucci eddy
4/18/03	10:30	1.460		71.40	LB	Eddy	Boat	Upper San Soucci
4/19/03	11:25	1.460		71.40	LB	Eddy	Boat	Upper San Soucci
4/22/03	9:50	1.460		71.40	LB	Brushy Run	Boat	Upper San Soucci
4/24/03	10:30	1.460		71.10	LB	Brushy/Eddy	Boat	Mid San Soucci
4/29/03		1.460		71.20	LB	Brushy/Eddy	Boat	Mid San Soucci
5/15/03	10:45	1.460		71.30	LB		Boat	Mid San Soucci
5/21/03	10:40	1.460		71.30	LB		Boat	Mid San Soucci
6/6/03	9:25	1.460		72.50	RB		Boat	Old bridge U.S. of Latah Creek
6/23/03	12:25	1.460		72.40	RB	Riffle	Boat	Old bridge U.S. Latah Creek
7/9/03		1.460		NA			Boat	Not Detected
7/24/03	10:05	1.460		72.40	RB	Riffle	Boat	At old bridge crossing U.S. Latah Creek
8/7/03	14:10	1.460		72.40	RB	Riffle	Boat	At old bridge crossing U.S. Latah Creek
8/20/03	10:30	1.460		72.50		Riffle		Old bridge crossing U.S. Latah Ck., boulder/cobble
9/4/03	9:30	1.460		72.50	LB	Riffle		Riffle/run @ old bridge U.S. Latah Ck., 9C
9/19/03	13:40	1.460		72.50	LB	Riffle		Riffle/run @ old bridge U.S. Latah Ck., 9C
10/29/03	16:00	1.460		72.50	LB	Riffle		Riffle/run @ old bridge U.S. Latah Ck., 9C
1/22/04	16:00	1.460		72.50	LB	Riffle		Riffle/run @ old bridge U.S. Latah Ck., 9C
3/13/04	9:25	1.460		72.41		Eddy	Boat	U.S. of old bridge U.S. Latah Ck., adjacent to

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
								rapids
3/18/04	10:00	1.460		72.40	RB	Eddy	Boat	D.S. of old bridge U.S. Latah Ck.
3/24/04		1.460		72.40			Boat	D.S. of old bridge U.S. Latah Ck.
3/30/04	10:45	1.460		72.41	RB	Eddy	Boat	D.S. of old bridge U.S. Latah Ck.
4/5/04	12:10	1.460		72.41	RB	Eddy	Boat	D.S. of old bridge U.S. Latah Ck.
4/9/04	9:50	1.460		72.60	RB	Eddy	Boat	At old bridge U.S. Latah Ck.
4/13/04	9:15	1.460		72.55	RB	Eddy	Boat	RB eddy @ old bridge U.S. Latah Creek
4/16/04	13:30	1.460		72.55	RB	Brush	Boat	RB willows @ old bridge U.S. Latah Creek
4/18/04	13:40	1.460		72.55	RB	Brush	Boat	RB willows @ old bridge U.S. Latah Creek
4/23/04	9:55	1.460		72.55	RB	Brush	Boat	RB willows @ old bridge U.S. Latah Creek
4/26/04	10:10	1.460		72.55	RB	Brush	Boat	RB willows @ old bridge U.S. Latah Creek
11/18/03		1.480	T.J. Meenach ramp	69.60	RB	Eddy	Tagged	Release site
1/22/04	11:20	1.480		67.00	RB	Riffle	Boat	Riffle 500 ft D.S. of Treatment Plant
3/13/04	13:30	1.480		66.06	LB	Eddy	Boat	D.S. of 1st riffle U.S. of Bowl and Pitcher
3/18/04		1.480		NA			Boat	Not Detected
3/24/04		1.480		NA			Boat	Not Detected
3/30/04	12:40	1.480		66.20	LB	Pool	Boat	Bowl and Pitcher pool
4/5/04	14:15	1.480		66.20	RB	Eddy	Boat	U.S. Bowl and Pitcher
4/9/04		1.480		NA			Boat	Not Detected
4/13/04	11:00	1.480		66.20		Eddy	Boat	LB US Bowl & Pitcher
4/16/04	15:05	1.480		66.20	LB	Eddy	Boat	LB US Bowl & Pitcher
4/18/04	15:20	1.480		66.20	LB	Eddy	Boat	LB US Bowl & Pitcher
4/23/04	11:30	1.480		66.20	LB	Eddy	Boat	LB US Bowl & Pitcher
4/26/04		1.480		66.20	LB	Eddy	Boat	LB US Bowl & Pitcher
3/14/03	16:25	1.500	Lower San Soucci	70.62	LB	Eddy	Tagged	Release site
4/2/03	14:15	1.500		70.90	LB	Eddy	Boat	At San Soucci bend, U.S. of release site
4/4/03	10:42	1.500		71.00	LB	Eddy	Boat	U.S end of San Soucci bend, U.S. of release site
4/10/03		1.500			RB	Eddy	Boat	San Soucci eddy
4/18/03	10:30	1.500		71.40	LB	Eddy	Boat	Upper San Soucci
4/19/03	10:40	1.500		71.00	RB		Boat	San Soucci river bend

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/22/03	10:05	1.500		71.00	RB		Boat	San Soucci river bend
4/24/03	10:50	1.500		71.00	RB		Boat	San Soucci river bend
4/29/03		1.500		70.90	RB		Boat	San Soucci river bend
5/15/03	10:50	1.500		70.90	RB		Boat	San Soucci river bend
5/21/03	10:50	1.500		70.90	RB		Boat	San Soucci river bend
6/6/03	9:55	1.500		70.90	LB		Boat	San Soucci river bend
6/23/03	12:45	1.500		71.00	RB	Run	Boat	San Soucci river bend
7/9/03	17:05	1.500		70.90	RB	Glide	Boat	San Soucci river bend
7/24/03	13:25	1.500		70.90	RB	Run	Boat	San Soucci river bend
8/7/03	14:35	1.500		70.90	RB	Run	Boat	San Soucci river bend
8/20/03	11:40	1.500		70.90		Glide		San Soucci river bend cobble/boulder
9/4/03	10:40	1.500		70.90		Glide		San Soucci river bend cobble/boulder
9/19/03	13:20	1.500		70.80		Glide		San Soucci river bend cobble/boulder
10/29/03	15:15	1.500		70.90		Glide		San Soucci river bend
1/22/04	15:15	1.500		70.90		Glide		Assumed dead-No movement through monitoring period
3/14/03	13:45	1.510	Opposite Latah Ck	72.03	RB	Eddy	Tagged	Release site
3/17/03		1.510		72.10			Land-based	300 ft. D.S. Latah Ck
4/3/03	12:15	1.510		72.00			Land-based	Near release site
4/4/03	10:20	1.510		71.92	LB		Boat	D.S. and opp. of release site, at bend below Latah Ck
4/10/03		1.510		71.92	LB	Eddy	Boat	Bend below Latah Ck
4/18/03	10:00	1.510		71.92	LB	Eddy	Boat	D.S. and opp. of release site, at bend below Latah Ck
4/19/03	10:25	1.510		72.00	LB	Eddy	Boat	D.S. and opp. of release site, at bend below Latah Ck
4/22/03	9:35	1.510		72.00	LB	Eddy	Boat	D.S. and opp. of release site, at bend below Latah Ck
4/24/03	10:10	1.510		72.00	LB	Eddy	Boat	D.S. and opp. of release site, at bend below Latah Ck
4/29/03		1.510		71.92	LB	Eddy	Boat	D.S. and opp. of release site, at bend below Latah Ck

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
5/15/03	10:20	1.510		72.40	RB		Boat	Old bridge crossing U.S. Latah Creek
5/21/03	10:15	1.510		71.60	RB		Boat	Upper San Soucci
6/6/03	9:45	1.510		71.60	LB		Boat	Upper San Soucci
6/23/03	12:35	1.510		71.80	LB	Riffle	Boat	Riverbend D.S. Latah Creek
7/9/03	16:15	1.510		71.50	Mid	Riffle	Boat	Upper San Soucci
7/24/03	10:00	1.510		71.90	LB	Glide	Boat	Riverbend D.S. Latah Creek
8/7/03	14:25	1.510		71.50	Mid	Riffle	Boat	Upper San Soucci
8/20/03	11:45	1.510		71.60		Riffle		Upper San Soucci midstream rapids
9/4/03	10:50	1.510		71.60		Riffle		Upper San Soucci rapids
9/19/03	13:25	1.510		71.60		Riffle		Upper San Soucci rapids
10/29/03	15:10	1.510		71.60		Riffle		Upper San Soucci rapids
1/22/04	15:10	1.510		71.60		Riffle		Upper San Soucci rapids
3/13/04	10:10	1.510		71.65	RB	Riffle	Boat	In willows D.S. of Latah Ck
3/18/04	10:20	1.510		71.70	Mid	Riffle	Boat	Mid channel in riffle in upper San Soucci
3/24/04	11:35	1.510		71.70	Mid		Boat	Mid channel in riffle in upper San Soucci
3/30/04	11:05	1.510		71.65	Mid	Riffle	Boat	Mid channel in riffle in upper San Soucci
4/5/04		1.510		NA			Boat	Assumed Dead-No movement through monitoring period
3/14/03	14:50	1.520	Upper San Soucci	71.32	RB	Eddy	Tagged	Release site
3/17/03		1.520		71.00			Land-based	At San Soucci
4/3/03	12:30	1.520		71.30			Land-based	Near release site
4/4/03	10:32	1.520		71.45	RB		Boat	Slightly U.S. of release, U.S. of San Soucci
4/10/03		1.520		71.50	RB		Boat	Upper San Soucci
4/18/03	10:10	1.520		71.45	LB		Boat	Upper San Soucci
4/19/03	10:30	1.520		71.40	RB		Boat	Upper San Soucci
4/22/03	9:50	1.520		71.40	LB		Boat	Upper San Soucci
4/24/03	10:15	1.520		71.40	LB		Boat	Upper San Soucci (weak signal)
4/29/03		1.520		71.68	LB		Boat	Upper San Soucci
5/15/03	10:10	1.520		73.50	LB		Boat	Maple Street
5/21/03	14:00	1.520		73.70	LB		Boat	Corbin Community Center
6/6/03		1.520		NA			Boat	Not Detected

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
6/23/03		1.520		NA			Boat	Not Detected
7/9/03		1.520		NA			Boat	Not Detected
7/24/03	12:15	1.520		67.60	Mid	Riffle	Boat	Rapids U.S. Treatment Plant
8/7/03	15:30	1.520		67.40	Mid	Run	Boat	Mid treatment Plant, run
8/20/03	12:50	1.520		67.40		Run		Mid Treatment Plant
9/4/03	14:30	1.520		67.40		Run		Mid Treatment Plant, cobble
9/19/03	10:50	1.520		64.70		Riffle		Riffle U.S. of Rifle Club
10/29/03		1.520		NA			Boat	Not Detected
1/22/04		1.520		NA			Boat	Not Detected
3/13/04	13:55	1.520		64.85	RB	Eddy	Boat	U.S. of Rifle Club
3/18/04	13:05	1.520		64.71	LB	Run	Boat	Across from the Rifle Club
3/24/04	13:10	1.520		64.71			Boat	Lower Rifle Club, U.S. of rapids
3/30/04	13:15	1.520		64.71	LB	Riffle	Boat	Lower Rifle Club, U.S. of rapids
4/5/04	14:32	1.520		64.67	RB	Riffle	Boat	Upper end of Rifle Club
4/9/04	11:25	1.520		64.50	RB	Eddy	Boat	Middle of Rifle Club rapids
4/13/04	11:20	1.520		64.15	LB	Eddy	Boat	Middle of Rifle Club rapids
4/16/04	15:25	1.520		64.05		Eddy	Boat	Middle of upper Rifle Club rapids
4/18/04	15:45	1.520		64.05		Eddy	Boat	Middle of upper Rifle Club rapids
4/23/04	11:55	1.520		64.05	LB	Eddy	Boat	Middle of Rifle Club rapids
4/26/04		1.520		64.05	LB	Eddy	Boat	Middle of Rifle Club rapids
11/18/03		1.570	T.J. Meenach ramp	69.60	RB	Eddy	Tagged	Release site
1/22/04		1.570		NA			Boat	Not Detected
3/13/04	11:30	1.570		68.45	RB	Pool	Boat	Upper Riverbend Bar pool
3/18/04		1.570		NA			Boat	Not Detected
3/24/04		1.570		NA			Boat	Not Detected
3/30/04	12:05	1.570		68.40		Pool	Boat	Upper Riverbend Bar
4/5/04	13:45	1.570		68.40	LB	Eddy	Boat	Upper Riverbend Bar eddy
4/9/04	10:40	1.570		68.40	LB	Glide	Boat	Upper Riverbend Bar eddy - Possibly spawning
4/13/04	10:30	1.570		68.40		Glide	Boat	Upper Riverbend Bar
4/16/04	14:25	1.570		68.40		Glide	Boat	Upper Riverbend Bar
4/18/04	13:50	1.570		68.40		Glide	Boat	US portion Riverbend Bar

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/23/04	11:00	1.570		68.40	LB	Pool	Boat	LB upper Riverbend Bar
4/26/04	11:15	1.570		68.40	Mid	Pool	Boat	Mid Riverbend pool
3/15/03	16:30	1.600	Below Bowl & Pitcher	65.65	LB	Eddy	Tagged	Release site
3/18/03	17:18	1.600		65.60			Land-based	Near release site
4/2/03	15:45	1.600		65.60	LB	Eddy	Boat	At bend below Bowl & Pitcher, at release site
4/4/03	12:00	1.600		65.60	LB	Eddy	Boat	At large bend between Devils Toenail and Bowl & Pitcher
4/10/03	12:35	1.600		65.40	RB	Eddy	Boat	Eddy above Devils Toenail
4/18/03	12:40	1.600		65.80	LB	Eddy	Boat	Eddy D.S. of Bowl & Pitcher
4/19/03	14:20	1.600		65.60	RB	Eddy	Boat	Eddy D.S. of Bowl & Pitcher
4/22/03	12:15	1.600		65.60	RB	Eddy	Boat	Eddy D.S. of Bowl & Pitcher
4/24/03	12:20	1.600		65.60	RB	Eddy	Boat	Eddy D.S. of Bowl & Pitcher
4/29/03		1.600		65.40	RB	Eddy	Boat	Eddy D.S. of Bowl & Pitcher
5/15/03	12:20	1.600		65.40	RB	Eddy	Boat	Head of eddy U.S. of Devils Toenail
5/21/03	12:40	1.600		65.50	RB	Eddy	Boat	Head of eddy D.S. of Bowl & Pitcher
6/6/03	11:15	1.600		65.50	RB	Eddy	Boat	Eddy U.S. of Devils Toenail
6/23/03	14:05	1.600		65.50	LB	Eddy	Boat	Eddy U.S. Devils Toenail
7/9/03	15:25	1.600		65.60	RB	Riffle	Boat	Head of rapids U.S. Devils Toenail
7/24/03	12:45	1.600		65.50	RB	Riffle	Boat	Rapids U.S. Devils Toenail
8/7/03	12:10	1.600		65.50	LB	Riffle	Boat	Rapids U.S. Devils Toenail
8/20/03	13:10	1.600		65.50		Riffle		Rapids between Bowl & Pitcher and Devil's Toenail
9/4/03	12:45	1.600		65.40		Run		Lower run U.S. Devils Toenail
9/19/03	11:10	1.600		65.50		Run		Upper run U.S. Devils Toenail, 15C
10/29/03	11:45	1.600		65.30	LB	Riffle/glide	Boat	Lower riffle U.S. Devils Toenail
1/22/04	11:45	1.600		65.30	LB	Riffle/glide	Boat	Lower riffle U.S. Devils Toenail
3/13/04	13:37	1.600		65.30	LB	Eddy	Boat	Between Bowl and Pitcher and Devils Toenail
3/18/04	12:55	1.600		65.45	LB	Riffle	Boat	Lower Rapids U.S. of Devils Toenail
3/24/04		1.600		65.45			Boat	Lower Rapids U.S. of Devils Toenail
3/30/04		1.600		65.45			Boat	Assumed Dead-No movement through monitoring period

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
11/18/03		1.610	Lower San Soucci	70.70	RB	Eddy	Tagged	Release site
1/22/04	10:00	1.610		71.80		Riffle	Boat	Head of rapids U.S. of upper San Soucci
3/13/04		1.610		NA			Boat	Not Detected
3/18/04	10:15	1.610		71.80	LB	Eddy	Boat	Riverbend D.S. of Latah Ck, in willows
3/24/04	11:35	1.610		71.80	LB	Eddy	Boat	Riverbend D.S. of Latah Ck, in willows
3/30/04	11:05	1.610		71.80	RB	Eddy	Boat	Riverbend D.S. of Latah Ck
4/5/04	12:45	1.610		71.80	RB	Eddy	Boat	Riverbend D.S. of Latah Ck
4/9/04	9:55	1.610		71.90	RB	Brush	Boat	Riverbend D.S. of Latah Ck
4/13/04	9:30	1.610		71.85	RB	Brush	Boat	Riverbend brush, D.S. Latah Creek
4/16/04	15:45	1.610		71.85	RB	Brush	Boat	Riverbend brush, D.S. Latah Creek
4/18/04	13:45	1.610		71.85	RB	Brush	Boat	Riverbend brush, D.S. Latah Creek
4/23/04	10:10	1.610		71.85	RB	Brush	Boat	Riverbend brush, D.S. Latah Creek
4/26/04	10:30	1.610		71.85	RB	Brush	Boat	Riverbend brush, D.S. Latah Creek
3/14/03	12:30	1.620	Old bridge Xing	72.37	RB	Eddy	Tagged	Release site
3/17/03	15:39	1.620		72.40			Land-based	Near release site
4/2/03	13:46	1.620		72.80	RB	Eddy	Boat	At USGS Gauge
4/4/03	9:55	1.620		72.94	LB	Eddy	Boat	Eddy 300 ft. U.S. USGS Gauge
4/10/03		1.620					Boat	In lower Latah Creek
4/18/03	10:00	1.620		72.20	LB	Eddy	Boat	Mouth of Latah Creek
4/19/03	16:00	1.620		72.20	LB	Eddy	Boat	Mouth of Latah Creek
4/22/03	9:30	1.620		72.20	LB	Eddy	Boat	Mouth of Latah Creek
4/24/03	10:15	1.620		72.20	LB	Eddy	Boat	U.S. edge of mouth of Latah Ck
4/29/03		1.620		72.45	LB	Eddy	Boat	Near old bridge abutments
5/15/03		1.620		NA			Boat	Not Detected
5/21/03		1.620		NA			Boat	Not Detected
6/6/03		1.620		NA			Boat	Not Detected
6/23/03	12:00	1.620		73.30	RB	Riffle	Boat	Riffle U.S. Maple Street put-in
7/9/03	16:40	1.620		73.60	RB	Riffle	Boat	Rapids D.S. Monroe St Dam
7/24/03	9:35	1.620		73.60	LB	Riffle	Boat	Rapids D.S. Monroe St Dam
8/7/03	11:20	1.620		73.60	LB	Riffle	Boat	Rapids D.S. Monroe St Dam
8/20/03	10:15	1.620		73.70		Riffle		Rapids D.S. Monroe St Dam



## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
9/4/03	9:05	1.620		73.70		Riffle		Riffle D.S. Monroe Street Dam
9/19/03	13:45	1.620		73.70		Riffle		Riffle D.S. Monroe Street Dam
10/29/03	16:20	1.620		73.70		Riffle		Riffle D.S. Monroe Street Dam
1/22/04	16:20	1.620		73.70		Riffle		Riffle D.S. Monroe Street Dam
3/13/04	8:55	1.620		73.34	RB	Run	Boat	Opposite Maple St. put-in ramp
3/18/04	9:40	1.620		73.30	RB		Boat	Upstream of Maple St put-in
3/24/04	9:45	1.620		73.30			Boat	Upstream of Maple St put-in
3/30/04		1.620		73.30			Boat	Upstream of Maple St put-in
4/5/04		1.620		73.30			Boat	Upstream of Maple St put-in
4/9/04	9:30	1.620		73.50			Boat	Under Maple Street Bridge
4/13/04		1.620		NA			Boat	Not Detected
4/16/04		1.620		NA			Boat	Not Detected
4/18/04		1.620		NA			Boat	Not Detected
4/23/04		1.620		NA			Boat	Not Detected
4/26/04		1.620		NA			Boat	Not Detected
11/18/03		1.630	Lower San Soucci	70.70	RB	Eddy	Tagged	Release site
1/22/04	10:30	1.630		70.20	RB	Riffle	Boat	RB, 300 ft U.S. T.J. Meenach Springs
3/13/04	10:40	1.630		70.65	RB	Eddy	Boat	Lower San Soucci
3/18/04	10:45	1.630		70.65	RB	Eddy	Boat	Lower San Soucci
3/24/04		1.630		NA			Boat	Not Detected
3/30/04	11:30	1.630		70.65	RB	Eddy	Boat	Lower San Soucci eddy
4/5/04	13:05	1.630		70.53	RB	Eddy	Boat	Lower San Soucci eddy
4/9/04	10:15	1.630		70.60	RB	Eddy	Boat	Lower San Soucci eddy
4/13/04	9:50	1.630		70.60	RB	Eddy	Boat	RB eddy @ lower San Soucci
4/16/04	16:00	1.630		70.60	RB	Eddy	Boat	RB eddy @ lower San Soucci - poss mvmt
4/18/04	14:00	1.630		70.60	RB	Brush	Boat	RB eddy @ lower San Soucci
4/23/04	10:30	1.630		70.60	RB	Brush	Boat	RB eddy @ lower San Soucci
4/26/04	10:45	1.630		70.60	RB	Brush	Boat	RB eddy @ lower San Soucci
3/14/03	11:55	1.640	USGS Gauge	72.70	RB	Eddy	Tagged	Release site
3/17/03	15:30	1.640		72.80		Eddy	Land-based	U.S. of release site
4/2/03	14:35	1.640		70.10	LB		Boat	At bend above T.J.Meenach Br

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/4/03	10:55	1.640		70.50	LB	Glide	Boat	300 yds D.S. of old bridge below San Soucci
4/10/03		1.640		70.30	LB		Boat	100 ft. D.S. of old bridge below San Soucci
4/18/03	10:45	1.640		70.50	LB		Boat	300 yds D.S. of old bridge below San Soucci
4/19/03	11:45	1.640		70.50	LB		Boat	300 yds D.S. of old bridge below San Soucci
4/22/03	11:00	1.640		70.10	RB		Boat	T.J Meenach Springs
4/24/03	11:00	1.640		70.40	RB		Boat	1000 ft. D.S. water main crossing
4/29/03		1.640		70.40	RB		Boat	1000 ft. D.S. water main crossing
5/15/03	11:05	1.640		70.10	RB		Boat	500 ft. U.S. of TJ Meenach springs
5/21/03	11:25	1.640		70.00	RB		Boat	U.S. of TJ Meenach Springs
6/6/03	10:05	1.640		70.10	LB		Boat	Across from TJ Meenach Springs
6/23/03	12:55	1.640		70.30	RB	Run	Boat	150 ft. D.S. of water main
7/9/03	16:05	1.640		70.10	LB	Riffle	Boat	T. J. Meenach Springs
7/24/03	11:05	1.640		70.30	RB	Glide	Boat	300 ft. D.S. water main crossing D.S. San Soucci
8/7/03	14:45	1.640		70.20	Mid	Riffle	Boat	Riffle 1,000 ft. D.S. water main crossing D.S. San Soucci
8/20/03	11:35	1.640		70.30		Riffle		500 ft D.S. Water main crossing D.S. San Soucci
9/4/03	10:30	1.640		70.30		Riffle		Midway between San Soucci - T. J. Meenach, cobble/bldr
9/19/03	13:00	1.640		70.30		Riffle		Head of rapids D.S. San Soucci
10/29/03	14:55	1.640		70.30	Mid	Riffle		Middle of riffle U.S. of T.J. Meenach Bridge
1/22/04	14:55	1.640		70.30	Mid	Riffle		Middle of riffle U.S. of T.J. Meenach Bridge
3/13/04	10:50	1.640		70.45	RB	Run	Boat	200 ft D.S. water main crossing, D.S. of San Soucci
3/18/04	10:50	1.640		70.45	Mid	Riffle	Boat	D.S. water main crossing, D.S. of San Soucci
3/24/04	11:15	1.640		70.45			Boat	D.S. water main crossing, D.S. of San Soucci
3/30/04	11:35	1.640		70.45	Mid	Riffle	Boat	D.S. water main crossing, D.S. of San Soucci
4/5/04		1.640		70.40	LB	Riffle	Boat	200 ft D.S. water main crossing, D.S. of San Soucci
4/9/04	10:20	1.640		70.20	LB	Brush	Boat	1,000 ft D.S. water main crossing, D.S. of San Soucci
4/13/04	9:55	1.640		70.20	LB	Brush	Boat	1,000 ft D.S. water main crossing, D.S. of San Soucci
4/16/04	14:05	1.640		70.20	LB	Brush	Boat	700 ft D.S. water main crossing, D.S. of San Soucci
4/18/04	14:05	1.640		70.20	LB	Brush	Boat	700 ft D.S. water main crossing, D.S. of San Soucci

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/23/04	10:35	1.640		70.20	LB	Brush	Boat	Riverbend D.S. water main crossing
4/26/04	10:45	1.640		70.20	LB	Brush	Boat	Riverbend 700 ft D.S. water main crossing
3/15/03	16:00	1.660	Below Bowl & Pitcher	65.65	LB	Eddy	Tagged	Release site
3/18/03	17:18	1.660		65.60			Land-based	Near release site
4/2/03	15:45	1.660		65.60	LB	Eddy	Boat	At bend below Bowl & Pitcher, at release site
4/4/03	12:00	1.660		65.60	RB	Eddy	Boat	At large bend between Devils Toenail and Bowl & Pitcher
4/10/03	12:40	1.660		65.60	RB	Eddy	Boat	Eddy above Devils Toenail
4/18/03	12:45	1.660		65.60	RB	Eddy	Boat	At large bend between Devils Toenail and Bowl & Pitcher
4/19/03	14:20	1.660		65.60	RB	Eddy	Boat	At large bend between Devils Toenail and Bowl & Pitcher
4/22/03	12:15	1.660		65.60	LB	Riffle	Boat	Riffle above Devils Toenail
4/24/03	12:20	1.660		65.60	LB	Riffle	Boat	Riffle above Devils Toenail
4/29/03		1.660		65.65	RB	Riffle	Boat	Riffle above Devils Toenail
5/15/03	12:20	1.660		65.40	LB		Boat	Across river from eddy U.S. of Devils Toenail
5/21/03	12:40	1.660		65.40	LB		Boat	Across from eddy U.S. of Devils Toenail
6/6/03	11:15	1.660		65.40	LB		Boat	Across from eddy U.S. Devils Toenail
6/23/03	14:00	1.660		65.50	LB	Riffle	Boat	Rapids U.S. Devils Toenail
7/9/03	15:20	1.660		65.60	RB	Eddy	Boat	Mid eddy U.S. of Devils Toenail
7/24/03	12:45	1.660		65.40	LB	Riffle	Boat	Lower rapids U.S. Devils Toenail
8/7/03	12:10	1.660		65.40	LB	Riffle	Boat	D.S. end of lower rapids U.S. Devils Toenail
8/20/03	13:10	1.660		65.30		Run		Mid run U.S. Devils Toenail
9/4/03	12:50	1.660		65.30		Run		Mid run U.S. Devils Toenail
9/19/03	11:15	1.660		65.30		Run		Mid run U.S. Devils Toenail
10/29/03	11:35	1.660		65.30	LB	Riffle/glide		Lower riffle U.S. Devils Toenail
1/22/04	11:35	1.660		65.30	LB	Riffle/glide		Lower riffle U.S. Devils Toenail
3/13/04	13:40	1.660		65.40			Boat	Assumed Dead-No movement through monitoring period
11/18/03		1.670	D.S. Pleasant Valley Put-in	73.10	LB	Eddy	Tagged	Release site
1/22/04	9:35	1.670		73.10	LB	Run	Boat	LB at riverbend D.S. of Pleasant Valley put-in

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
3/13/04	9:00	1.670		73.20	LB	Run	Boat	LB D.S. of Pleasant Valley put-in
3/18/04	9:45	1.670		73.13	RB	Eddy	Boat	Across from Pleasant Valley put-in, in willows
3/24/04	10:15	1.670		73.00			Boat	D.S. from Pleasant Valley put-in
3/30/04	10:35	1.670		73.08	RB	Brush	Boat	Brush, downstream of Peaceful Valley spawning area
4/5/04	12:00	1.670		73.10	RB	Brush	Boat	Brush, at Peaceful Valley spawning area
4/9/04	9:40	1.670		73.00	RB	Brush	Boat	Brush, at lower Peaceful Valley spawning area
4/13/04	9:05	1.670		73.05	RB	Brush	Boat	RB brush spawning area in Peaceful Valley
4/16/04	13:25	1.670		73.00	RB	Brush	Boat	RB lower Peaceful Valley spawning area
4/18/04	13:35	1.670		73.00	RB	Brush	Boat	200 ft D.S. Peaceful Valley spawning area
4/23/04	9:45	1.670		73.00	RB	Brush	Boat	150 ft D.S. Peaceful Valley spawning area
4/26/04	9:55	1.670		73.00	RB	Brush	Boat	100 ft D.S. Peaceful Valley spawning area
3/15/03	17:00	1.680	Below Bowl & Pitcher	65.65	LB	Eddy	Tagged	Release site
4/2/03	16:15	1.680		64.18	RB	Glide	Boat	Just D.S. Rifle Club, above rapids
4/4/03	12:30	1.680		64.20	LB	Riffle	Boat	Upper Rifle Club rapids
4/10/03		1.680		64.10	RB	Riffle	Boat	Head of Rifle Club rapids
4/18/03	13:00	1.680		64.00	RB	Riffle	Boat	Upper Rifle Club rapids
4/19/03	14:40	1.680		64.00	RB	Riffle	Boat	Upper Rifle Club rapids
4/22/03	12:25	1.680		64.00	RB	Glide	Boat	100 ft. U.S. Rifle Club rapids
4/24/03	12:30	1.680		64.00	RB	Glide	Boat	100 ft. U.S. Rifle Club rapids
4/29/03		1.680		64.00	RB	Glide	Boat	100 ft. U.S. Rifle Club rapids
5/15/03	12:35	1.680		64.10	RB	Glide	Boat	50 ft. U.S. of Rifle Club rapids
5/21/03	13:00	1.680		64.20	RB	Riffle	Boat	Head of rapids D.S. of Rifle Club
6/6/03	11:35	1.680		64.20	RB	Riffle	Boat	Head of Rifle Club rapids
6/23/03	14:35	1.680		64.20	RB	Riffle	Boat	Head of Rifle Club rapids
7/9/03	15:00	1.680		64.20	RB	Glide	Boat	50 ft. U.S. Rifle Club rapids
7/24/03	13:00	1.680		64.20	RB	Glide	Boat	U.S. of Rifle Club rapids
8/7/03	12:00	1.680		64.20	RB	Riffle	Boat	Immediately U.S. of Rifle Club rapids
8/20/03	13:20	1.680		64.10		Riffle		Upper Rifle Club rapids
9/4/03	12:40	1.680		64.10		Riffle		Mid-channel Rifle Club rapids, cobble/boulder
9/19/03	22:40	1.680		64.20	RB	Riffle		Rifle Club rapids, cobble/boulder

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
10/29/03	10:55	1.680		64.00	RB	Glide		Upper Rifle Club rapids
1/22/04	10:55	1.680		64.00	RB	Glide		Upper Rifle Club rapids
3/13/04	13:57	1.680		64.20		Run	Boat	U.S. of rapids D.S. of Rifle Club
3/18/04		1.680		NA			Boat	Assumed Dead-No movement through monitoring period
3/15/03	13:30	1.700	Upper River Bend	68.50	LB	Eddy	Tagged	Release site
3/18/03	16:50	1.700		68.35			Land-based	Near release site
4/2/03	14:50	1.700		68.35	RB of channel	Side chan.	Boat	River Bend Bar, adj. to island
4/4/03	11:23	1.700		68.48	LB	Eddy	Boat	U.S. end of Big Bend Bar area, near fish 1.340
4/10/03	11:25	1.700		69.60	Mid	Eddy	Boat	Island below T.J. Meenach Br
4/18/03	11:35	1.700		70.00	LB	Eddy	Boat	1000 ft. U.S. of T.J. Meenach Bridge
4/19/03	12:55	1.700		70.10	RB		Boat	T.J Meenach Springs
4/22/03	11:00	1.700		70.10	RB		Boat	T.J Meenach Springs
4/24/03	11:15	1.700		70.10	RB		Boat	200 ft. D.S. T.J Meenach Springs
4/29/03		1.700		70.12	LB		Boat	200 ft. D.S. T.J Meenach Springs
5/15/03	11:30	1.700		68.80	LB		Boat	300 ft. U.S. of last pumphouse D.S. of T.J. Meenach Br.
5/21/03	11:45	1.700		69.00	RB		Boat	Across from upper pump house D.S. T.J. Meenach Br.
6/6/03	10:25	1.700		68.80	LB		Boat	Last pump house D.S. of T.J. Meenach Bridge
6/23/03	13:15	1.700		68.60	LB	Run	Boat	U.S. of riffle U.S. Riverbend Bar
7/9/03		1.700		NA	NA		Boat	Not Detected
7/24/03	12:00	1.700		68.60	RB	Run	Boat	500 ft. U.S. Riverbend Bar pool
8/7/03	15:05	1.700		68.60	LB	Riffle	Boat	Rapids U.S. Riverbend Bar pool
8/20/03	12:30	1.700		68.60		Riffle		700 ft U.S. Riverbend Bar
9/4/03	10:50	1.700		68.60		Riffle		Riffle U.S. Riverbend Bar, cobble
9/19/03	12:25	1.700		68.60		Riffle		Riffle U.S. Riverbend Bar, cobble
10/29/03	14:05	1.700		68.60		Riffle		Riffle U.S. Riverbend Bar
1/22/04	14:05	1.700		68.60		Riffle		Riffle U.S. Riverbend Bar
3/13/04	11:20	1.700		68.69	LB	Riffle	Boat	Riffle U.S. Riverbend Bar
3/18/04	12:00	1.700		68.69	LB	Run	Boat	U.S. of Riffle U.S. Riverbend Bar

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
3/24/04	12:20	1.700		68.69			Boat	U.S. of Riffle U.S. Riverbend Bar
3/30/04	12:00	1.700		68.65		Riffle	Boat	Riffle U.S. Riverbend Bar
4/5/04	13:40	1.700		68.65	LB	Riffle	Boat	Riffle U.S. Riverbend Bar
4/9/04	10:35	1.700		68.70	LB	Brush	Boat	Head of riffle U.S. Riverbend Bar
4/13/04		1.700		68.70	LB	Brush	Boat	Head of riffle U.S. Riverbend Bar
4/16/04	14:20	1.700		68.70	LB	Brush	Boat	Head of riffle U.S. Riverbend Bar
4/18/04	14:45	1.700		68.70	Mid	Riffle	Boat	Mid river, at head of riffle U.S. Riverbend pool
4/23/04	10:55	1.700		68.70	LB	Brush	Boat	Brush along upper riffle U.S. Riverbend
4/26/04	11:05	1.700		68.70	LB	Brush	Boat	Brush along upper riffle U.S. Riverbend
11/18/03		1.710	Old bridge Xing	72.33	RB	Eddy	Tagged	Release site
1/22/04		1.710		72.50	LB	Pool	Boat	At old bridge crossing U.S. of Latah Creek
3/13/04		1.710		NA			Boat	Not Detected
3/18/04	10:05	1.710		72.37	RB	Eddy	Boat	50 ft D.S. of old bridge U.S. of Latah Ck
3/24/04	10:40	1.710		72.37			Boat	At old bridge U.S. of Latah Ck
3/30/04	10:45	1.710		72.37	RB	Glide	Boat	100 ft D.S. of old bridge U.S. of Latah Ck
4/5/04	12:10	1.710		72.37	RB	Glide	Boat	100 ft D.S. of old bridge U.S. of Latah Ck
4/9/04	9:50	1.710		72.60	RB	Eddy	Boat	At old bridge U.S. of Latah Ck
4/13/04	9:15	1.710		72.55	RB	Eddy	Boat	RB eddy @ old bridge US Latah Creek
4/16/04	13:20	1.710		73.20	LB	Brush	Boat	LB Peaceful Valley spawning area
4/18/04		1.710		NA			Boat	Not Detected
4/23/04	9:45	1.710		73.20	LB	Eddy	Boat	100 ft D.S. of Maple Steet put-in
4/26/04	9:45	1.710		73.20	LB	Eddy	Boat	300 ft D.S. of Maple Steet put-in
3/15/03	13:10	1.720	Upper River Bend	68.50	LB	Eddy	Tagged	Release site
3/18/03	16:30	1.720		69.40			Land-based	300 ft. D.S. T.J.Meenach Bridge Access
4/2/03	14:43	1.720		69.35	RB		Boat	Just around corner from T.J.Meenach Br. Access
4/4/03	11:06	1.720		69.65	RB	Brush/trees	Boat	600 ft D.S. T.J. Meenach Bridge
4/10/03	11:30	1.720		69.40	RB	Brush/trees	Boat	Below T.J.Meenach Bridge
4/18/03	11:40	1.720		69.60	Mid	Eddy	Boat	Behind island below T.J. Meenach Bridge
4/19/03	13:00	1.720		69.60	LB	Eddy	Boat	D.S. last island below T.J. Meenach Bridge
4/22/03	11:10	1.720		70.10	RB		Boat	T.J. Meenach Springs
4/24/03	11:20	1.720		69.60	Mid		Boat	D.S. last Is. D.S. T.J. Meenach Bridge

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/29/03		1.720		69.60	LB		Boat	D.S. last Is. D.S. T.J. Meenach Bridge
5/15/03	11:15	1.720		69.60	LB		Boat	1000 ft. D.S. of T.J. Meenach Bridge
5/21/03	11:35	1.720		69.50	LB		Boat	Across from last island D.S. T.J. Meenach Bridge
6/6/03	10:15	1.720		69.60	RB		Boat	500 ft. D.S. of T.J. Meenach Bridge
6/23/03	13:05	1.720		69.80	RB	Riffle	Boat	500 ft. U.S. T.J. Meenach Bridge
7/9/03	15:50	1.720		69.50	Mid	Glide	Boat	D.S. lower island, D.S. T.J. Meenach Br.
7/24/03	11:30	1.720		69.50	Mid	Run	Boat	100 ft U.S. last island D.S. T.J. Meenach Br., cobble
8/7/03	14:55	1.720		69.50	Mid	Run	Boat	100 ft U.S. last island D.S. T.J. Meenach Br., cobble
8/20/03	11:00	1.720		69.50		Glide		100 ft U.S. last island D.S. T.J. Meenach Br., cobble
9/4/03	10:15	1.720		69.50		Run		100 ft U.S. last island D.S. T.J. Meenach Br., cobble
9/19/03	12:40	1.720		69.50	LB	Run		Last island D.S. T.J. Meenach Br., cobble
10/29/03	14:20	1.720		69.50	LB	Run		Last island D.S. T.J. Meenach Br., cobble
1/22/04	14:20	1.720		69.50	LB	Run		Last island D.S. T.J. Meenach Br., cobble
3/13/04	11:05	1.720		69.50			Boat	Tag on shore, but not recovered
3/15/03	13:35	1.740	Upper River Bend	68.50	LB	Eddy	Tagged	Release site
3/18/03	16:40	1.740		68.45			Land-based	200 ft. U.S. of release site
4/2/03	15:00	1.740		68.10	LB	Glide	Boat	Downstream end of River Bend curve
4/4/03	11:05	1.740		69.70	RB	Brush/trees	Boat	100 yds D.S. T.J. Meenach Br.
4/10/03	11:45	1.740		68.60	LB	Eddy	Boat	Eddy above River Bend
4/18/03	11:45	1.740		69.50	LB	Riffle	Boat	Head of rapids D.S. of T.J. Meenach Br.
4/19/03	13:00	1.740		69.60	LB	Riffle	Boat	500 ft. U.S. rapids D.S. of T.J. Meenach Br.
4/22/03	11:15	1.740		69.60	LB	Riffle	Boat	300 ft. D.S. last Is. D.S. T.J. Meenach Br.
4/24/03	11:20	1.740		69.60	LB	Riffle	Boat	200 ft. U.S. of rapids D.S. T.J. Meenach Br.
4/29/03		1.740		69.52	LB	Riffle	Boat	Just U.S. of rapids D.S. T.J. Meenach Br.
5/15/03	11:20	1.740		69.40	LB	Riffle	Boat	Head of rapids D.S. of T.J. Meenach Br.
5/21/03	11:40	1.740		69.40	LB	Riffle	Boat	Head of rapids D.S. of T.J. Meenach Br.
6/6/03	10:17	1.740		69.40	LB	Riffle	Boat	100 ft. U.S. of rapids D.S. of T.J. Meenach Br.
6/23/03	13:07	1.740		69.50	LB	Run	Boat	200 ft. U.S. last island D.S. T.J. Meenach Br.

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
7/9/03	15:50	1.740		69.50	Mld	Glide	Boat	D.S. lower island D.S. T.J. Meenach Br.
7/24/03	11:30	1.740		69.50	Mld	Run	Boat	500 ft. D.S. T.J. Meenach Br.
8/7/03	14:50	1.740		69.60	RB	Run	Boat	1000 ft. D.S. T.J. Meenach Br.
8/20/03	11:05	1.740		69.50		Glide		At last island D.S. T.J. Meenach Bridge
9/4/03	10:00	1.740		69.40		Run		50 ft D.S. last island D.S. T.J. Meenach, cobble/bldr 13C
9/19/03	12:35	1.740		69.30		Run		D.S. last island D.S. T.J. Meenach
10/29/03	14:15	1.740		69.40		Glide		U.S. of rapids, D.S. last island D.S. T.J. Meenach
1/22/04	14:15	1.740		69.40		Glide		U.S. of rapids, D.S. last island D.S. T.J. Meenach
3/13/04	11:10	1.740		69.40			Boat	Tag on shore, but not recovered
3/15/03	15:00	1.760	Treatment Plant	67.20	LB	Eddy	Tagged	Release site
3/18/03	17:15	1.760		65.80		Eddy	Land-based	Below Bowl & Pitcher
4/2/03	16:30	1.760		63.75	LB	Glide	Boat	U.S. of bend above Plese Flats
4/4/03		1.760					Boat	Not Detected
4/10/03	12:40	1.760		63.50			Boat	Below Devils Toenail
4/18/03	11:40	1.760		69.70	RB	Brush/Trees	Boat	D.S. of T.J. Meenach Br.
4/19/03	12:55	1.760		69.70	RB	Brush/Trees	Boat	D.S. of T.J. Meenach Br.
4/22/03	11:00	1.760		70.10	RB	Brush/Trees	Boat	T.J Meenach Springs
4/24/03	11:10	1.760		70.10	RB	Brush/Trees	Boat	T.J Meenach Springs
4/29/03		1.760		69.68	RB	Brush/Trees	Boat	200 ft. D.S. of T.J Meenach Br.
5/15/03		1.760		NA			Boat	Not Detected
5/21/03		1.760		NA			Boat	Not Detected
6/6/03		1.760		NA			Boat	Not Detected
6/23/03		1.760		NA			Boat	Not Detected
7/9/03		1.760		NA			Boat	Weak signal did not locate
7/24/03		1.760		NA			Boat	Assumed Dead-Not detected through monitoring period
3/15/03	14:15	1.780	River Bend Bar	68.33	Island	Side chan.	Tagged	Release site
3/18/03	16:50	1.780		68.35			Land-based	Near release site
4/2/03		1.780		68.30		Eddy	Boat	D.S. end of River Bend Bar, near release site
4/4/03	11:26	1.780		68.37	LB	Side chan.	Boat	Eddy behind Big Bend Bar, near release
4/10/03		1.780		71.50	RB		Boat	Upper San Soucci



## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/18/03	9:45	1.780		72.50	RB	Eddy	Boat	Bridge pier U.S. of Latah Ck
4/19/03	10:10	1.780		72.50	RB	Eddy	Boat	Bridge pier U.S. of Latah Ck
4/22/03	9:40	1.780		71.40	RB		Boat	Upper San Soucci
4/24/03	10:15	1.780		71.40	RB		Boat	Upper San Soucci
4/29/03		1.780		71.55	RB		Boat	Upper San Soucci
5/15/03	11:35	1.780		68.50	LB		Boat	River Bend bar
5/21/03	11:55	1.780		68.20	LB	Riffle	Boat	Head of rapids D.S. of River Bend Bar
6/6/03		1.780		NA			Boat	Assumed Dead-Not detected through monitoring period
3/15/03	15:40	1.800	Treatment Plant	67.20	LB	Eddy	Tagged	Release site
3/18/03	17:00	1.800		67.20			Land-based	Near release site
4/2/03	14:35	1.800		70.13	LB		Boat	At bend above T.J.Meenach Br
4/4/03	10:45	1.800		70.95			Boat	At San Soucci bend
4/10/03	9:50	1.800		73.20		Eddy	Boat	Maple St put in
4/18/03	9:30	1.800		73.50	LB		Boat	Under Maple St. Bridge
4/19/03	8:30	1.800		73.50	LB		Boat	Under Maple St. Bridge
4/22/03	8:00	1.800		73.50	LB		Boat	200 ft. U.S. Maple St. Bridge
4/24/03	8:15	1.800		73.50	LB		Boat	300 ft. U.S. Maple St. Bridge
4/29/03		1.800		73.53	LB		Boat	300 ft. U.S. Maple St. Bridge
5/15/03	11:40	1.800		68.20	LB	Eddy	Boat	Eddy along rapids D.S. of River Bend bar
5/21/03	12:10	1.800		67.30	LB		Boat	At Treatment Plant
6/6/03	10:45	1.800		67.30	LB		Boat	400 ft. U.S. of Treatment Plant Bridge
6/23/03		1.800		NA			Boat	Not Detected
7/9/03	15:40	1.800		67.20	LB	Run	Boat	200 ft. U.S. Treatment Plant Bridge
7/24/03	12:20	1.800		67.40	LB	Run	Boat	Mid Treatment Plant reach
8/7/03	15:30	1.800		67.40	Mld	Run	Boat	200 ft D.S. of Treatment Plant outfall
8/20/03	12:50	1.800		67.40		Run		200 ft D.S. Treatment discharge
9/4/03		1.800		NA				Not Detected
9/19/03		1.800		NA				Not Detected
10/29/03		1.800		NA				Not Detected
1/22/04		1.800		NA				Not Detected
3/13/04		1.800		NA			Boat	Tag Recovered across from the Treatment Plant

## Appendix C – Track Summaries (continued)

**Table C-1. 2003-04 Spokane River Fish Tracking (Lower River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
3/15/03	16:30	1.890	Below Bowl & Pitcher	65.65	LB	Eddy	Tagged	Release site
3/18/03	17:15	1.890		65.60		Eddy	Land-based	Near release site
4/2/03	15:45	1.890		65.60	RB	Eddy	Boat	At bend below Bowl & Pitcher, opp. Fish 1.600 & 1.660
4/4/03	12:10	1.890		65.60	RB	Eddy	Boat	Eddy above Devils Toenail
4/10/03		1.890		65.40		Eddy	Boat	Eddy above Devils Toenail
4/18/03	12:45	1.890		65.60	RB	Eddy	Boat	Eddy above Devils Toenail
4/19/03	14:25	1.890		65.60	RB	Eddy	Boat	Eddy above Devils Toenail
4/22/03	12:10	1.890		65.60	RB	Eddy	Boat	Eddy above Devils Toenail
4/24/03	12:20	1.890		65.60	RB	Eddy	Boat	Eddy above Devils Toenail
4/29/03		1.890		65.40	LB	Run	Boat	D.S. of Eddy U.S. of Devil Toenail
5/15/03	12:20	1.890		65.40	RB	Eddy	Boat	Eddy U.S. of Devils Toenail
5/21/03	12:40	1.890		65.50	RB	Eddy	Boat	Eddy U.S. of Devils Toenail
6/6/03	11:15	1.890		65.40	LB	Run	Boat	Across from eddy U.S. of Devils Toenail
6/23/03	14:00	1.890		65.50	RB	Eddy	Boat	Head of eddy U.S. Devils Toenail
7/9/03	15:20	1.890		65.60	RB	Eddy	Boat	Mid eddy U.S. of Devils Toenail
7/24/03	12:45	1.890		65.40	LB	Riffle	Boat	Rapids U.S. Devils Toenail
8/7/03	12:10	1.890		65.40	RB	Riffle	Boat	Rapids U.S. Devils Toenail
8/20/03	13:10	1.890		65.40		Run		Upper run U.S. Devils Toenail
9/4/03	12:50	1.890		65.40		Run		Mid run U.S. Devils Toenail
9/19/03	11:15	1.890		65.40		Riffle		Lower riffle U.S. Devils Toenail
10/29/03	12:10	1.890		65.40	RB	Eddy		Eddy U.S. of Devils Toenail
1/22/04	12:10	1.890		65.40	RB	Eddy		Assumed Dead-No movement through monitoring period

## APPENDIX C

### Fish Tracking Summaries

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
11/20/03		0.110	D.S. McGuire	100.70		Eddy	Tagged	Released
1/17/04	9:20	0.110		100.70	LB	Pool	Boat	Head of RB pool D.S. of McGuire crossing
3/12/04	NA	0.110		NA	NA		Boat	Not detected
3/17/04	9:30	0.110		100.77	LB	Eddy	Boat	Eddy across from Post Falls powerhouse
3/25/04	9:35	0.110		100.77		Pool	Boat	Post Falls powerhouse south channel, 50 ft D.S. of powerhouse
3/29/04	9:45	0.110		100.87			Boat	In north channel at Post Falls HED
4/8/04	9:40	0.110		100.75	Mid	Pool	Boat	Middle of the south channel, 400 ft D.S. of Post Falls HED
4/14/04	9:40	0.110		100.55			Boat	Confluence of N. and S. Channels, D.S. Post Falls
4/19/04	9:40	0.110		100.70			Boat	North Channel at Post Falls
6/11/04	9:30	0.110		100.70	RB	Riffle	Boat	Eddy along riffle D.S. McGuire
6/25/04	9:50	0.110		100.70	LB	Riffle	Boat	Mid riffle 200 ft U.S. bedrock
3/12/03	11:15	0.180	RB 1200 ft D.S. Harvard Rd.	91.52	RB	Eddy	Tagged	Released
3/17/03	10:53	0.180		91.52	RB	Glide	Land-based	Near release loc.
4/3/03	16:03	0.180		91.52			Land-based	Near release site
4/8/03	13:15	0.180		91.37	LB	Eddy	Boat	Just U.S. of power lines above Barker Rd
4/16/03	12:45	0.180		91.37	LB	Eddy	Boat	Just U.S. of power lines above Barker Rd
4/21/03	15:05	0.180		91.37	LB	Eddy	Boat	Just U.S. of power lines above Barker Rd
5/7/03	12:00	0.180		91.30	RB		Boat	300 ft U.S. of powerlines at Meyers Rd
5/21/03	13:00	0.180		91.30	RB		Boat	Across from eddy U.S. of Powerlines
6/7/03	11:08	0.180		91.30		Eddy	Land-based	Eddy U.S. of Powerlines U.S. Barker
6/27/03	11:30	0.180		91.40	NA	Riffle	Land-based	Riffle U.S. of powerlines U.S. Barker
7/8/03	15:35	0.180		91.60		Riffle	Land-based	Rapids D.S. of Centennial Tr. Mile 5
7/23/03	8:00	0.180		91.70		Riffle	Land-based	Rapids U.S. of Powerlines, U.S. Barker Road

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
8/5/03	13:55	0.180		91.60		Riffle	Land-based	Riffle U.S. Powerlines, U.S. Barker Road
8/21/03	12:10	0.180		91.30		Riffle	Land-based	1000 ft U.S. Powerlines U.S. Barker, temp 24C
9/3/03	NA	0.180		91.30		Riffle	Land-based	Tag recovered from the river
3/12/03	10:20	0.210	RB 1000 ft D.S. Harvard Rd.	91.72	RB	Eddy	Tagged	Released
3/17/03	10:30	0.210		91.73	RB	Run/Eddy	Land-based	Opp. Cent. Trail mi 5, near release site
4/3/03	15:50	0.210		91.73			Land-based	
4/8/03	13:05	0.210		91.52	LB	Run	Boat	Near Centennial Trail mi. 5
4/16/03	12:40	0.210		91.52	LB	Eddy	Boat	D.S of small point near Centennial Trail mi. 5
4/21/03	15:05	0.210		91.90	LB	Eddy	Boat	D.S of small point near Centennial Trail mi. 5
5/7/03	11:55	0.210		92.00	LB	Eddy	Boat	Brushy eddy by Cent Trail Mile 5
5/21/03	12:50	0.210		91.70	LB	Eddy	Boat	Eddy near Cent Trail Mile 5
6/7/03	11:05	0.210		91.70			Land-based	Centennial Tr Mile 5
6/27/03	11:25	0.210		91.80	NA	Glide	Land-based	Centennial Tr mile 5
7/8/03	15:25	0.210		91.80		Riffle	Land-based	Rapids 300 ft U.S. of Centennial Tr Mile 5
7/23/03	NA	0.210		NA	NA		Land-based	Not detected
8/5/03	NA	0.210		NA	NA		Land-based	Not detected
8/21/03	NA	0.210		NA	NA		Land-based	Not detected
9/3/03	NA	0.210		NA	NA		Land-based	Not detected
9/19/03	NA	0.210		NA	NA		Land-based	Not detected
10/27/03	NA	0.210		NA	NA		Boat	Not detected
3/12/04	9:20	0.210		99.55	LB	Pool	Boat	Lower McGuire Pool
3/17/04	9:55	0.210		99.51	RB	Pool	Boat	U.S. Corbin Park
3/25/04	NA	0.210		99.51			Boat	Tag Recovered on shore U.S. of Corbin Park
11/20/03		0.280	U.S. Stateline	96.80		Eddy	Tagged	Released
1/17/04	15:10	0.280		86.30	RB	Run	Boat	U.S. of Mirabeau Pool
3/12/04	12:20	0.280		88.66	RB	Eddy	Boat	Flora Rapids

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
3/17/04	12:55	0.280		88.66	RB	Eddy	Boat	Flora Rapids, by inundated veg.
3/25/04	12:45	0.280		88.65	LB	Riffle	Boat	Flora Rapids
3/29/04	12:20	0.280		91.10	LB	Glide	Boat	500 ft D.S. of powerlines U.S. of Barker Road
4/8/04	11:25	0.280		94.10	RB	Eddy	Boat	100 ft D.S. of Simpson Bar
4/14/04	12:15	0.280		88.70	RB	Eddy	Boat	RB eddy along Flora Rapids
4/19/04	13:00	0.280		88.70	RB	Eddy	Boat	RB eddy along Flora Rapids
6/11/04	13:25	0.280		86.10	RB	Eddy	Boat	Mirabeau Pool
6/25/04		0.280		NA			Boat	Not detected
3/12/03	10:10	0.300	LB 700 ft D.S. Harvard Rd.	91.97	LB	Eddy	Tagged	Released
3/17/03	10:10	0.300		92.10	LB	Riffle/Run	Land-based	D.S. of riffle below Harvard Road
4/3/03	15:50	0.300		91.98			Land-based	Near release site
4/8/03	13:05	0.300		91.61	LB	Run	Boat	Near Centennial Trail mi. 5
4/16/03	12:35	0.300		92.05	LB	Eddy	Boat	Around large bend D.S. Harvard Road
4/21/03	15:00	0.300		92.05	LB	Eddy	Boat	Around large bend D.S. Harvard Road
5/7/03	11:50	0.300		92.10	RB		Boat	River bend D.S. of Harvard Road
5/21/03	12:45	0.300		91.90	LB		Boat	500 ft D.S. of river bend D.S. Harvard Road
6/7/03	11:15	0.300		91.90			Land-based	300 ft D.S. of riverbend D.S. Harvard Road
6/27/03	11:05	0.300		92.10	NA	Run	Land-based	D.S. end of riverbend D.S. Harvard Road
7/8/03	15:20	0.300		92.00		Run	Land-based	Riverbend D.S. Harvard Road
7/23/03	8:10	0.300		92.00		Riffle	Land-based	Riffle D.S. of riverbend, D.S. of Harvard Road
8/5/03	13:45	0.300		92.00		Riffle	Land-based	Riffle D.S. of riverbend, D.S. of Harvard Road
8/21/03	16:00	0.300		92.00		Glide	Land-based	500 ft D.S. riverbend D.S. Harvard, cobble/bldr
9/3/03	17:50	0.300		92.00		Riffle	Land-based	Tag recovered from the river
11/20/03		0.300	U.S. Stateline	96.80		Eddy	Tagged	Released
3/12/04		0.300		86.29		Pool	Boat	In Mirabeau Pool area
3/17/04	13:25	0.300		86.30		Pool	Boat	Lower Mirabeau Pool, along bedrock wall

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
3/25/04		0.300		86.30			Boat	Weak signal in Mirabeau Pool
3/29/04	13:05	0.300		86.28	LB	Pool	Boat	Weak signal in Mirabeau Pool, along LB
4/8/04		0.300		86.90	LB	Pool	Boat	1000 ft D.S. of RXR bridge D.S. of Sullivan Road
4/14/04	12:35	0.300		87.05	LB		Boat	300 ft D.S. RXR bridge, D.S. Sullivan Road
4/19/04	13:15	0.300		87.00	LB	Glide	Boat	300 ft D.S. RXR bridge, D.S. Sullivan Road
6/11/04	13:00	0.300		89.70	LB	Riffle	Boat	Upper Flora rapids
6/25/04		0.300		NA			Boat	Not detected
11/20/03		0.310	U.S. Jacklin Seed	97.80		Eddy	Tagged	Released
1/17/04	10:20	0.310		97.30	LB	Riffle	Boat	LB riffle D.S. of Jacklin Seed
3/12/04		0.310		97.20	LB	Eddy	Boat	LB riffle D.S. of Jacklin Seed
3/17/04	10:40	0.310		97.20	LB	Eddy	Boat	LB riffle D.S. of Jacklin Seed
3/25/04	11:05	0.310		97.20	LB	Eddy	Boat	No movement from previous survey
3/29/04		0.310		97.20			Boat	No movement from previous survey
4/8/04	10:35	0.310		97.20	LB	Riffle	Boat	Lower riffle D.S. of Jacklin Seed
4/14/04	10:30	0.310		97.20	LB	Glide	Boat	Lower riffle D.S. Jacklin Seed
4/19/04	11:15	0.310		97.20	LB	Glide	Boat	Lower riffle D.S. Jacklin Seed
6/11/04	10:40	0.310		97.20	LB	Glide	Boat	Lower riffle D.S. Jacklin Seed
6/25/04		0.310		97.20	LB		Boat	Tag recovered at lower riffle D.S. Jacklin Seed
3/12/03	9:00	0.320	LB 400 ft D.S. Harvard Rd.	92.25	LB	Eddy	Tagged	Released
3/17/03	10:00	0.320		92.63	LB	Riffle/Run	Land-based	300 ft D.S. of Harvard Road
4/3/03	15:31	0.320		93.52			Land-based	Near Is. D.S. of USGS Gauge
4/8/03	12:45	0.320		92.70	RB	Eddy/Bar	Boat	Harvard Bar
4/16/03	12:20	0.320		92.70	RB	Eddy/Bar	Boat	Harvard Bar
4/21/03	14:55	0.320		92.70	RB	Eddy/Bar	Boat	Harvard Bar
5/7/03	10:15	0.320		97.00	LB		Boat	Riverbend U.S. of Stateline
5/21/03	12:25	0.320		92.60	LB		Boat	300 ft D.S. Harvard Bridge

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
6/7/03	9:20	0.320		84.70	RB		Land-based	Upper Plantes Ferry bedrock outcrop
6/27/03	10:20	0.320		93.00	NA	Glide	Land-based	1000 ft U.S. Harvard Bridge
7/8/03	NA	0.320		NA			Land-based	Not detected
7/23/03	8:30	0.320		93.00		Glide	Land-based	lower end of glide U.S. Harvard Bridge
8/5/03	13:20	0.320		93.00		Glide	Land-based	1000' U.S. Harvard Bridge
8/21/03	15:35	0.320		92.90		Glide	Land-based	100 ft U.S. rapids U.S. Harvard Road, cobble
9/3/03	17:30	0.320		92.90		Glide	Land-based	500 ft U.S. rapids U.S. Harvard Road, cobble/boulder
9/19/03	NA	0.320		92.90			Land-based	Recovered @ base of utility pole US Harv.
3/12/03	9:45	0.340	LB 600 ft D.S. Harvard Rd.	92.05	LB	Eddy	Tagged	Released
3/17/03	10:44	0.340		91.89	LB	Riffle/Run	Land-based	200 ft D.S. of release loc.
4/3/03	15:50	0.340		91.95	LB		Land-based	Just U.S. of release site
4/8/03	11:55	0.340		94.65	Mid-Chan	Bar	Boat	Starr Road bar
4/16/03	12:35	0.340		92.05	LB	Eddy	Boat	Around large bend D.S. Harvard Road
4/21/03	14:55	0.340		92.05	LB	Eddy	Boat	Around large bend D.S. Harvard Road
5/7/03	11:50	0.340		92.10	LB		Boat	River bend D.S. of Harvard Road
5/21/03	12:30	0.340		92.10			Boat	River bend D.S. of Harvard Road
6/7/03	11:20	0.340		92.10			Land-based	River bend D.S. of Harvard Road
6/27/03	11:05	0.340		92.10	NA	Run	Land-based	River bend D.S. of Harvard Road
7/8/03	15:10	0.340		92.10		Run	Land-based	River bend D.S. of Harvard Road
7/23/03	8:20	0.340		92.20		Run	Land-based	River bend D.S. of Harvard Road
8/5/03	13:40	0.340		92.10		Glide	Land-based	River bend D.S. of Harvard Road
8/21/03	16:00	0.340		92.10		Glide	Land-based	Riverbend D.S. Harvard, 24C, cobble/bldr
9/3/03	17:45	0.340		92.10		Run	Land-based	D.S. of riverbend D.S. Harvard cobble/boulder
9/19/03	9:50	0.340		92.10		Run	Land-based	D.S. of riverbend D.S. Harvard cobble/boulder
10/27/03	12:30	0.340		92.10		Run	Land-based	D.S. of riverbend D.S. Harvard cobble/boulder

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
3/12/04	NA	0.340		91.90		Run	Boat	Assumed Dead-No movement through monitoring period
3/11/03	13:16	0.350	LB U.S. of Harvard Rd	93.43	LB	Eddy	Tagged	Released
3/16/03	17:00	0.350		93.55	LB	Glide	Boat	Along Is. U.S. of Harvard Road
4/3/03	15:31	0.350		93.44			Land-based	D.S. of Is. D.S. of USGS Gauge, near release site
4/8/03	12:37	0.350		93.49	Mid-Chan	Bar	Boat	D.S. of Is. Between gauge and Harvard Road
4/16/03	12:07	0.350		93.52	LB	Bar	Boat	D.S. end of Is. Between gauge and Harvard Road
4/21/03	14:40	0.350		93.50	LB	Eddy	Boat	D.S. end of Is. Between gauge and Harvard Road
5/7/03	11:40	0.350		93.40	LB		Boat	400 ft D.S. of Island D.S. of USGS gauge
5/21/03	14:35	0.350		93.50	LB		Boat	100 ft D.S. I-90 Island
6/7/03	11:40	0.350		93.50			Land-based	300 ft D.S. of I-90 Island
6/27/03	12:35	0.350		88.00	NA	Run	Land-based	500 ft U.S. Sullivan Road Bridge
7/8/03	18:55	0.350		87.70		Riffle	Land-based	50 ft D.S. Sullivan Road Bridge
7/23/03	6:45	0.350		87.80		Run	Land-based	300 ft U.S. Sullivan Road in springs
8/5/03	15:35	0.350		87.60		Run	Land-based	Powerlines D.S. Sullivan Road
8/21/03	9:55	0.350		87.60		Run	Land-based	200 ft D.S. Sullivan Road, 14C, boulder/cbbl
9/3/03	12:00	0.350		87.60		Run	Land-based	500 ft D.S. Sullivan Road, boulder
9/19/03	10:40	0.350		87.60		Riffle	Land-based	200 ft D.S. Sullivan Road, boulder
10/27/03	13:10	0.350		87.60		Riffle	Land-based	400 ft D.S. Sullivan Road
1/17/04	15:25	0.350		87.60		Pool	Boat	200 ft D.S. Sullivan Road
3/12/04	12:38	0.350		87.63	Mid	Riffle	Boat	Assumed dead-No movement through monitoring period
3/11/03	13:45	0.360	RB U.S. of Harvard Rd	93.41	RB	Eddy	Tagged	Released
3/16/03	17:00	0.360		93.52	LB	Glide	Boat	Along Is. U.S. of Harvard Road
4/3/03	15:32	0.360		93.44			Land-based	D.S. of Is. D.S. of USGS Gauge, near release site



## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/8/03	12:38	0.360		93.38	Mid-Chan	Bar	Boat	D.S. of Is. Between gauge and Harvard Road
4/16/03	12:15	0.360		93.15	LB	Glide	Boat	Between Harvard Road and upstream Island
4/21/03	14:40	0.360		93.40	LB	Eddy	Boat	D.S. Is. Below Gauge, U.S. Harvard Road
5/7/03	11:40	0.360		93.40	LB		Boat	500 ft D.S. of Island D.S. of USGS guage
5/21/03	14:35	0.360		93.70	RB		Boat	Upper end of I-90 Island
6/7/03	11:40	0.360		93.40			Land-based	400 ft D.S. of I-90 Island
6/27/03	10:30	0.360		93.40	NA	Glide	Land-based	300 ft D.S. I-90 Island
7/8/03	19:00	0.360		87.90		Run	Land-based	700 ft U.S. Sullivan Bridge
7/23/03	6:45	0.360		87.80		Run	Land-based	300 ft U.S. Sullivan Bridge, in springs
8/5/03	15:40	0.360		87.80		Glide	Land-based	200 ft US Sullivan Bridge
8/21/03	15:40	0.360		93.00			Land-based	Signal seemed to come from south of river
9/3/03	NA	0.360		NA	NA		Land-based	Not detected
9/19/03	NA	0.360		NA	NA		Land-based	Not detected
10/27/03		0.360		93.60		Run	Land-based	200 ft D.S. USGS gauge
3/12/04	11:15	0.360		93.25	LB	Run	Boat	Weak signal U.S. of Harvard Road
3/17/04	11:45	0.360		93.25	LB	Run	Boat	Weak signal U.S. of Harvard Road
3/25/04	NA	0.360		93.25			Boat	Weak signal D.S. of riverbend D.S. of Harvard Road
3/29/04	NA	0.360		NA	NA		Boat	Not detected
4/8/04	NA	0.360		NA			Boat	Weak signal D.S. of Island U.S. of Harvard Road
4/14/04	NA	0.360		NA	NA		Boat	Not detected
4/19/04	NA	0.360		NA	NA		Boat	Not detected
6/11/04	11:45	0.360		93.60			Boat	Weak signal near island U.S. Harvard
6/25/04	13:20	0.360		93.60			Boat	Weak signal near island U.S. Harvard
3/12/03	9:25	0.370	LB 500 ft D.S. Harvard Rd.	92.15	LB	Eddy	Tagged	Released
3/17/03	10:59	0.370		91.24	LB	Glide	Land-based	At bend U.S. Barker Road , 300 ft U.S. of Cent. Tr. mi 6

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/3/03	16:10	0.370		91.24	LB		Land-based	About 1/2 mi D.S. of release site
4/8/03	13:20	0.370		91.25	RB	Eddy	Boat	At power lines above Barker Road
4/16/03	12:49	0.370		91.24	LB	Glide	Boat	200 ft D.S. of power lines above Barker Road
4/21/03	15:10	0.370		91.10	RB		Boat	At power lines above Barker Road
5/7/03	12:00	0.370		91.20	RB		Boat	200 ft D.S. of powerlines at Meyers Road
5/21/03	18:00	0.370		91.20	RB		Boat	At powerlines U.S. Barker Road
6/7/03	10:50	0.370		91.10			Land-based	300 ft D.S. powerlines U.S. Barker Road
6/27/03	16:10	0.370		91.20	NA	Glide	Land-based	100 ft D.S. powerlines U.S. Barker
7/8/03	NA	0.370		NA			Land-based	Not detected
7/23/03	7:55	0.370		91.30		Glide	Land-based	Powerlines U.S. Barker
8/5/03	14:00	0.370		91.20		Glide	Land-based	200' DS powerlines US Barker
8/21/03	12:00	0.370		91.20		Glide	Land-based	300 ft D.S. powerlines U.S. Barker, cobble
9/3/03	NA	0.370		91.20		Glide	Land-based	Tag recovered on shore
3/11/03	12:32	0.380	LB D.S. of Starr Rd Bar	94.65	LB	Eddy	Tagged	Released
3/16/03	16:35	0.380		94.50	LB	Glide	Boat	Adjacent to monument on Cent. Trail
4/3/03	15:05	0.380		94.60	RB	Eddy	Land-based	Just D.S. Starr Road Bar
4/8/03	11:55	0.380		94.68	RB	Eddy	Boat	Lower end of Starr Road. Bar
4/16/03	11:42	0.380		94.65	LB	Run/Eddy	Boat	300 ft D.S of Starr Road bar
4/21/03	14:15	0.380		94.65	LB	Run/Eddy	Boat	300 ft D.S of Starr Road bar
5/7/03	12:00	0.380		91.20	RB		Boat	200 ft U.S. of powerlines at Meyers Road
5/21/03	18:00	0.380		91.20	RB		Boat	At powerlines U.S. Barker Road
6/7/03	11:00	0.380		91.30			Land-based	200 ft U.S. of powerlines U.S. Barker Road
6/27/03	18:30	0.380		86.30	NA	Run	Land-based	U.S. Mirabeau Point Eddy
7/8/03	18:30	0.380		86.40		Glide	Land-based	1000 ft U.S. Mirabeau Point Eddy
7/23/03	10:05	0.380		86.40		Glide	Land-based	300 ft U.S. Mirabeau Point Eddy
8/5/03	14:50	0.380		86.40		Glide	Land-based	1500 ft U.S. Mirabeau Pool, temp 12C
8/21/03	9:25	0.380		86.30		Glide	Land-based	600 ft U.S. Mirabeau Pool, boulder, springs
9/3/03	11:45	0.380		86.40		Run	Land-based	1000 ft U.S. Mirabeau Pool, 13C, boulder

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
9/19/03	11:05	0.380		86.50		Riffle	Land-based	1000 ft U.S. Mirabeau Pool
10/27/03	13:25	0.380		86.30		Run	Boat	500 ft U.S. Mirabeau Pool
1/17/04	15:10	0.380		86.40		Run	Boat	U.S. Mirabeau Pool
3/12/04	12:45	0.380		86.52	RB	Riffle	Boat	U.S. Mirabeau Pool
3/17/04	13:20	0.380		86.52	LB	Run	Boat	U.S. Mirabeau Pool
3/25/04	13:05	0.380		86.56	RB	Glide	Boat	1000 ft U.S. Mirabeau Pool
3/29/04	13:05	0.380		86.51	RB	Run/Riffle	Boat	Middle of run U.S. Mirabeau Pool
4/8/04	12:55	0.380		86.40	RB	Glide	Boat	700 ft U.S. of Mirabeau Pool
4/14/04	12:40	0.380		86.30	LB	Glide	Boat	500 ft D.S. of riffle, U.S. Mirabeau
4/19/04	13:20	0.380		86.30	RB	Glide	Boat	300 ft U.S. Mirabeau pool
6/11/04	13:25	0.380		86.10		Pool	Boat	Mirabeau pool
6/25/04	15:10	0.380		86.10	RB	Pool	Boat	RB upper Mirabeau pool
3/10/03	17:35	0.390	LB D.S. of Starr Rd Bar	94.15	LB	Eddy	Tagged	Released
3/16/03	16:40	0.390		94.20	RB	Eddy	Boat	Near bar D.S. of monument on Cent. Trail
4/3/03	15:15	0.390		94.22			Land-based	Near release site
4/8/03	12:15	0.390		94.22	RB	Eddy	Boat	Large point and bar below Starr Road
4/16/03	11:55	0.390		94.23	RB	Eddy	Boat	Large point and bar below Starr Road
4/21/03	14:20	0.390		94.30	RB	Eddy	Boat	Behind Simpson Road bar
5/7/03	11:10	0.390		94.70	LB		Boat	Across river from Starr Road Bar
5/21/03	11:35	0.390		94.50	RB		Boat	D.S. Starr Road Bar
6/7/03	12:05	0.390		94.60			Land-based	100 ft D.S. of Starr Road Bar
6/27/03	12:20	0.390		86.30	NA	Run	Land-based	700 ft U.S. of Mirabeau Point Eddy
7/8/03	18:30	0.390		86.40		Glide	Land-based	1000 ft U.S. of Mirabeau Point Eddy
7/23/03	9:55	0.390		86.50		Run	Land-based	500 ft U.S. Mirabeau Point Eddy
8/5/03	15:30	0.390		86.80		Riffle	Land-based	Rapids near Centennial Trail mile marker 10
8/21/03	9:30	0.390		86.30		Glide	Land-based	700 ft U.S. Mirabeau Pool, boulder/cbbl, springs
9/3/03	11:45	0.390		86.40		Run	Land-based	120 ft' U.S. Mirabeau Pool, boulder
9/19/03	NA	0.390		NA			Land-based	Not Detected

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
10/27/03	NA	0.390		NA			Boat	Not Detected
3/12/04	NA	0.390		NA			Boat	Not Detected
3/17/04	NA	0.390		NA			Boat	Not Detected
3/25/04	NA	0.390		NA			Boat	Weak signal near Post Falls powerhouse, no location determined
3/29/04	9:30	0.390		NA			Boat	Weak signal near Post Falls powerhouse, no location determined
4/8/04	NA	0.390		NA			Boat	Weak signal near Post Falls powerhouse, no location determined
4/14/04	NA	0.390		NA			Boat	Not detected
4/19/04	9:35	0.390		NA			Boat	Weak signal south of river, no location determined
6/11/04		0.390		NA			Boat	Not detected
6/25/04		0.390		NA			Boat	Not detected
3/10/03	16:30	0.400	LB D.S. of Starr Rd Bar	94.58	LB	Eddy	Tagged	Released
3/16/03	16:10	0.400		94.70	LB	Bar	Boat	Starr Road Bar
4/3/03	15:33	0.400		93.52			Land-based	Near Is. D.S. of USGS Gauge
4/8/03	12:35	0.400		93.63	LB	Eddy	Boat	Top end of island below Gauge Sta., on mainstem side
4/16/03	12:15	0.400		93.15	LB	Eddy	Boat	Between Harvard Road and upstream Island
4/21/03	14:35	0.400		93.70	LB		Boat	Above Is. D.S. of Gauge
5/7/03	11:40	0.400		93.50	LB		Boat	600 ft D.S. of Island D.S. of USGS guage
5/21/03	11:45	0.400		93.50	LB		Boat	I-90 Island
6/7/03	11:20	0.400		92.00			Land-based	Riverbend D.S. of Harvard Road
6/27/03	11:15	0.400		92.00	NA	Run	Land-based	500 ft D.S. riverbend D.S. Harvard Bridge
7/8/03	15:10	0.400		92.40		Riffle	Land-based	Rapids D.S. Harvard Bridge
7/23/03	8:20	0.400		92.20		Run	Land-based	Riverbend D.S. of Harvard Road
8/5/03	13:45	0.400		92.00		Glide	Land-based	Glide DS riverbend DS Harvard Bridge
8/21/03	16:00	0.400		92.00		Glide	Land-based	Assumed Dead-No movement through

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
								monitoring period
3/10/03	14:20	0.410	LB at I-90 rest area	95.45	LB	Eddy	Tagged	Released
3/16/03	16:40	0.410		94.20	RB	Eddy	Boat	Near bar D.S. of monument on Cent. Trail
4/3/03	15:17	0.410		94.00	LB	Glide	Land-based	400 ft U.S. USGS Gauge
4/8/03	12:15	0.410		94.22	RB	Eddy	Boat	Large point and bar below Starr Rd
4/16/03	11:57	0.410		94.23	RB	Eddy	Boat	Large point and bar below Starr Rd
4/21/03	14:25	0.410		94.20	RB	Eddy	Boat	200 ft D.S. Simpson Road Bar
5/7/03	11:25	0.410		93.50	RB		Boat	1000 ft U.S. of USGS guage
5/21/03	11:40	0.410		94.10	RB		Boat	D.S. Simpson Bar
6/7/03	11:50	0.410		94.00			Land-based	1000 ft D.S. of Simpson Bar
6/27/03	10:40	0.410		94.10	NA	Glide	Land-based	500 ft D.S. Simpson Bar
7/8/03	NA	0.410		NA			Land-based	Not detected
7/23/03	8:45	0.410		94.10		Glide	Land-based	200 ft D.S. of Simpson Bar
8/5/03	12:20	0.410		94.00		Run	Land-based	750 ft DS Simpson Bar
8/21/03	14:45	0.410		94.00		Glide	Land-based	Assumed Dead-No movement through monitoring period
3/11/03	11:05	0.420	LB near bend U.S. of I-90	96.62	LB	Eddy	Tagged	Released
3/16/03	15:30	0.420		96.69	RB	Riffle	Boat	Moved across and U.S. from release site
4/3/03	15:05	0.420		94.60		Eddy	Land-based	Starr Road Bar - Shore Tracked
4/8/03	13:00	0.420		91.93	RB	Eddy	Boat	Gravel bar around point 1/4 mi. below Harvard Road
4/16/03	12:07	0.420		93.52	RB	Eddy	Boat	D.S. end of Is., between gauge and Harvard Road
4/21/03	14:35	0.420		93.52	LB	Eddy	Boat	D.S. end of Is., between gauge and Harvard Road
5/7/03	11:30	0.420		93.60	LB		Boat	D.S. of Island D.S. of USGS guage
5/21/03	11:45	0.420		93.50	LB		Boat	I-90 Island
6/7/03	11:40	0.420		93.50			Land-based	D.S. end of I-90 Island
6/27/03	NA	0.420		NA	NA		Land-based	Assumed Dead-No detections through the

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
								monitoring period
3/10/03	17:05	0.430	LB D.S. of Starr Rd Bar	94.38	LB	Eddy	Tagged	Released
3/16/03	16:35	0.430		94.50	LB	Glide	Boat	Adjacent to monument on Cent. Trail
4/3/03	17:10	0.430		86.80	RB		Land-based	D.S. of bend below Pines Rd.
4/8/03	14:05	0.430		86.86	RB		Boat	1000 ft D.S. RXR Bridge
4/16/03	13:39	0.430		86.90	RB	Eddy	Boat	1000 ft D.S. RXR Bridge, just U.S. of 4/8 location
4/21/03	15:00	0.430		86.90	RB	Eddy	Boat	1000 ft D.S. RXR Bridge, just U.S. of 4/8 location
5/7/03	NA	0.430		NA	NA		Boat	Not detected
5/21/03	11:40	0.430		91.30	LB		Boat	U.S. I-90 Island
6/7/03	NA	0.430		NA	NA		Land-based	Assumed Dead-No detections through the monitoring period
3/10/03	13:20	0.440	RB at downstream I-90 Br.	96.10	RB	Eddy	Tagged	Released
3/16/03	15:35	0.440		96.24	RB	Pool	Boat	By RXR abutment, moved U.S. from release site
4/3/03	14:50	0.440		94.82	LB	Riffle	Land-based	Between Starr Road Bar and Is. Complex
4/8/03	11:50	0.440		94.68	Mid-Chan	Bar	Boat	Starr Road bar
4/16/03	11:47	0.440		94.67	LB	Run/Eddy	Boat	Just D.S. of Starr Road bar
4/21/03	14:15	0.440		94.60	RB	Eddy	Boat	200 ft D.S. of Starr Road bar
5/7/03	11:20	0.440		94.50	LB		Boat	Between Starr Road and Simpson Bar
5/21/03	10:00	0.440		96.80	RB		Boat	Along riffle U.S. Stateline
6/7/03	NA	0.440		NA	NA		Land-based	Not detected
6/27/03	9:30	0.440		96.00	RB	Run	Land-based	I-90 @ Stateline
7/8/03	13:50	0.440		96.00	RB	Run	Land-based	D.S. of I-90 @ Stateline
7/23/03	11:45	0.440		96.40		Run	Land-based	I-90 @ Stateline
8/5/03	10:40	0.440		96.50		Pool	Land-based	RB Centennial Trail bridge @ Stateline
8/21/03	14:20	0.440		96.50		Pool	Land-based	Assumed Dead-No movement through monitoring period

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
11/20/03		0.450	U.S. Stateline	96.80		Eddy	Tagged	Released
1/17/04	11:40	0.450		94.00	Mid-Chan	Pool	Boat	Between Simpson and USGS gauge
3/12/04		0.450		93.75	RB	Glide	Boat	Across from USGS gauge, cobble, 2-3' deep, 1ft/s
3/17/04	11:25	0.450		94.60	LB	Run	Boat	Upper run, across from Starr Road Bar
3/25/04	11:35	0.450		95.00			Boat	Weak signal at Island Complex area
3/29/04	10:50	0.450		95.66	LB	Riffle	Boat	In brushy area adjacent to riffle D.S. of Stateline
4/8/04	11:15	0.450		95.50			Boat	Upper west channel at Island Complex
4/14/04	11:00	0.450		95.50	LB	Glide	Boat	West Channel at Island Complex
4/19/04	11:55	0.450		95.00		Glide	Boat	Main river off West Channel Island Complex
6/11/04	13:50	0.450		84.40	LB	Pool	Boat	Islands U.S. Centennial Trail Bridge
6/25/04		0.450		NA	NA	NA	Boat	Not detected
3/10/03	16:00	0.460	LB D.S. of Starr Rd Bar	94.61	LB	Eddy	Tagged	Released
3/16/03	15:45	0.460		95.90	LB	Riffle	Boat	U.S of riffle, 500 ft D.S. of old highway br.
4/3/03	17:23	0.460		86.26	RB	Eddy	Land-based	Just U.S. of Kaiser outfall
4/8/03	14:10	0.460		86.30	RB		Boat	Across from Mirabeau Point Eddy
4/16/03	13:45	0.460		86.32	LB	Run/Eddy	Boat	Upstream end of Mirabeau Point Eddy
4/21/03	16:05	0.460		86.40	LB	Eddy	Boat	300 ft upstream of Mirabeau Point Eddy
5/7/03	12:50	0.460		86.20	RB	Eddy	Boat	Across from Mirabeau Point Eddy
5/21/03	16:30	0.460		86.20	LB	Pool	Boat	Mirabeau Point Eddy
6/7/03	9:45	0.460		86.20		Pool	Land-based	Mirabeau Point Eddy
6/27/03	18:30	0.460		86.10	NA	Pool	Land-based	Mirabeau Point Eddy
7/8/03	18:25	0.460		86.30		Pool	Land-based	Upper edge of Mirabeau Point Eddy
7/23/03	8:55	0.460		NA			Land-based	Assumed dead-Not detected through the monitoring period
3/13/03	14:30	0.480	RB 600 ft U.S. Harvard Rd	93.18	RB	Eddy	Tagged	Released
3/17/03	10:48	0.480		91.82	LB	Glide	Land-based	100 ft D.S. of fish 0.340
4/3/03	15:50	0.480		91.95	LB		Land-based	Near fish 0.340

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/8/03	12:45	0.480		92.70	RB	Eddy/Bar	Boat	Harvard Bar
4/16/03	12:23	0.480		92.70	RB	Eddy/Bar	Boat	Harvard Bar
4/21/03	14:55	0.480		92.60	RB	Eddy/Bar	Boat	500 ft D.S. Harvard Road
5/7/03	10:50	0.480		95.00	RB		Boat	Across from lower Island Complex
5/21/03	11:15	0.480		94.80	RB		Boat	Across from lower Island Complex
6/7/03	12:05	0.480		94.80			Land-based	D.S. end of Island Complex
6/27/03	NA	0.480		NA	NA		Land-based	Not detected
7/8/03	14:20	0.480		95.00		Riffle	Land-based	Island Complex rapids
7/23/03	8:55	0.480		94.80		Riffle	Land-based	Rapids @ west end of Island Complex
8/5/03	11:30	0.480		94.80		Riffle	Land-based	Rapids west of Island Complex, temp 24C
8/21/03	14:40	0.480		94.80		Riffle	Land-based	West of Island Complex, 24C, cobble
9/3/03	16:15	0.480		94.80		Glide	Land-based	100 ft D.S. riffle west of Island Complex, 23C
9/19/03	16:45	0.480		94.80		Glide	Land-based	100 ft D.S. riffle west of Island Complex
10/27/03	11:20	0.480		94.90		Riffle	Land-based	Lower riffle west of Island Complex
1/17/04	10:00	0.480		94.90		Riffle	Land-based	Lower riffle west of Island Complex
3/12/04	NA	0.480		NA	NA		Boat	Assumed dead-No movement through monitoring period
3/13/03	12:50	0.520	LB D.S. of Starr Rd Bar	94.62	LB	Eddy	Tagged	Released
3/17/03	10:55	0.520		91.46	RB	Glide	Land-based	D.S. of fish 0.180
4/3/03	NA	0.520		NA	NA		Land-based	Assumed Dead-Not detected through monitoring period
3/13/03	10:35	0.530	RB D.S. Jacklin Seed Plant	97.10	RB	Eddy	Tagged	Released
3/16/03	15:50	0.530		95.65	LB	Pool	Boat	U.S. old br. Abutment below a riffle
4/3/03	15:19	0.530		94.10	RB		Land-based	
4/8/03	12:05	0.530		94.56	RB	Eddy	Boat	Lower end of Starr Rd. Bar
4/16/03	12:10	0.530		93.30	LB	Brushy Eddy	Boat	Between Harvard Road and upstream Island
4/21/03	NA	0.530		NA	NA		Boat	Not detected



## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
5/7/03	NA	0.530		NA	NA		Boat	Not detected
5/21/03	NA	0.530		NA	NA		Boat	Not detected
6/6/03	9:35	0.530		71.90	RB		Boat	Riverbend D.S. of Latah Creek
6/23/03	12:30	0.530		72.00		Riffle	Boat	Eddy U.S. of riverbend D.S. Latah Creek
7/9/03	16:20	0.530		72.00		Riffle	Boat	Riverbend D.S. Latah Creek
7/24/03	10:45	0.530		72.00		Riffle	Boat	Riverbend D.S. Latah Creek
8/5/03	14:20	0.530		72.00		Riffle	Boat	Riverbend D.S. Latah Creek
8/21/03	12:00	0.530		72.00	RB	Pool	Land-based	Eddy/riffle 14C boulder/cobble 4+ feet
9/3/03	11:00	0.530		72.00		Riffle	Land-based	RB riffle @ riverbend D.S. Latah Creek
9/19/03	13:03	0.530		72.00		Riffle	Land-based	RB riffle @ riverbend D.S. Latah Creek
10/27/03	15:20	0.530		72.00		Riffle	Land-based	RB riffle @ riverbend D.S. Latah Creek
3/13/04	NA	0.530		NA	NA		Boat	Assumed Dead-No movement through monitoring period
11/20/03		0.540	U.S. Pleasant View Br.	98.60		Eddy	Tagged	Released
1/17/04		0.540		92.10	RB	Pool	Boat	Riverbend D.S. of Harvard Road
3/12/04	11:45	0.540		92.49	RB	Riffle	Boat	Midway between Harvard and Barker Roads
3/17/04	12:05	0.540		91.78	LB	Riffle	Boat	By brushy eddy D.S. of riverbend D.S. of Harvard Road
3/25/04	11:55	0.540		93.43	RB	Run	Boat	500 ft D.S. of the island D.S. of the USGS guage
3/29/04	11:55	0.540		93.20	LB	Run	Boat	In brushy area adjacent to run U.S. of Harvard Road
4/8/04	NA	0.540		NA	NA		Boat	Not detected
4/14/04	11:35	0.540		92.60	RB	Glide	Boat	Harvard Road spawning area
4/19/04	12:35	0.540		91.35		Eddy	Boat	LB eddy US Powerlines US Barker
6/11/04	12:25	0.540		91.30	LB	Eddy	Boat	Eddy 300 ft U.S. Powerlines U.S. Barker
6/25/04	13:45	0.540		91.30	LB	Eddy	Boat	Eddy/riffle U.S. Powerlines U.S. Barker
3/13/03	15:10	0.550	Released at Harvard Bridge	92.70	RB	Eddy	Tagged	Released
3/16/03	17:05	0.550		93.09	RB	Eddy	Boat	200 ft U.S. of release site

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/3/03	15:42	0.550		93.07	RB		Land-based	400 ft U.S. Harvard Road
4/8/03	12:50	0.550		92.90	RB	Eddy	Boat	500 ft U.S. of Harvard Bridge
4/16/03	14:10	0.550		84.53	LB	Eddy	Boat	Just around Plantes Ferry Point
4/21/03	16:30	0.550		84.50	LB	Eddy	Boat	300 ft D.S. Plantes Ferry Point
5/7/03	12:05	0.550		84.60	LB		Boat	Point eddy at Plantes Ferry
5/21/03	16:00	0.550		84.60	LB		Boat	Riverbend @ Plantes Ferry
6/7/03	NA	0.550		NA	NA		Land-based	Not detected
6/27/03	10:30	0.550		93.40	NA	Glide	Land-based	1000 ft D.S. I-90 Island
7/8/03	14:40	0.550		93.40		Run	Land-based	700 ft D.S. I-90 Island
7/23/03	7:00	0.550		88.00		Run	Land-based	1000 ft U.S. Sullivan Rd
8/5/03	15:40	0.550		87.80		Glide	Land-based	100 ft U.S. Sulivan
8/21/03	10:30	0.550		88.20		Glide	Land-based	Recovered on shore, the day after being detected with 100+ trout
3/12/03	13:30	0.640	RB 100 ft U.S. Pines Rd	87.15	RB	Eddy	Tagged	Released
3/17/03	11:36	0.640		87.15	RB	Eddy	Land-based	U.S. of RXR Br and powerlines, Cent. Tr. mi 9.5
4/3/03	17:00	0.640		87.18	RB		Land-based	U.S. Pines Road Bridge, near release site
4/8/03	14:00	0.640		87.13	RB		Boat	100 ft U.S. of RXR Bridge
4/16/03	13:32	0.640		87.18	RB	Eddy	Boat	400 ft U.S. of RXR Bridge
4/21/03	15:50	0.640		87.30	RB	Eddy	Boat	1000 ft U.S. of RXR Bridge
5/7/03	12:40	0.640		87.30	LB		Boat	1000 ft U.S. of RR bridge at Valley Mall
5/21/03	16:50	0.640		87.20	RB		Boat	50 ft U.S. of RR Xing D.S. of Sullivan
6/7/03	10:00	0.640		87.30			Land-based	Powerline Xing D.S. of Sullivan
6/27/03	18:45	0.640		87.30		Run	Land-based	Powerline Xing D.S. of Sullivan
7/8/03	NA	0.640		NA			Land-based	Assumed Dead-Not detected through the monitoring period
3/12/03	14:30	0.660	RB at D.S. end of Kaiser Al.	86.30	RB	Eddy	Tagged	Released
3/17/03	11:49	0.660		86.30	RB	Eddy	Land-based	At release loc., near Fish 0.740, U.S. Kaiser outfall

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/3/03	17:23	0.660		86.30	RB	Eddy	Land-based	Just U.S. of Kaiser outfall
4/8/03	14:10	0.660		86.30	LB		Boat	Upstream end of Mirabeau Point Eddy
4/16/03	13:47	0.660		86.32	LB	Eddy	Boat	Upstream end of Mirabeau Point Eddy
4/21/03	15:10	0.660		91.00	LB	Eddy	Boat	300 ft D.S. of powerlines U.S. of Barker Rd
5/7/03	12:00	0.660		91.30	LB		Boat	Eddy above powerlines at Meyers Rd
5/21/03	17:55	0.660		91.30	LB		Boat	Eddy U.S. powerlines U.S. Barker
6/7/03	9:45	0.660		86.20			Land-based	Mirabeau Point Eddy
6/27/03	17:55	0.660		84.30	NA	Run	Land-based	Plantes Ferry Islands
7/8/03	NA	0.660		NA			Land-based	Assumed Dead-Not detected through the monitoring period
3/12/03	15:00	0.680	Plantes Ferry access ramp	84.39	LB	Eddy	Tagged	Released
3/17/03	11:45	0.680		84.42	RB	Glide	Land-based	150 ft U.S. of release site, Cent. Tr. mi 10.5
4/3/03	17:19	0.680		84.42	RB	Eddy	Land-based	Near release site
4/8/03	14:05	0.680		86.56	LB		Boat	1300 ft U.S. Mirabeau Point Eddy
4/16/03	13:43	0.680		86.42	RB	Run/Eddy	Boat	100 ft U.S. Mirabeau Point Eddy
4/21/03	16:00	0.680		86.50	RB	Eddy	Boat	1000 ft U.S. Mirabeau Point Eddy
5/7/03	11:45	0.680		92.80	RB		Boat	Brushy area 600 ft U.S. of Harvard
5/21/03	12:30	0.680		92.30	RB		Boat	Eddy in riverbend D.S. Harvard
6/7/03	9:45	0.680		86.40			Land-based	300 ft U.S. Mirabeau Point Eddy
6/27/03	18:35	0.680		86.30	NA	Riffle	Land-based	1000 ft U.S. Mirabeau Point Eddy
7/8/03	18:35	0.680		86.50		Riffle	Land-based	First rapids U.S. Mirabeau Point Eddy
7/23/03	10:00	0.680		86.50		Run	Land-based	500 ft U.S. Mirabeau Point Eddy
8/5/03	14:45	0.680		86.30		Glide	Land-based	500 ft U.S. Mirabeau Point Eddy
8/21/03	9:25	0.680		86.30		Glide	Land-based	500 ft U.S. Mirabeau Pool, boulder/cobble, springs
9/3/03	11:40	0.680		86.60		Run	Land-based	1000 ft U.S. Mirabeau Pool, boulder/cobble
9/19/03	11:05	0.680		86.60		Run	Land-based	1000 ft U.S. Mirabeau Pool, boulder/cobble
10/27/03	13:20	0.680		86.60		Run	Land-based	1/4 mile U.S. Mirabeau Pool
1/17/04	15:10	0.680		86.20		Pool	Boat	Mirabeau Pool

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
3/12/04	12:45	0.680		86.63	LB	Run	Boat	1/4 mile U.S. Mirabeau Pool
3/17/04	13:20	0.680		86.63	LB	Eddy	Boat	1/4 mile U.S. Mirabeau Pool, head of eddy
3/25/04	13:05	0.680		86.61	LB	Eddy	Boat	1/4 mile U.S. Mirabeau Pool, in eddy adjacent to riffle
3/29/04	13:05	0.680		86.63	LB	Eddy	Boat	1/4 mile U.S. Mirabeau Pool, in eddy adjacent to riffle
4/8/04	12:50	0.680		86.63		Eddy	Boat	1/4 mile U.S. Mirabeau Pool, in eddy adjacent to riffle
4/14/04	12:40	0.680		86.40	RB	Eddy	Boat	300 ft D.S. of riffle, U.S. Mirabeau Pool
4/19/04	13:20	0.680		86.30	LB	Glide	Boat	400 ft U.S. Mirabeau Pool
6/11/04	13:25	0.680		86.10		Pool	Boat	Mirabeau pool
6/25/04	15:10	0.680		86.10		Pool	Boat	Mirabeau pool
3/12/03	12:00	0.700	RB 200 ft U.S. Sullivan Rd	87.89	RB	Eddy	Tagged	Released
3/17/03	11:24	0.700		87.89	RB	Glide	Land-based	U.S. Sullivan Rd, Cent Tr. Mi 8.9, near release site
4/3/03	16:57	0.700		87.70	RB		Land-based	Just D.S. Sullivan Rd, 200 ft D.S. of release site
4/8/03	13:50	0.700		87.70	RB	Eddy	Boat	Just D.S. of Sullivan Road Bridge
4/16/03	13:30	0.700		87.70	RB	Eddy	Boat	200 ft D.S. of Sullivan Road Bridge
4/21/03	15:45	0.700		87.70	RB	Eddy	Boat	Sullivan Road Bridge
5/7/03	12:30	0.700		88.30	RB		Boat	River bend U.S. Sullivan
5/21/03	NA	0.700		NA	NA		Boat	Not detected
6/7/03	NA	0.700		NA	NA		Land-based	Not detected
6/27/03	NA	0.700		NA	NA		Land-based	Not detected
7/8/03	NA	0.700		NA	NA		Land-based	Not detected
7/24/03	11:50	0.700		68.60		Run	Boat	Detected in lower river, 200 ft U.S. Riverbend Bar pool
8/5/03	15:15	0.700		67.90		Run	Boat	Detected in lower river, at riverbend DS Riverbend Bar
9/19/03	12:30	0.700		68.50		Pool	Boat	Mid Riverbend pool

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
10/29/03	13:50	0.700		68.50		Pool	Boat	Mid Riverbend pool
3/12/04	NA	0.700		NA	NA		Boat	Assumed Dead-No movement through monitoring period
3/12/03	10:55	0.720	RB 1000 ft D.S. Harvard Rd.	91.69	RB	Eddy	Tagged	Released
3/17/03	10:40	0.720		91.70	RB	Run/Eddy	Land-based	Just D.S. of Cent. Trail mi 5, near release site
4/3/03	16:37	0.720		89.37	RB		Land-based	D.S. 2nd bend below Barker Rd, above Flora Rapids.
4/8/03	13:40	0.720		89.18	RB	Run	Boat	D.S. of upper Flora Rapids.
4/16/03	13:10	0.720		89.12	LB	Eddy	Boat	200 ft D.S. of powerlines by Flora Rd
4/21/03	15:40	0.720		89.00	RB	Eddy	Boat	300 ft U.S. of Flora Rapids
5/7/03	12:25	0.720		89.00	RB		Boat	Head of Flora Rapids
5/21/03	17:30	0.720		88.90	RB		Boat	Head of Flora Rapids
6/7/03	10:20	0.720		88.30			Land-based	Riverbend U.S. of Sullivan Rd.
6/27/03	16:50	0.720		89.30	NA	Run	Land-based	Flora Rapids
7/8/03	17:20	0.720		89.00		Run	Land-based	Upstream of Flora Rapids
7/23/03	7:15	0.720		88.40		Rapids	Land-based	Flora Rapids bend U.S. Sullivan Rd.
8/5/03	16:00	0.720		88.80		Riffle	Land-based	Mid Flora Rapids
8/21/03	11:20	0.720		88.90		Riffle	Land-based	Flora Rapids @ upper riverbend, boulder/cobble
9/3/03	12:45	0.720		88.90		Riffle	Land-based	Tag recovered on shore
11/20/03		0.720	U.S. Stateline	96.80		Eddy	Tagged	Released (Tag reused)
1/17/04	10:45	0.720		96.40	LB	Pool	Boat	LB at I-90 bridge at Stateline
3/12/04	10:15	0.720		96.21	RB	Pool	Boat	RB at I-90/Centennial Trail Crossing, at Stateline
3/17/04	11:50	0.720		96.16	LB	Pool	Boat	LB between I-90 and Centennial Trail Crossing, at Stateline
3/25/04	11:15	0.720		96.18	LB	Pool	Boat	30 ft D.S. of Centennial Trail Bridge, at Stateline
3/29/04	10:45	0.720		96.17	LB	Eddy	Boat	70 ft D.S. of Centennial Trail Bridge, at Stateline

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/8/04	10:45	0.720		96.17	LB	Eddy	Boat	50 ft D.S. of Centennial Trail Bridge, at Stateline
4/14/04	10:40	0.720		96.40	LB	Eddy	Boat	State Line immediately D.S. Cent. Trail bridge
4/19/04	12:00	0.720		94.80		Glide	Boat	Starr Road Bar spawning area
6/11/04		0.720		NA	NA	NA	Boat	Not detected
6/25/04		0.720		NA	NA	NA	Boat	Not detected
3/12/03	14:15	0.740	RB at D.S. end of Kaiser Al.	86.30	RB	Eddy	Tagged	Released
3/17/03	11:51	0.740		86.30	RB	Eddy	Land-based	At release loc., near Fish 0.660
4/3/03	17:20	0.740		86.30	RB		Land-based	Just U.S. of Kaiser outfall, 100 ft U.S. of release site
4/8/03	14:10	0.740		86.30	RB		Boat	Across from Mirabeau Point Eddy
4/16/03	13:47	0.740		86.32	RB	Eddy	Boat	Upstream end of Mirabeau Point Eddy
4/21/03	16:10	0.740		86.30	LB	Eddy	Boat	Mirabeau Point Eddy
5/7/03	12:45	0.740		86.20	LB	Eddy	Boat	Mirabeau Point Eddy
5/21/03	16:30	0.740		86.20	LB		Boat	Mirabeau Point Eddy
6/7/03	9:45	0.740		86.30			Land-based	100 ft U.S. of Mirabeau Point Eddy
6/27/03	18:40	0.740		86.10	NA	Pool	Land-based	Mirabeau Point Eddy
7/8/03	18:20	0.740		86.10		Pool	Land-based	Mirabeau Point Eddy
7/23/03	10:15	0.740		86.20		Pool	Land-based	Mirabeau Point Eddy
8/5/03	15:10	0.740		86.20		Glide	Land-based	RB Mirabeau Pool
8/21/03	9:15	0.740		86.20		Glide	Land-based	100 ft U.S. Mirabeau Pool, boulder/cobble
9/3/03	NA	0.740		NA	NA		Land-based	Not detected
9/19/03	12:00	0.740		83.50	NA	Reservoir	Land-based	1/2 mile DS Plantes Ferry Br in Upriver Pool
10/27/03	13:55	0.740		83.50	NA	Reservoir	Land-based	Assumed Dead-No movement through monitoring period
3/12/03	13:50	0.760	RB 100 ft U.S. Pines Rd	87.15	RB	Eddy	Tagged	Released
3/17/03	11:30	0.760		87.15	RB	Eddy	Land-based	U.S. of RXR Br and powerlines, Cent. Tr. mi 9.5

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/3/03	17:07	0.760		87.18			Land-based	U.S. Pines Road Bridge, near release site
4/8/03	14:00	0.760		87.13	RB		Boat	100 ft U.S. of RXR Bridge
4/16/03	13:30	0.760		87.58	LB	Eddy	Boat	600 ft D.S. Sullivan Rd
4/21/03	15:50	0.760		87.50	LB	Eddy	Boat	1000 ft D.S. Sullivan Rd
5/7/03	12:40	0.760		87.50	LB		Boat	700 ft D.S. of Sullivan
5/21/03	17:00	0.760		87.30	LB		Boat	1000 ft U.S. of RR Xing D.S. Sullivan
6/7/03	10:00	0.760		87.30			Land-based	300 ft D.S. RR Xing D.S. Sullivan
6/27/03	18:50	0.760		87.30	NA	Run	Land-based	Powerlines D.S. Sullivan
7/8/03	18:45	0.760		87.50		Run	Land-based	200 ft U.S. powerlines D.S. Sullivan Bridge
7/23/03	NA	0.760		NA			Land-based	Assumed Dead-Not detected through monitoring period
3/12/03	15:15	0.780	Plantes Ferry access ramp	84.39	LB	Eddy	Tagged	Released
3/17/03	12:10	0.780		84.25	LB	Eddy	Land-based	D.S. of release loc., just U.S. of Plantes Ferry bridge
4/3/03	17:40	0.780		84.25	LB		Land-based	Just U.S. Plantes Ferry Bridge
4/8/03	14:30	0.780		84.38	LB	Eddy	Boat	Plantes Ferry Islands
4/16/03	14:15	0.780		84.16	LB	Eddy	Boat	Eddy D.S. of Plantes Ferry Bridge
4/21/03	16:40	0.780		84.40	LB	Eddy	Boat	200 ft U.S. of Plantes Ferry Bridge
5/7/03	12:40	0.780		84.30	LB	Eddy	Boat	300 ft U.S. of Plantes Ferry Bridge
5/21/03	15:50	0.780		84.30	LB		Boat	100 ft U.S. of Plantes Ferry Bridge
6/7/03	9:10	0.780		84.40			Land-based	Immed U.S. of Plantes Ferry Bridge
6/27/03	17:40	0.780		85.30	NA	Run	Land-based	50 ft D.S. Trent Bridge
7/8/03	18:05	0.780		85.30		Glide	Land-based	100 ft U.S. Trent Bridge
7/23/03	10:25	0.780		85.30		Glide	Land-based	100 ft U.S. Trent Bridge
8/5/03	16:30	0.780		85.20		Glide	Land-based	200' DS Trent Bridge
8/21/03	13:10	0.780		85.30		Glide	Land-based	100 ft D.S. Trent, 12C, cobble/boulder
9/3/03	13:20	0.780		85.30		Run	Land-based	100 ft D.S. Trent Bridge, 13C, boulder/cobble
9/19/03	11:30	0.780		85.30		Run	Land-based	100 ft D.S. Trent Bridge, 13C, boulder/cobble

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
10/27/03	NA	0.780		NA	NA		Land-based	Not detected
1/17/04	14:50	0.780		85.19	RB	Run	Boat	300 ft D.S. of Trent Bridge
3/12/04	13:00	0.780		85.19	RB	Run	Boat	300 ft D.S. of Trent Bridge
3/17/04	13:35	0.780		85.11	RB	Run	Boat	200 ft D.S. of Trent Bridge
3/25/04	13:15	0.780		85.19	RB	Run	Boat	50 ft D.S. of bridge U.S. of Trent
3/29/04	13:40	0.780		85.11			Boat	300 ft D.S. of bridge U.S. of Trent
4/8/04	13:05	0.780		85.11			Boat	150 ft D.S. of Trent
4/14/04	12:45	0.780		85.20	RB		Boat	200 ft D.S. Trent Bridge
4/19/04	13:40	0.780		85.20	RB		Boat	300 ft D.S. Trent Bridge
6/11/04	13:35	0.780		85.20	RB	Run	Boat	300 ft D.S. Trent bridge
6/25/04	16:30	0.780		85.20	RB	Run	Boat	300 ft D.S. Trent bridge
11/18/03		1.420	D.S McGuire Gauge	100.70		Eddy	Tagged	Released
1/17/04	10:40	1.420		95.00	RB	Run	Boat	Island Complex, adjacent to fast water 1-2 ft deep, cobble
3/12/04	10:40	1.420		95.00	RB	Run	Boat	Island Complex, adjacent to fast water 1-2 ft deep, cobble
3/17/04	11:10	1.420		95.00	RB	Riffle	Boat	Across from Island Complex
3/25/04	11:30	1.420		95.00	RB	Riffle	Boat	Across from Island Complex
3/29/04	11:05	1.420		95.00	RB	Riffle	Boat	Across from Island Complex
6/11/04		1.420		95.10			Boat	Main river off W. Channel Island Complex
6/25/04	12:40	1.420		95.10			Boat	Main river off W. Channel Island Complex
11/20/03		1.530	D.S. Jacklin Seed	97.30		Eddy	Tagged	Released
1/17/04	14:50	1.530		85.50		Run	Boat	200 ft U.S. of Trent Bridge
3/12/04	13:00	1.530		85.42	RB	Run	Boat	150 ft D.S. of RXR bridge, U.S. of Trent Bridge
3/17/04	13:35	1.530		85.42	RB	Run	Boat	75 ft D.S. of RXR bridge, U.S. of Trent Bridge
3/25/04	13:15	1.530		85.42	RB	Run	Boat	75 ft D.S. of RXR bridge, U.S. of Trent Bridge



## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
3/29/04	13:40	1.530		85.42	RB	Run	Boat	100 ft D.S. of RXR bridge, U.S. of Trent Bridge
4/8/04	13:05	1.530		85.42	RB	Run	Boat	75 ft D.S. of RXR bridge, U.S. of Trent Bridge
4/14/04	12:45	1.530		85.45	RB		Boat	50 ft D.S. RXR bridge, U.S. Trent Bridge
4/19/04	13:40	1.530		85.45	RB		Boat	50 ft D.S. RXR bridge, U.S. Trent Bridge
6/11/04	11:15	1.530		85.45	RB		Boat	50 ft D.S. RXR bridge, U.S. Trent Bridge
6/25/04	16:30	1.530		85.45	RB		Boat	Tag recovered RB 50 ft D.S. RR bridge U.S. Trent
3/13/03	13:25	1.540	LB 500 ft Gauging Station	94.12	LB	Eddy	Tagged	Released
3/16/03	16:40	1.540		94.17	RB	Glide	Boat	Bar point D.S. of monument on Cent. Trail
4/3/03	15:20	1.540		94.20			Land-based	Near release site
4/8/03	12:20	1.540		94.15	RB	Eddy	Boat	300 ft D.S. of large point and bar below Starr Rd
4/16/03	11:25	1.540		94.95	LB	Riffle	Boat	Head end of mid-chan. @ Is. Complex (6 redds observed)
4/21/03	14:15	1.540		94.60	RB	Eddy	Boat	200 ft D.S. Starr Road Bar
5/7/03	11:15	1.540		94.70	RB		Boat	Lower Starr Road Bar
5/21/03	11:35	1.540		94.40	LB		Boat	D.S. of Starr Road Bar
6/7/03		1.540		NA	NA		Land-based	Not detected
6/27/03		1.540		NA	NA		Land-based	Not detected
7/8/03		1.540		NA			Land-based	Not detected
7/23/03		1.540		NA			Land-based	Not detected
8/5/03		1.540		NA	NA		Land-based	
8/21/03		1.540		NA	NA		Land-based	Not detected
9/3/03		1.540		NA	NA		Land-based	Not detected
9/19/03		1.540		NA	NA		Land-based	Not detected
10/27/03		1.540		NA	NA		Land-based	Not detected
11/18/03	11:40	1.400	D.S McGuire Gauge	100.70		Eddy	Tagged	Released

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
1/17/04		1.400		NA	NA		Boat	Not detected
3/12/04		1.400		NA	NA		Boat	Not detected
3/17/04		1.400		NA	NA		Boat	Not detected
3/25/04		1.400		NA	NA		Boat	Not detected
3/29/04		1.400		NA	NA		Boat	Not detected
4/8/04		1.400		NA	NA		Boat	Not detected
4/14/04		1.400		NA	NA		Boat	Not detected
4/19/04		1.400		NA	NA		Boat	Not detected
6/11/04	13:10	1.400		87.50	RB		Boat	500 ft D.S. Sullivan
6/25/04	14:50	1.400		87.50	RB		Boat	500 ft D.S. Sullivan
3/13/03	13:10	1.560	LB D.S. of Starr Rd Bar	94.60	LB	Eddy	Tagged	Released
3/16/03	16:40	1.560		94.45	LB	Glide	Boat	Just D.S of monument on Cent. Trail
4/3/03	14:35	1.560		95.10			Land-based	Upper end of Is. Complex
4/8/03	11:35	1.560		94.95	LB	Eddy	Boat	Spawning at Island Complex, in main channel
4/16/03	11:25	1.560		94.95	LB	Riffle	Boat	Head end of mid-chan. @ Is. Complex (6 redds observed)
4/21/03	13:20	1.560		95.00	LB	Eddy	Boat	U.S. west channel @ Is. Complex
5/7/03	11:15	1.560		95.00	LB		Boat	300 ft U.S. of west channel at Isl Complex
5/21/03	11:40	1.560		94.40	RB		Boat	Rapids D.S. Starr Road Bar
6/7/03	12:00	1.560		94.50			Land-based	Starr Road
6/27/03	18:35	1.560		86.10	NA	Pool	Land-based	Mirabeau Point Eddy
7/8/03	18:25	1.560		86.30		Pool	Land-based	Mirabeau Point Eddy upper edge
7/23/03	10:15	1.560		86.20		Pool	Land-based	Mirabeau Point Eddy
8/5/03	14:30	1.560		86.30		Glide	Land-based	300 ft U.S. of Mirabeau Pool
8/21/03	9:20	1.560		86.20		Glide	Land-based	50 ft U.S. of Mirabeau Pool, 10C, boulder/cobble
9/3/03	11:35	1.560		86.30		Run	Land-based	300 ft U.S. of Mirabeau Pool, boulder/cobble
9/19/03	11:10	1.560		86.30		Run	Land-based	300 ft U.S. of Mirabeau Pool, boulder/cobble

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
10/27/03	11:35	1.560		94.70	LB	Run	Land-based	Across from Starr Road Bar
1/17/04	11:10	1.560		94.70	LB	Run	Boat	Across from Starr Road Bar
3/12/04	10:45	1.560		94.68	LB	Eddy	Boat	Across from Starr Road Bar, 2-3 ft deep, <1 ft/s
3/17/04	11:25	1.560		94.68	LB	Run	Boat	Across from Starr Road Bar
3/25/04	11:40	1.560		94.68	LB	Eddy	Boat	At point across from Starr Road Bar
3/29/04	11:35	1.560		94.68	LB	Eddy	Boat	At point across from Starr Road Bar
6/11/04	11:30	1.560		94.68	LB		Boat	Across from Starr Road Bar
6/25/04	12:25	1.560		94.68	LB		Boat	Tag recovered LB across from Starr Road Bar
3/13/03	12:00	1.580	LB U.S. end I-90 rest area	95.61	LB	Eddy	Tagged	Released
4/3/03	14:45	1.580		95.10	LB		Land-based	Upper end of Is. Complex
4/8/03	11:35	1.580		94.95	LB	Eddy	Boat	Spawning at Island Complex, in main channel
4/16/03	11:25	1.580		94.95	LB	Riffle	Boat	Head end of mid-chan. @ Is. Complex (6 redds observed)
4/21/03	13:20	1.580		95.00	LB	Eddy	Boat	Head end of west channel @ Is. Complex
5/7/03	11:15	1.580		95.00	LB	Eddy	Boat	400 ft U.S. of west channel at Isl Complex
5/21/03	11:00	1.580		95.00	LB		Boat	Island Complex rapids
6/7/03	NA	1.580		NA	NA		Land-based	Not detected
6/27/03	NA	1.580		NA	NA		Land-based	Not detected
7/8/03	13:45	1.580		96.00	RB	Run	Land-based	Under I-90 @ Stateline
7/23/03	11:45	1.580		96.40	RB	Run	Land-based	I-90 Stateline
8/5/03	11:00	1.580		96.40	RB	Pool	Land-based	Assumed Dead-No movement through monitoring period
11/20/03		1.590	D.S. Pleasant View Br.	98.40		Eddy	Tagged	Released
1/17/04	10:00	1.590		98.20	LB	Pool	Boat	Upper pool, D.S. of Pleasant View
3/12/04	9:50	1.590		97.76		Run	Boat	U.S. of Jacklin Seed
3/17/04	10:25	1.590		97.85	RB	Eddy	Boat	Eddy D.S. of rapids, below Pleasant View

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
3/25/04	10:40	1.590		97.82	RB	Eddy	Boat	Eddy at upstream end of Jacklin Seed run
3/29/04	10:20	1.590		97.82	RB	Eddy	Boat	Eddy at upstream end of Jacklin Seed run
4/8/04	10:25	1.590		97.82	RB	Eddy	Boat	Eddy at upstream end of Jacklin Seed run
4/14/04	10:15	1.590		98.25	RB	Eddy	Boat	D.S. riffle, D.S. of Pleasant View Bridge
4/19/04	11:00	1.590		98.25		Riffle	Boat	Riffle D.S. Pleasant View Bridge
6/11/04	10:15	1.590		98.25	RB	Eddy	Boat	Eddy D.S. rapids D.S. Pleasant View Br
6/25/04	10:00	1.590		98.40	LB	Eddy	Boat	LB confluence of braided channel
11/20/03		1.650	D.S. Jacklin Seed	97.30		Eddy	Tagged	Released
1/17/04	10:25	1.650		97.10	LB	Riffle	Boat	Lower riffle D.S. of Jacklin Seed
3/12/04	NA	1.650		NA	NA		Boat	Not detected
3/17/04	10:45	1.650		96.76	NA		Boat	Weak signal D.S. of Jacklin Seed (May be out of water)
3/25/04	11:10	1.650		96.83	RB	Riffle	Boat	Jacklin Seed riffle
3/29/04	10:30	1.650		96.85	RB	Eddy	Boat	Eddy along riffle D.S. of Jacklin Seed, D.S. of inundated veg.
4/8/04	10:55	1.650		95.50	RB	Run	Boat	Middle of run U.S. of Island Complex
4/14/04	10:45	1.650		96.00	LB	Glide	Boat	300 ft D.S. Old Hwy bridge, at State Line
4/19/04	11:20	1.650		96.80	RB	Riffle	Boat	RB along mid-riffle U.S. of Stateline
6/11/04	10:40	1.650		97.30	LB	Riffle	Boat	Rapids D.S. Jacklin Seed
6/25/04	10:50	1.650		97.30	Mid	Riffle	Boat	Mid rapids DS Jacklin Seed
11/20/03		1.690	D.S. Pleasant View Br.	98.40		Eddy	Tagged	Released
1/17/04	10:00	1.690		98.50	RB	Pool	Boat	RB, lower Pleasant View pool
3/12/04	9:40	1.690		98.04	Mid	Riffle	Boat	Head of riffle D.S. of Pleasant View, 2-3 ft deep, >1 ft/s
3/17/04	10:20	1.690		98.04	LB	Eddy	Boat	LB side channel, in brush, D.S. of Pleasant View
3/25/04	10:35	1.690		98.03	LB	Eddy	Boat	Upper LB riffle in inundated veg.
3/29/04	10:15	1.690		98.03	LB	Eddy	Boat	Upper LB riffle in inundated veg.
4/8/04	10:25	1.690		98.03	LB	Eddy	Boat	Upper LB riffle in inundated veg.

## Appendix C – Track Summaries (continued)

**Table C-2. 2003-04 Spokane River Fish Tracking (Upper River Reach)**

Date	Time	Tag	Release Site	Location (RM)	Position	Habitat Type	Tracking Method	Comments
4/14/04	10:15	1.690		98.45	LB	Brush	Boat	Along riffle D.S. Pleasant View Bridge
4/19/04	11:00	1.690		98.45	LB	Brush	Boat	Along riffle D.S. Pleasant View Bridge
6/11/04	10:00	1.690		98.70	LB	Eddy	Boat	Islands U.S. Pleasant View Br
6/25/04	9:45	1.690		98.50	LB	Eddy	Boat	Upper side channel D.S. Pleasant View
11/20/03		1.950	D.S. McGuire	100.70		Eddy	Tagged	Released
1/17/04	NA	1.950		NA	NA		Boat	Not detected
3/12/04	NA	1.950		NA	NA		Boat	Not detected
3/17/04	9:50	1.950		99.91		Pool	Boat	Upper pool, D.S. of McGuire Road
3/25/04	9:50	1.950		99.88	Mid	Pool	Boat	Mid channel near McGuire guage
3/29/04	9:50	1.950		99.93	LB	Pool/Eddy	Boat	75 ft U.S. of McGuire gauge
4/8/04	10:00	1.950		99.93	LB	Pool/Eddy	Boat	50 ft U.S. of McGuire gauge
4/14/04	11:25	1.950		93.00	RB	Riffle	Boat	Riffle U.S. Harvard Bridge
4/19/04	11:00	1.950		98.50		Riffle	Boat	Riffle D.S. Pleasant View Bridge
6/11/04	10:15	1.950		98.10	RB	Run	Boat	Upper run D.S. eddy D.S. Pleasant View
6/25/04	10:20	1.950		98.10	RB	Run	Boat	Upper run D.S. eddy D.S. Pleasant View

**APPENDIX D**

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**Final Spokane River Rainbow Trout Tracking Update  
(as of 7/29/04)**

## APPENDIX D

### Final Spokane River Rainbow Trout Tracking Update (as of 7/29/04)

#### FINAL STATUS OF RADIO-TAGGED FISH IN THE UPPER RIVER STUDY REACH

In addition to the weekly tracking surveys in the upper river reach between 3/12 and 4/19/04, two subsequent surveys were conducted in the upper river study reach in June, and two more in July. These tracking surveys were conducted to determine the distribution and final status of the tagged fish in the upper river study reach after the 2004 spawning season. Snorkel surveys were also conducted in conjunction with the two July tracking surveys.

Eight (18%) of the 45 fish tagged and released in the upper river study reach in 2003, were still assumed to be alive in June or July (Table D1 and D2). This includes two (6%) of the March-released fish, and six (43%) of the November-released fish. However, one of the November-released fish (Tag Codes 0.300) was undetected in July and another (Tag Code 1.650) was found dead on July 29. Although this fish was found dead, the condition of the carcass and the tracking results suggest that the fish was alive through June. This fish was tagged in Idaho (RM 97.3) in November, moved about 2 miles downstream (to the Island Complex spawning area) between January and March, and back to near the release location by June 25. The carcass was recovered about 4 miles downstream (RM 93) on July 29. This apparent delay in post-spawning mortality was similar to that reported by Bennett and Underwood (1988) for rainbow trout in the Spokane River.

Few fish were observed in the Idaho portion of the upper river study reach in June and July, and this distribution is likely the result of high water temperatures in the upper Spokane River during the summer. Afternoon water temperatures just upstream of Barker Road on July 28 were measured at 27° C, although the morning temperature several weeks earlier was about 21° C. Such daily fluctuations are suspected of providing enough relief for rainbow trout to survive water temperatures that would otherwise be lethal (Bailey and Saltes 1982). Two fish (Tag Codes 1.690 and 1.950) were detected in Idaho by July 28, which had moved upstream after the 2004 spawning season, but were not observed during the July snorkeling efforts. However, some other trout were observed in these areas during the snorkeling surveys. One such area was a deep pool at McGuire Road, where several trout were observed during the July snorkel surveys. A small tributary feeding this pool, is suspected of providing some thermal refuge for rainbow trout to survive the high water temperatures in the reach. It is also suspected that Fish 0.210, which was undetected through much of the 2003 summer monitoring period, might have sought refuge in this area because it was subsequently detected here in March 2004.

The primary thermal refuge area in the upper Spokane River is downstream of Barker Road (RM 90.4) (Golder and HDR 2004). Both of the March-release fish that were still active in July (Tag Codes 0.380 and 0.680), were located downstream of Barker Road in the Mirabeau Point pool area (RM 86.2). One of the November-released fish (Tag Code 0.280) was also located in the Mirabeau Point pool, and three other November-released fish were located between Barker Road (RM 90.4) and Mirabeau Point. Six of the March-released fish also appeared to seek thermal refuge in these areas after the 2003 spawning season. We also observed relatively large concentrations of rainbow trout in the pools in this reach during the summer months of 2003 and 2004.

Based on the results of the 2004 surveys (particularly the June and July surveys), a total of 11 fish were assumed to be alive during the 2004 spawning season (see Tables D1 and D2). Four of the November-released fish were only detected in Idaho, while the other seven fish (including five of the November-released fish) were detected (and are assumed to have spawned) in Washington during the 2004 spawning season.

A total of 14 radio tags were recovered from the upper river study reach by July 29, including eight (26%) and six (43%) of the March and November released fish, respectively. Five of these tags were recovered during the two July surveys. While five of the eight tags recovered after May of 2003 were from fish that showed no obvious signs of movement in 2004, and are assumed to have died or lost their tags prior to the 2004 spawning season, the other fish appeared to be alive during the 2004 spawning season.

**Table D1. Location of Upper River Study Reach Fish Released in March 2003, by Season, Through the July 2004 Surveys.**

Tag	Release Site	Release Location (RM)	2003 Spawning Season	2003 Summer Season	2003 Fall Season	2004 Winter Season	2004 Spawning Season	2004 Summer Season	Status as of 7/29/04
0.380	D.S. of Starr Rd Bar	94.65	94.65	86.40	86.40	86.60	86.30	86.10	Active fish, in Mirabeau Point eddy
0.680	Plantes Ferry access ramp	84.39	86.50	86.40	86.60	86.20	86.40	86.10	Active fish, in Mirabeau Point eddy
0.520	D.S. of Starr Rd Bar	94.62							Assumed dead - Last detected 3/17/03
0.430	D.S. of Starr Rd Bar	94.38	86.90						Assumed dead - Last detected 5/21/03
1.540	500 ft Gauging Station	94.12	94.20						Assumed dead - Last detected 5/21/03
0.660	D.S. end of Kaiser Al.	86.30	91.30						Assumed dead - Last detected 6/27/03
0.460	D.S. of Starr Rd Bar	94.61	86.30						Assumed dead - Last detected 7/8/03
0.640	100 ft U.S. Pines Rd	87.15	87.20						Assumed dead - Last detected 7/8/03
0.760	100 ft U.S. Pines Rd	87.15	87.50						Assumed dead - Last detected 7/8/03
0.390	D.S. of Starr Rd Bar	94.15	94.23	86.50					Assumed Dead - Last detected 9/3/03
0.340	600 ft D.S. Harvard Rd.	92.05	94.65	92.10	92.10				Assumed dead - Last movement 4/16/03
0.410	At I-90 rest area	95.45	94.20	94.00					Assumed dead - Last movement 5/21/03
0.420	Near bend U.S. of I-90	96.62	93.52						Assumed dead - Last movement 5/7/03
0.480	600 ft U.S. Harvard Rd	93.18	92.70	94.80					Assumed dead - Last movement 7/23/03
1.580	U.S. end I-90 rest area	95.61	95.00	96.40					Assumed dead - Last movement 7/23/03
0.350	U.S. of Harvard Rd	93.43	93.50	87.60	87.60				Assumed dead - Last movement 8/5/03
0.400	D.S. of Starr Rd Bar	94.58	93.60	92.00					Assumed dead - Last movement 8/5/03
0.440	Downstream I-90 Br.	96.10	94.70	96.50					Assumed dead - Last movement 8/5/03
0.700	200 ft U.S. Sullivan Rd	87.89	87.70	68.50					Assumed dead - Last movement in lower river 10/29/03
0.530	D.S. Jacklin Seed Plant	97.10	94.50	72.00					Assumed dead - Last movement in lower river 6/6/03
0.780	Plantes Ferry access ramp	84.39	84.40	85.30					Assumed dead - Last movement 6/6/03
0.740	D.S. end of Kaiser Al.	86.30	86.30	86.20	83.50				Assumed dead - Last movement in Upriver Pool 9/19/03
0.360	U.S. of Harvard Rd	93.41	93.40	87.80	93.60				Assumed dead - Weak signal (poss. out of water) since 8/21/03
0.210	1000 ft D.S. Harvard Rd.	91.72	91.52	91.80	ND	99.51			Tag recovered 3/25/04
1.560	D.S. of Starr Rd Bar	94.60	94.95	86.20	94.70				Tag recovered 6/25/04, no movement in 2004



**Table D1. Location of Upper River Study Reach Fish Released in March 2003, by Season, Through the July 2004 Surveys (continued)**

Tag	Release Site	Release Location (RM)	2003 Spawning Season	2003 Summer Season	2003 Fall Season	2004 Winter Season	2004 Spawning Season	2004 Summer Season	Status as of 7/29/04
0.180	1200 ft D.S. Harvard Rd.	91.52	91.37	91.60	91.30				Tag recovered 7/29/04
0.550	At Harvard Bridge	92.70	84.50	88.00					Tag recovered 8/21/03
0.320	400 ft D.S. Harvard Rd.	92.25	92.70	93.00					Tag recovered 9/19/03
0.370	500 ft D.S. Harvard Rd.	92.15	91.30	91.30					Tag recovered 9/19/03
0.300	700 ft D.S. Harvard Rd.	91.97	92.05	92.00					Tag recovered 9/3/03
0.720	1000 ft D.S. Harvard Rd.	91.69	89.20	88.90					Tag recovered 9/3/03

**Table D2. Location of Upper River Study Reach Fish Released in November 2003, by Season, Through the July 2004 surveys.**

Tag	Release Site	Release Location (RM)	2003 Spawning Season	2003 Summer Season	2003 Fall Season	2004 Winter Season	2004 Spawning Season	2004 Summer Season	Status as of 7/29/04
0.280	U.S. Stateline	96.80			96.80	86.30	88.70	86.30	Active fish in Mirabeau Pool
1.950	D.S. McGuire	100.70			100.70		93.00	100.50	Active fish in the McGuire Pool
1.690	D.S. Pleasant View Br.	98.40				98.50	98.03	99.00	Active fish upstream of Pleasant View
1.590	D.S. Pleasant View Br.	98.40				98.20	98.25		Assumed dead-not observed during July snorkle survey
0.720	U.S. Stateline	96.80				96.40	94.80	96.40	Assumed dead-undetected during July surveys
0.450	U.S. Stateline	96.80				94.00	94.50	84.40	Assumed dead - downstream of Upriver Dam 7/13
0.300	U.S. Stateline	96.80			96.80	86.30	87.00	89.70	Last detected near Flora Rapids on 6/11
1.400	D.S McGuire Gauge	100.70						87.50	First detection on 6/11
0.310	U.S. Jacklin Seed	97.80			97.80	97.20			Tag recovered 6/25, no movement in 2004
1.530	D.S. Jacklin Seed	97.30				85.50			Tag recovered 6/25, no movement in 2004
0.540	U.S. Pleasant View Br.	98.60				92.10	92.60		Tag recovered 7/13, no movement after 4/19/04
1.420	D.S McGuire Gauge	100.70				95.00			Tag recovered 7/13, no movement in 2004
0.110	D.S. McGuire	100.70			100.70	100.70			Tag recovered 7/29, no movement in 2004
1.650	D.S. Jacklin Seed	97.30				97.10	95.50	97.30	Tag recovered in dead fish on 7/29 at R.M. 93.0

As suggested by Parametrix (2004), the rate of entrainment of rainbow trout at the Spokane River HEDs, appears to be low. Out of the 45 fish tagged in the upper river study reach, only three (6.7%) are known to have passed downstream through at least one of the Spokane River HEDs. Two fish passed downstream of three projects after the 2003 spawning season, and were detected in the lower river study reach in the summer of 2003. The third fish (Tag Code 0.450) was detected at the Island Complex spawning area (RM 95) during the 2004 spawning season, but was detected about 10 miles downstream (near Planters Ferry) by June 11. While it was subsequently undetected on June 25, it was detected downstream of Upriver HED (about 1/4 mile upstream of the Avista building) on July 13 and 29. However, this fish exhibited no signs of movement while in the Upper Falls HED reservoir.

Although June and July surveys were not conducted in the lower river study reach, Tables D3 and D4 provide a summary of the seasonal distribution of radio-tagged fish through the 2004 spawning season.

### **SUMMARY OF PRE-SPAWNING, SPAWNING, AND POST SPAWNING DISTRIBUTION OF NOVEMBER-RELEASED FISH**

The following descriptions summarize movement behavior provided in the main report text, along with specific movements observed during the supplemental post-spawning surveys conducted in July 2004.

#### **Fish 0.110**

By March it had moved upstream to near the Post Falls HED powerhouse, occasionally moving between the south and north river channels, through the 2004 spawning period. By June, however, the tag was detected downstream near McGuire Road (RM 100.7), where the tag was recovered in a riffle area on July 29.

#### **Fish 1.420**

This tag was located downstream in Washington, in the Island Complex spawning area (RM 95.1) in March, although the lack of subsequent movements through the spawning period indicates that the fish may have died or lost its tag. The tag was recovered from this area on July 13.

#### **Fish 1.400**

This tag was detected about 13 miles downstream of the McGuire Road release point, to near Sullivan Road in June. It was again detected in in this same area on July 13 for the last time.

#### **Fish 1.950**

This rainbow trout apparently moved from the McGuire Road release location (RM 100.7) to the Harvard Road area during the spawning season, and back upstream to near the Pleasant View Bridge (RM 98.5) by June. This fish subsequently moved further upstream to near its release location by July 29. Although this fish was not observed during snorkeling efforts in the McGuire Pool, it appeared to move during the survey.

#### **Fish 0.540**

This fish moved from the Pleasant View Bridge area (RM 98.6) to Harvard Road (RM 92.1), where it remained through the spawning season. It was detected in eddy habitat upstream of Barker Road (RM 91.35) in June, where the tag was recovered on July 13.

**Table D3. Location of Lower River Study Reach Fish Released in March 2003, by Season, Through the April 2004 surveys.**

Tag	Release Site	Release Location (RM)	2003 Spawning Season	2003 Summer Season	2003 Fall Season	2004 Winter Season	2004 Spawning Season	Status as of 4/26/04
1.440	Old bridge Xing	72.37	70.50	70.40	70.40	70.40	70.30	Active fish at lower San Soucci
1.640	USGS Gauge	72.70	70.50	70.30	70.30	70.30	70.20	Active fish at lower San Soucci
1.340	Upper River Bend	68.50	68.30	68.40	68.40	68.40	68.30	Active fish at Riverbend Bar
1.700	Upper River Bend	68.50	70.10	68.60	68.60	68.60	68.70	Active fish at Riverbend Bar
1.380	Lower San Soucci	70.62	70.90	70.60	71.00	71.00	70.90	Active fish at San Soucci riverbend
1.360	Opposite Latah Ck	72.03	71.40	70.00	69.80	69.80	69.60	Active fish by T.J. Meenach Bridge
1.520	Upper San Soucci	71.32	71.40	67.40			64.10	Active fish near Rifle Club
1.460	Old bridge Xing	72.37	71.40	72.40	72.50	72.50	72.60	Active fish U.S. of Latah Ck confluence
1.320	Upper San Soucci	71.32	71.10	68.20	68.10	68.10	67.80	Active fish U.S. Treatment Plant
0.800	River Bend Bar	68.33	68.40					Assumed dead-Last detected 4/10/03
0.500	USGS Gauge	72.70	72.20					Assumed dead-Last detected 4/18/03
1.760	Treatment Plant	67.20	70.10					Assumed dead-Last detected 4/29/03
1.620	Old bridge Xing	72.37	72.20	73.60	73.70	73.70		Assumed dead-Last detected 4/9/04
1.780	River Bend Bar	68.33	71.40					Assumed dead-Last detected 5/21/03
0.560	Old bridge Xing	72.37	72.20	69.80				Assumed dead-Last detected 6/6/03
1.890	Below Bowl & Pitcher	65.65	65.60	65.40				Assumed dead-Last detected 8/7/03
1.680	Below Bowl & Pitcher	65.65	64.00	64.20	64.00	64.00		Assumed dead-Last movement 3/13/04
1.510	Opposite Latah Ck	72.03	72.00	71.60	71.60			Assumed dead-Last movement 3/18/04
1.600	Below Bowl & Pitcher	65.65	65.60	65.50	65.30	65.30		Assumed dead-Last movement 3/18/04
1.000	Springs above T.J.M.Br.	69.93	65.80					Assumed dead-Last movement 4/4/03
1.500	Lower San Soucci	70.62	71.00	70.90				Assumed dead-Last movement 6/23/03
0.600	Lower San Soucci	70.62	71.00	70.80				Assumed dead-Last movement 7/24/03, Tag on shore
1.720	Upper River Bend	68.50	70.10	69.50				Assumed dead-Last movement 7/9/03
0.580	Opposite Latah Ck	72.03	71.80	66.20				Assumed dead-Last movement 8/20/03
1.660	Below Bowl & Pitcher	65.65	65.60	65.40				Assumed dead-Last movement 8/20/03
1.740	Upper River Bend	68.50	69.60	69.50				Assumed dead-Last movement 9/4/03
1.800	Treatment Plant	67.20	73.50					Last movement 5/21/03, tag recovered 3/13/04
1.400	Springs above T.J.M.Br.	69.93	69.60					Last movement 8/7/03, tag recovered 9/4/03
1.420	Upper San Soucci	71.32	66.90					Last movement 4/03, tag recovered 10/29/03

**Table D4. Location of Lower River Study Reach Fish Released in November 2003, by Season, Through the April 2004 surveys.**

Tag	Release Site	Release Location (RM)	2003 Spawning Season	2003 Summer Season	2003 Fall Season	2004 Winter Season	2004 Spawning Season	Status as of 4/26/04
1.630	Lower San Soucci	70.70			70.70	70.20	70.60	Active fish at lower San Soucci
0.570	Old bridge Xing	72.33				68.40	68.40	Active fish at Riverbend Bar
1.570	T.J. Meenach ramp	69.60					68.40	Active fish at Riverbend Bar
0.490	Released bend D.S. of Latah Ck	71.80				70.80	71.10	Active fish at San Soucci riverbend
1.610	Lower San Soucci	70.70				71.80	71.85	Active fish D.S. of Latah Ck confluence
1.670	D.S. Pleasant Valley Put-in	73.10			73.10	73.10	73.00	Active fish D.S. of put-in
1.710	Old bridge Xing	72.33			72.33	72.50	73.20	Active fish D.S. of put-in
0.320	D.S. Pleasant Valley Put-in	73.10				73.10	73.20	Active fish downstream of put-in
0.180	D.S. Pleasant Valley Put-in	73.10				73.10	72.80	Active fish near Latah Ck confluence
0.620	Old bridge Xing	72.33				72.55	72.50	Active fish U.S. of Latah Ck confluence
0.550	Released at lower San Soucci	70.70				68.50	67.80	Active fish U.S. Treatment Plant
1.300	Old bridge Xing	72.33				68.40	68.40	Assumed dead-No obvious movements in 2004
1.480	T.J. Meenach ramp	69.60				67.00	66.20	Unknown status-Last movement 3/30/04

**Fish 0.310**

This fish exhibited limited movement after tagging, and the tag was recovered about 0.5 miles downstream from its release location on June 25.

**Fish 1.530**

This rainbow trout was detected about 12 miles downstream of its release location, to near Trent Bridge (RM 85.5), and remained in this area through the 2004 spawning season. No subsequent movements were observed of this fish, and the tag was recovered from this same area on June 25.

**Fish 1.590**

This rainbow trout was detected near its release location (RM 98.3) in mid-April, although no spawning was observed in the areas occupied by this fish during the spawning season. The fish was detected in this same general area through July, and neither the tag nor the fish was observed during snorkeling efforts in July.

**Fish 1.650**

This rainbow trout moved about 2 miles downstream from its release location by early April, to near the Island Complex spawning area (RM 95.5). After the spawning season, the fish gradually moved back upstream to near its release location in June. However, the dead fish was recovered about 5 miles downstream (near Harvard Road) on July 29.

**Fish 1.690**

This remained within 0.5 miles of its release location through the 2004 spawning season, and was also located in this same area on July 29. Although and neither the tag nor the fish was observed during snorkeling efforts in July, the fish appeared to be alive and moving.

**Fish 0.280**

This fish was located about 10 miles downstream of the release location (in Mirabeau Pool), in January, and gradually moved about 8 miles upstream to Simpson Bar during the spawning season. It was located back in the Mirabeau Point pool area by June, and remained in this area through the last survey on July 29.

**Fish 0.300**

This rainbow trout moved over 10 miles downstream of the release location, to the Mirabeau Point pool area (RM 86.3) by March, and moved about 0.6 miles upstream (to near Sullivan Road) in April. It moved about 3 miles upstream, to the upper end of Flora Rapids, where it was last detected on June 11.

**Fish 0.450**

This rainbow trout moved about 2 miles downstream of its release location, to the Island Complex spawning area (RM 94.5-95.0) during the spawning season. By June 11 it was detected about 10 miles downstream near Plantes Ferry (RM 84.4), but was undetected on June 25. It was subsequently detected downstream of Upriver HED, but exhibited no movements during July to indicate that it was still alive.

**Fish 0.720**

This fish moved about 2 miles downstream of its release location during the spawning season, to the Starr Road Bar spawning area (RM 94.8), and back to near the release location by June 25. While it was detected in this area in July, it was not observed during snorkeling surveys.