

Geotechnical
Environmental and
Water Resources
Engineering

Final Report

Fish Behavior in the Tailrace of Thompson Falls Dam

Results of 2005 Radio Telemetry

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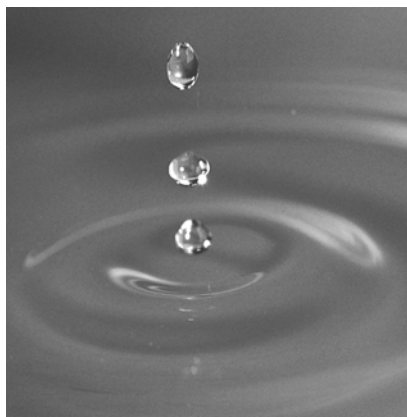


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Montana

Executive Summary

The 2005 study year was very successful at monitoring fish behavior in the Thompson Falls Dam project area. In all, a total of 34 radio tagged fish were monitored in the project area from April 14 to December 31, 2005. Of these 34 fish, 6 were bull trout. All bull trout that were observed by the telemetry stations made at least one foray to the main channel dam area. Of 34 the tagged fish recorded in the project area, 33 were documented to have made at least one foray to the main channel dam.

Although the data set is small, we did not see any differences in behavior between bull trout with differing tributary origins. Similarly, we saw no obvious differences in behavior between radio tagged fishes that were originally captured in the Thompson Falls fish trap versus other methods of capture.

We were able to evaluate fish behavior in relation to flow for the 2005 season. Data indicate that fish may be responding to project operations and are especially affected once the project begins to spill. Fish that were in the project area prior to spill seemed to be triggered to migrate upstream to the main channel dam area once the main channel dam flashboards were opened. Additionally, fish remained in the main channel dam tailrace area even when spill exceeded 27,000 cfs.

In concurrence with past fish trap data, we believe that the data collected during 2005 gives further support for the main channel dam area as a option for a future permanent fish passage facility.

The 2006 study season will be used to further evaluate the optimal location for an entrance to a fish passage facility at the main channel dam area. Data from 2005 indicate that the behavior of fish residing in the tailrace are affected by the spill regime. Thus, by manipulating the flashboard operations at the main channel dam in 2006 we will be better able to distinguish the optimal location for fish to hold and hence place an entrance ladder.

1.0 Introduction

The overall objective of the 2005 telemetry study was to gather additional fish behavior data to determine the appropriate location for a future fish passage facility at Thompson Falls Dam. The 2005 data was used to distinguish between the three main areas of the Thompson Falls project area (main channel dam, Dry channel dam, and the powerhouse tailraces).

Since the steep pass fish ladder in the left bank (looking downstream) area of the main channel dam tailrace has been in operation, many rainbow trout (*Oncorhynchus mykiss*), westslope cutthroat trout (*O. clarki lewisi*), a few bull trout (*Salvelinus confluentus*), and various other game and nongame fishes have been captured. Therefore, it was understood that at least some migratory fish that entered the project area headed upstream into the vicinity of the main channel dam. However, the extent to which fish performed this behavior was not known. For that reason, we evaluated tagged salmonids to determine the extent that fish moved into the three main locations of the Thompson Falls Dam to better understand if a fish passage facility at the most upstream terminus would be available to a majority of the fish migrating into the project area.

Various fisheries research activities were performed during 2005 at Thompson Falls Dam, which included the set up and use of stationary telemetry receivers, radio tagging of salmonids using coded radio telemetry tags, the use of the Thompson Falls fish trap, electrofishing in the Clark Fork River, gill netting in Thompson Falls Reservoir, angling, and manual tracking of the movement of tagged fish below Thompson Falls Dam. Of those activities, this report details the results of the remote telemetry research, for the purpose of addressing the optimum location for a fish passage facility.

In addition to PPL Montana's tailrace telemetry study, Avista Corp. transported 18 radio tagged bull trout over Noxon Rapids Dam during 2005. PPL Montana and Avista collaborated so that the remote telemetry stations at Thompson Falls could detect those bull trout if they migrated into the project area. Therefore, telemetry data from 2005 consisted of both PPL Montana tagged salmonids and any Avista tagged bull trout that may have entered the project area.

2.0 Methods

2.1 Radio Telemetry Equipment

Digitally encoded radio transmitters (model MCFT-3FM and MCFT-3BM, Lotek Engineering, Newmarket, Ontario Canada) used in the study and transmitted signals on one of three frequencies (148.300, 148.640, and 148.740 MHz). The two models of radio tags were cylindrical with a 300 mm whip antennae. Two sized tags were used during 2005. The MCFT-3FM weigh 10.0 g out of water, are 11 mm in diameter, 59 mm in length, and have an approximate operational life of 560 days at the set burst rate of 5 seconds. The smaller MCFT-3BM weigh 7.7 g out of water, are 11 mm in diameter, 43 mm in length, and have an approximate operating life of 278 days at the set burst rate of 5 seconds.

In all a total of six telemetry receivers were used at Thompson Falls Dam during 2005. Three were set to record the presence of PPL Montana's tagged fish and three were set to record the presence of Avista's tagged bull trout moved over Noxon Rapids Dam. The six receivers were manufactured by Lotek and were Model SRX_400. Each receiver was programmed with Code_Log Version 4.2x W31 software and equipped with 64k data storage memory. Whenever a signal was detected, the receiver recorded the starting date and time, channel, code, antenna, power level, number of events, and stop date and time for that particular coded signal. The six receivers were kept in weatherproof enclosures and connected to a deep cycle 12 Volt battery (Sun Xtender Series, Concorde Battery Corporation) and an 80-Watt solar panel (Model SW90, SunWize® Technologies) with a solar controller (Model Sunsaver-10, Morningstar). All receivers were connected to cellular modems allowing data to be downloaded from a distant location.

Nine-element and four-element Yagi antennae were used at the fixed monitoring locations. The antennae arrays were grouped together at the main channel dam and wingwall areas and separated at the hilltop. All antennae arrays were linked to two receivers and scanned sequentially. Antennas on the main channel dam and the wingwall were mounted on a stand built of 4"x4" treated wood and bolted down into the concrete deck. The hilltop antennas were mounted using large wooden poles supported by plastic covered cable.

2.2 Monitoring System Design

The movements of radio tagged salmonids released below Thompson Falls Dam were determined using three fixed monitoring stations. A monitoring station was established on the wingwall off the old powerhouse, the hilltop of the island between the new powerhouse and the Dry channel dam, and on the main channel dam. Each monitoring station consisted of two telemetry receivers (one for PPL tagged fish and one for Avista tagged fish), which were connected to one antennae array. Dummy transmitters were used to validate the identification of transmitters in the desired areas at all stations. Occasionally more than one antenna identifies a transmitter at a given time. In this event, the power of the signal was used to identify what area a fish was residing in a specific area at a given time. Each antenna

had a specific identifying number or letter to distinguish what specific antenna was receiving signals. A schematic of the Thompson Falls project area with the telemetry configuration is found in Figure 1.

Data from the receivers were automatically downloaded via cellular modems on a daily basis to a server computer in GEI's Bozeman, Montana office. All data were then entered into a database and post processed. The post processing consisted of using an algorithm to assign a signal to a specific antenna. Since many antennas at one station could receive an individual signal during an individual time interval, it was necessary to distinguish where the signal was the strongest. Therefore, the algorithm decided what antenna had the signal and what antenna it was strongest on during a fifteen-minute interval. In this manner only the signal is assigned to only one antenna for each fifteen-minute interval. This greatly helped with data analysis, since a multitude of data that are generated when a signal is being read on numerous antennas during a time period. Furthermore, making the decision of what antenna had the strongest signal in a given time period can be very laborious if conducted manually.

Additionally, PPL Montana's operations and flashboard data for Thompson Falls Dam were automatically downloaded to GEI's server. This allowed for simultaneous analysis of flow and fish data for each area of the project. For this analysis, flow was broken into three general areas, flow through the new and old powerhouses (wingwall), flow in the form of spill at the Dry channel dam, and flow in the form of spill at the main channel dam. Furthermore, since the flashboard configuration at both dams was recorded, we also evaluated where spill was occurring at the main channel dam, allowing us to evaluate where fish were holding at the main channel dam during the 2005 spill regime.

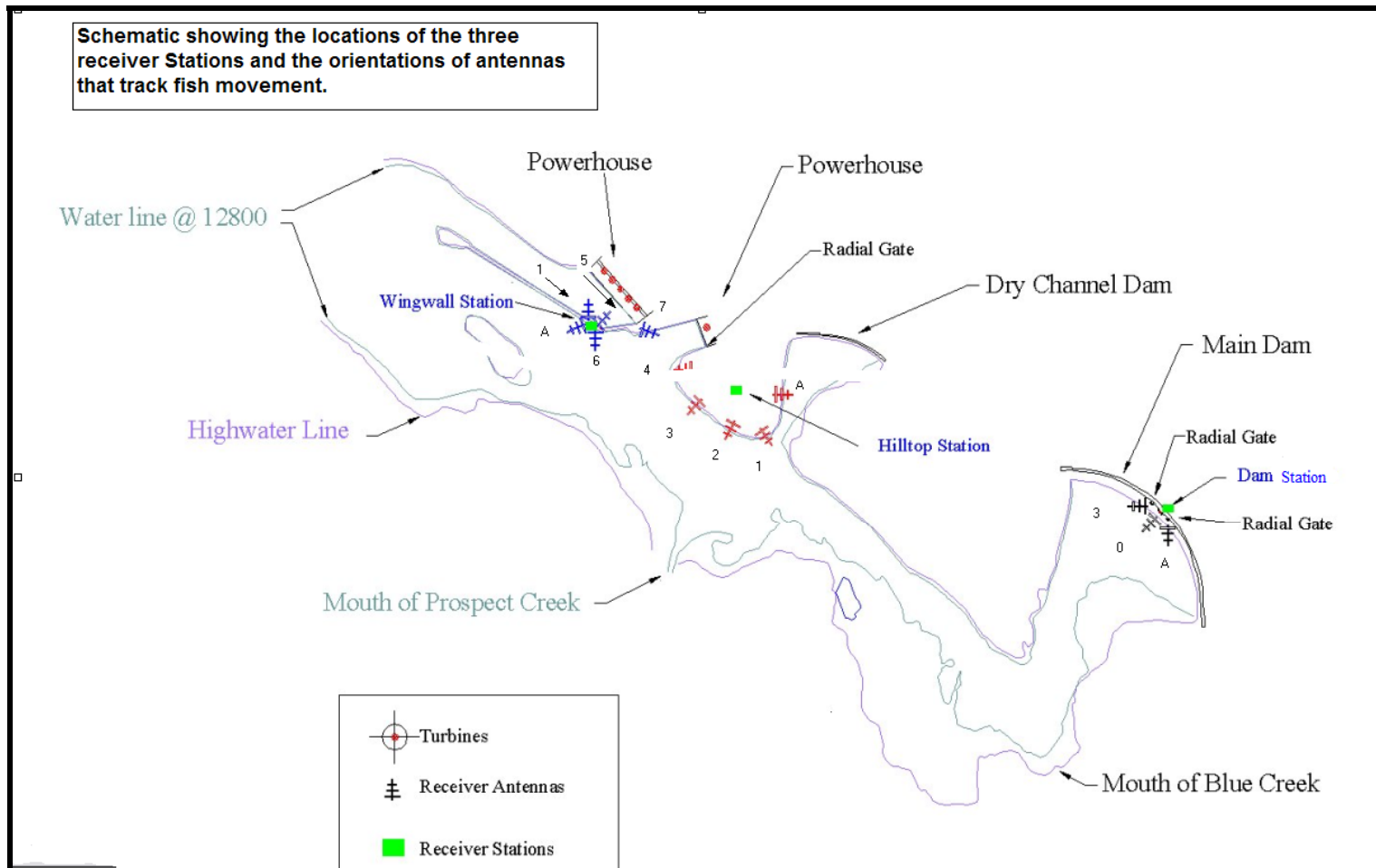


Figure 1. Schematic of Thompson Falls project area; indicating the location of the two powerhouses, two dams, three radio telemetry stations, and the direction coverage of all antenna

3.0 Results

Of the 42 trout tagged by PPL Montana in 2005, 25 returned to the project area after release in 2005. Only one of these 25 trout was tagged in the fall. Therefore, 24 of 28 trout tagged in the spring of 2005 returned to the project area after release in 2005. In addition, five bull trout tagged by Avista were detected in the project area, and three trout tagged in 2004 (including one bull trout) were detected in the project area. In total, 34 radio tagged salmonids were recorded on the remote telemetry array at Thompson Falls Dam between March 1 and December 31, 2005.

This count only includes fish that had multiple recordings on the telemetry arrays, in other words, fish that were only recorded for a brief time period were not analyzed due to the possibility that the receivers had in actuality recorded noise instead of an actual tagged fish. In addition, surgeries to install transmitters in fish collected in the trap were performed at the trap – within range of the antennae on the main channel dam. These detections were removed from the data set.

Of the 34 fish that entered the project area, all 34 were recorded by the hilltop station, 33 were detected by the wingwall station, and 28 were recorded at the upstream terminus near the main channel dam. There were six fish recorded in the project area that were not detected by the stationary receivers at the main channel dam. However, five of these six fish were initially collected at the trap, which is located near the left bank of the main channel dam. Therefore, these five fish made at least one foray to the main channel dam. Only one rainbow trout, initially caught electrofishing, was detected in the project area but not documented to make a foray to the main channel dam.

Of significance is the fact that all six bull trout that were recorded in the project area were recorded at the main channel dam, including five Avista transported bull trout.

The PPL Montana-tagged trout that returned to the project area after tagging and release spent, on average, four days returning to the project area after release. There were five trout that returned to the project area the same day after they were released into Noxon Reservoir. The longest time to return to the project area was 41 days.

During the 2005 season, the fish trap was operational up until spill occurred and then again for a short period of time in July, August, September, and October. Although the trap was operated for a few days in May after spill occurred, no trout were captured after spill began. The capture of trout at the fish trap is depicted in Figure 2.

2005 Thompson Falls Fish Trap Capture Data

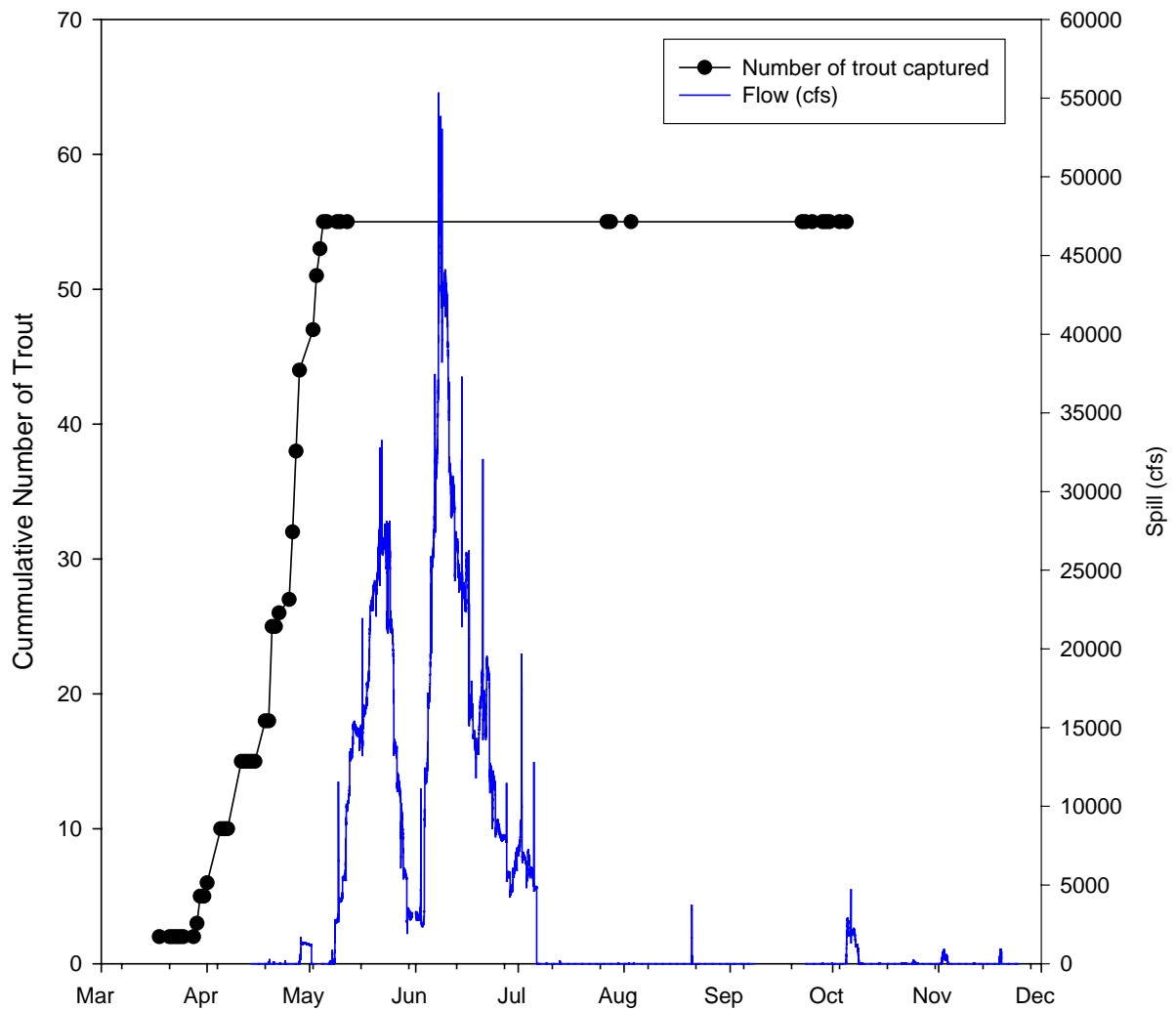


Figure 2. Cumulative number of combined trout (westslope cutthroat, rainbow, brown, and westslope cutthroat x rainbow trout hybrids) captured by date at the Thompson Falls Dam fish trap during 2006. Project spill, i.e. flow in excess of plant capacity which passed over the spillways, is indicated by the blue line and the right Y-axis.

Fish captures in the Thompson Falls fish trap followed a similar pattern during 2004 (Figure 3). As was the case during 2005, most fish were captured in the month prior to spill. The trap was removed in 2004 with the onset of spill at the Thompson Falls Dam.

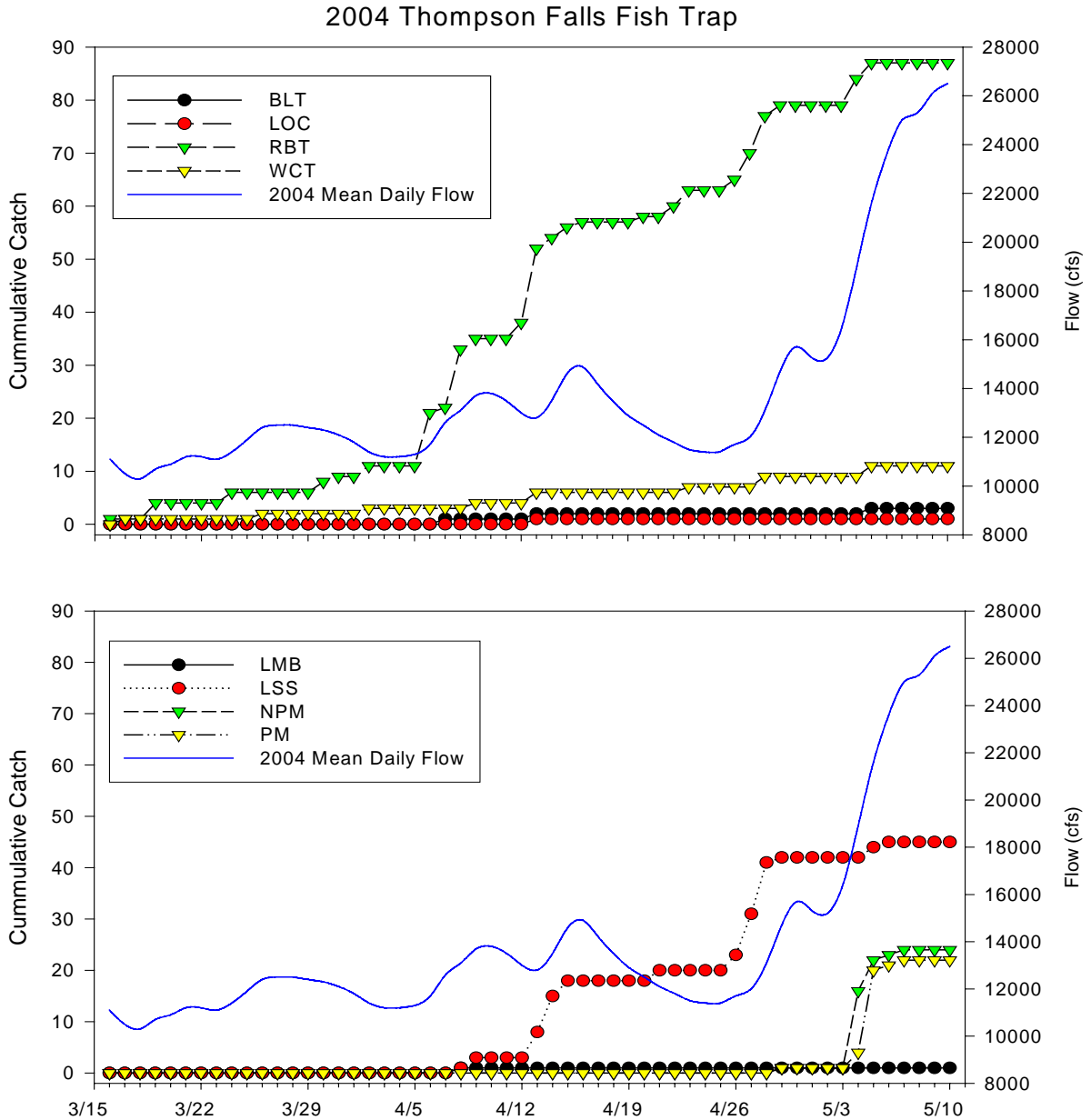


Figure 3. Cumulative catch for bull trout (BLT), brown trout (LOC), rainbow trout (RBT), and westslope cutthroat trout (WCT) (upper pane) and largemouth bass (LMB) large scale sucker (LSS), northern pike minnow (NPM), and peamouth (PM) (lower pane) at the Thompson Falls Fish Trap during 2004. Flow (mean daily flow of Clark Fork River at Plains, MT reported by the USGS) is represented by the blue line and the right Y-axis'.

3.1 Total Telemetry Histories

During 2005, PPL Montana implanted coded radio tags in one bull trout, two brown trout, nine westslope cutthroat trout, 28 rainbow trout, and two westslope cutthroat trout-rainbow trout hybrids for a total of 42 salmonids that were used in the analysis. In addition, all 18 bull trout transported over Noxon Dam by Avista had the potential to be recorded at the remote telemetry stations at Thompson Falls Dam.

The following analysis discusses the movements of tagged fish in the project area with the representative graphics.

During 2005 the majority of telemetry hits occurred at the remote stations from March 26 to July 16 (Figure 4). After July 16 the total hits decreased significantly. The first fish tagged in 2005 was on March 18.

2005 All Telemetry Hits For All Stations By Date

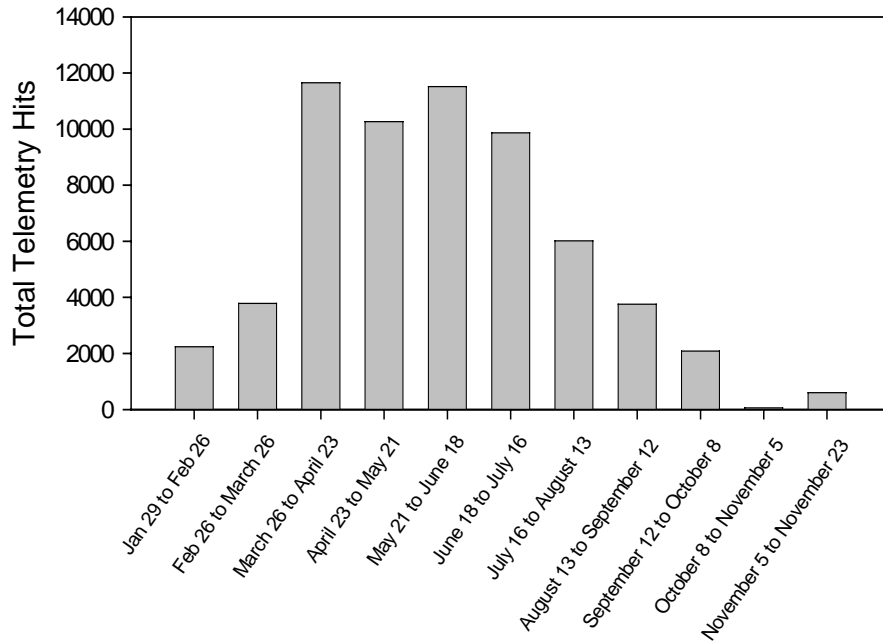


Figure 4. The total number of 15 minute time intervals when signals were recorded by the remote telemetry receivers at Thompson Falls Dam during 2005.

Overall, the hilltop station, which includes the mouth of Prospect Creek, had the largest proportion of total hits during 2005. The main channel dam station had the second highest proportion of hits, while the wingwall station had the least number of telemetry hits (Figure 5).

The number of fish that were detected on each antenna is displayed in Figure 6. The antenna on the hilltop pointing towards the area upstream of the mouth of Prospect Creek detected all 34 fish that entered the project area (100% of fish in project area). The antenna on the left of the main channel dam detected the fewest number of fish (22). It is clear from this graph that most of the fish were detected by most of the antennae. This indicates that when fish enter the Thompson Falls Dam tailrace they generally tend to explore many locations.

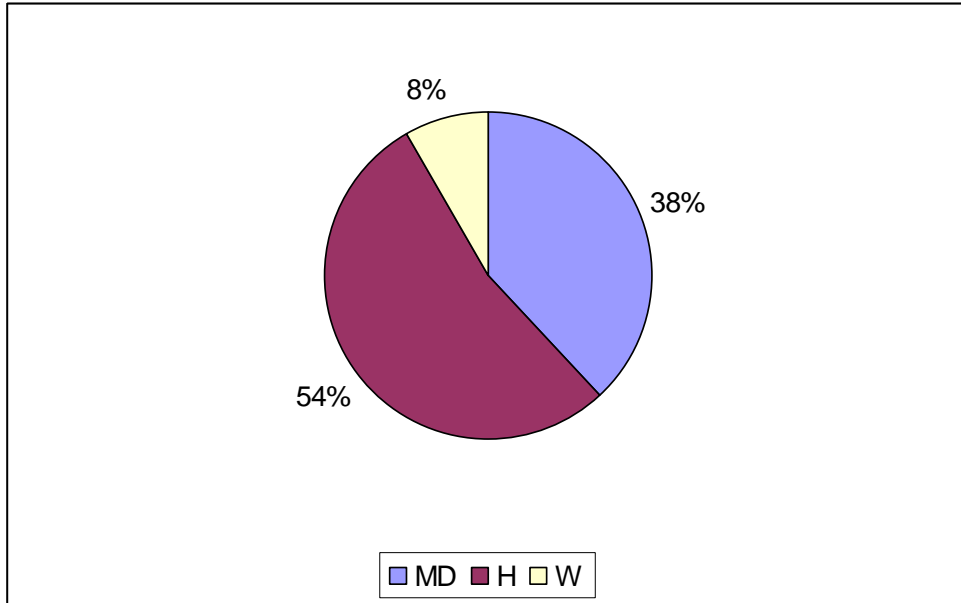


Figure 5. Total telemetry hits by proportion for the three remote telemetry stations at Thompson Falls Dam during 2005. MD = main dam, H = hilltop, W = Wingwall.

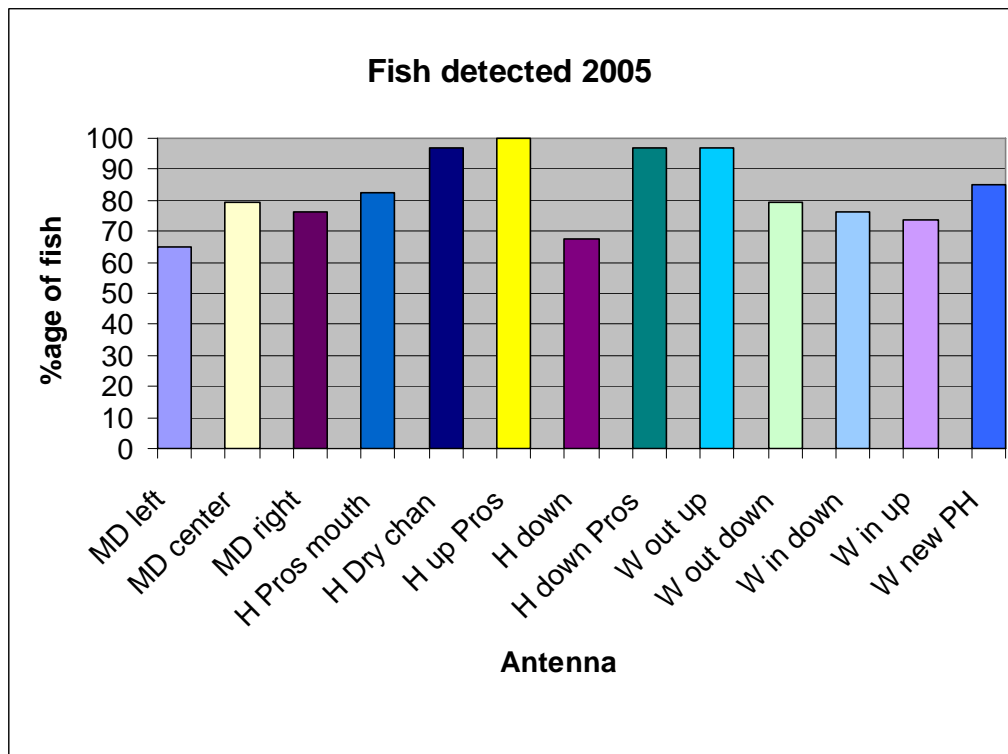


Figure 6. The percentage of the total number of fish in the project area detected on each antenna.

Although fish tend to explore the overall project area, there are certain distinct areas where they spend most of their time. The number of hits on each antenna for the entire 2005 study season is depicted in Figure 7. The hilltop antenna pointing towards the area upstream of the mouth of Prospect Creek and the hilltop antenna pointing toward the Prospect Creek mouth had the greatest number of hits. The main dam center and main dam left also received a large number of hits.

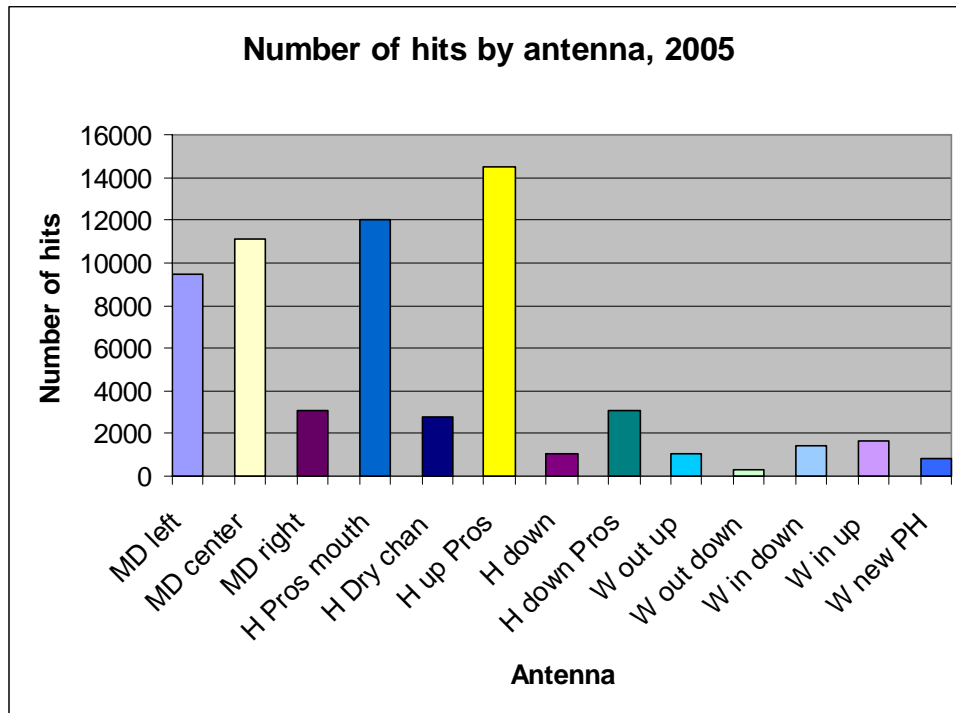


Figure 7. Number of hits on each antenna March 1, 2005 – December 31, 2005. MD = main dam, H = hilltop, W = Wingwall.

Fish behavior varied by species. During the 2005 season, bull trout were most often detected at the hilltop station, while they were detected the least at the wingwall station (Figure 8). Westslope cutthroat trout had the highest number of telemetry hits at the main channel dam station, and again were least often detected at the wingwall station. Similar to bull trout, rainbow trout were most often detected at the hilltop station.

All Hits, By Species and Station
January 1 to November 23, 2005

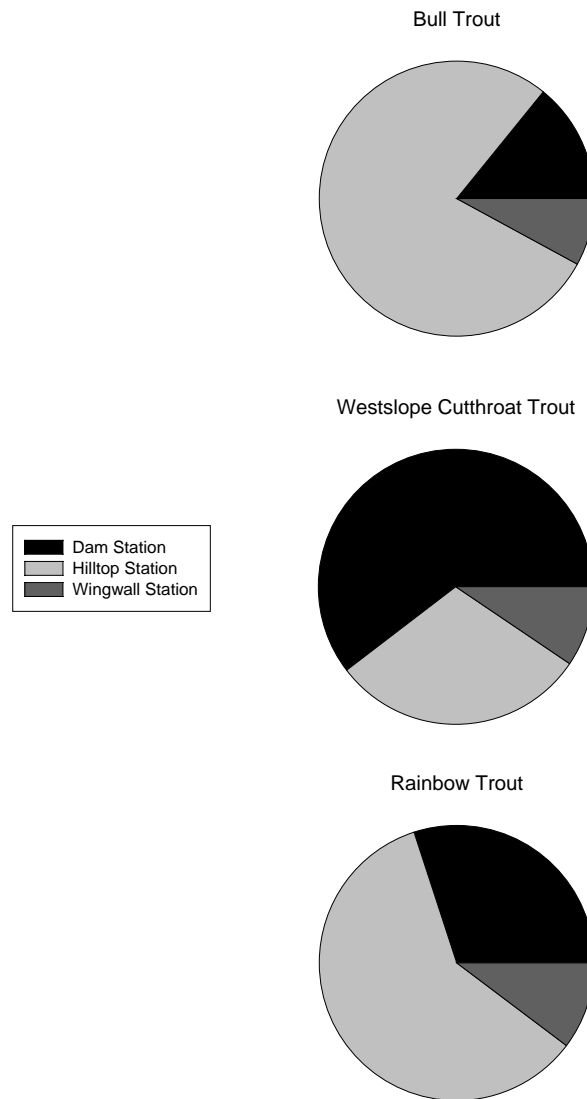


Figure 8. Telemetry hits by station for bull trout, westslope cutthroat trout, and rainbow trout at Thompson Falls during 2005.

When evaluating the total telemetry hits by station through time, it is apparent that tagged fish move throughout the project area and are more prominent in certain areas at different times (Figure 9). It is important to note that total fish hits was quite low until the March 26 to April 23 time period. Any fish detected before March 18, 2005 was tagged during 2004. It appears that when fish first move into the project area, they do spend time around the wingwall station and through time decrease their use of that area.

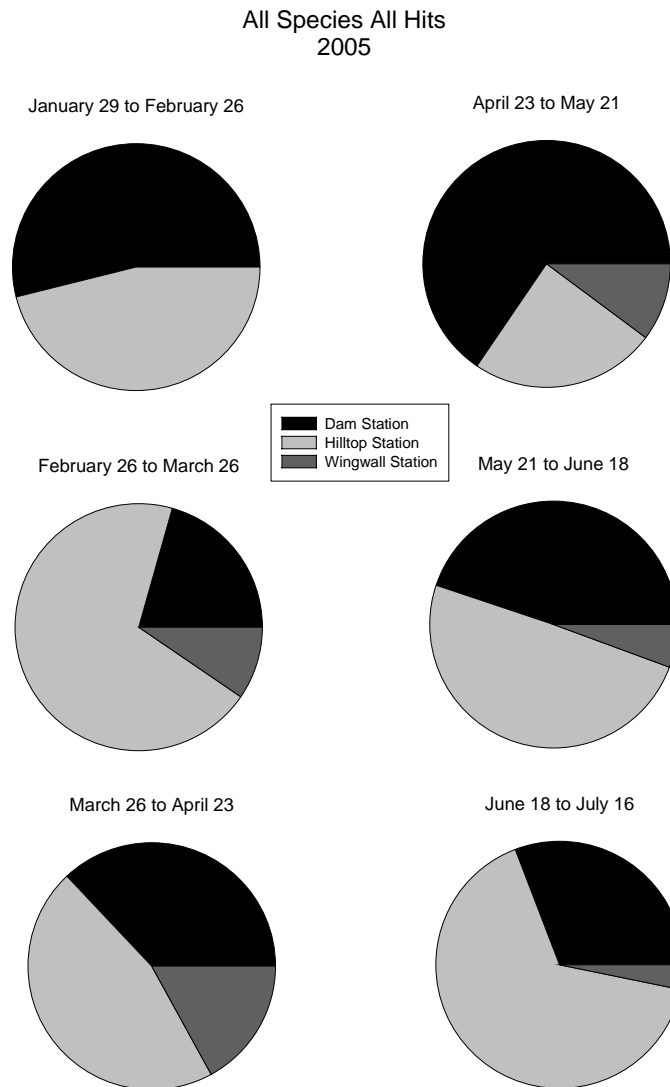


Figure 9. Total telemetry hits for all three remote stations through time, 2005.

By June, very few detections were occurring at the wingwall station. The greatest proportion of hits that occurred at the main channel dam station was from April 23 to May 21. From April 23 to August 23 a relatively high proportion of detections continued to be monitored at the main channel dam station (Figure 10).

From mid-September to the beginning of November, few detections occur at either the main channel dam or the wingwall station. From November 5 to November 23 the proportion of hits at the main channel dam station began to increase again.

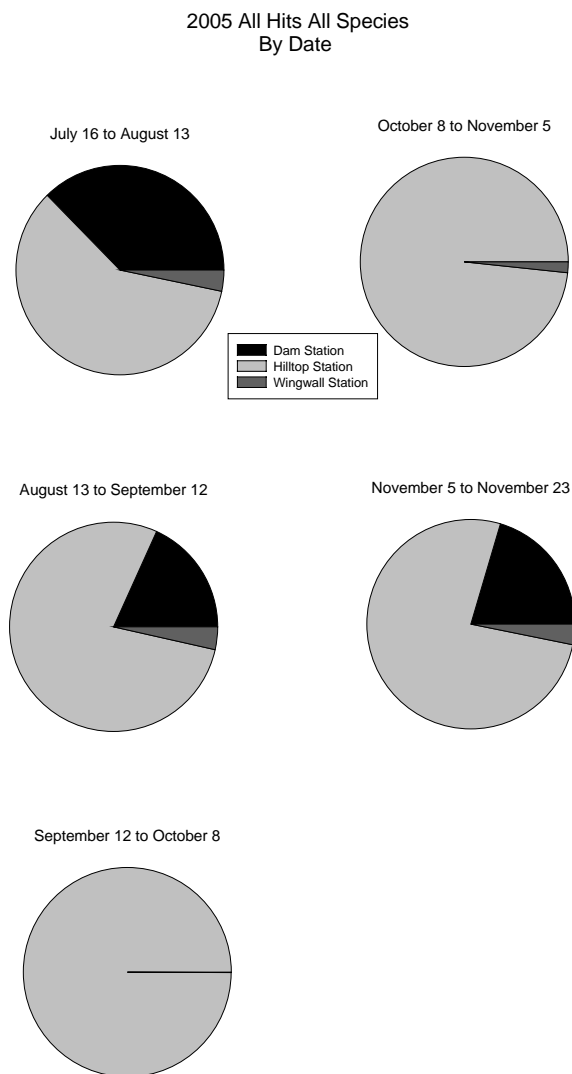


Figure 10. Total telemetry hits for all three remote stations through time, 2005

When just evaluating the main channel dam station, it is apparent that the greatest proportion of telemetry hits occurred at the middle antenna. The left bank had the second highest telemetry hits, while the right bank had the fewest (Figure 11).

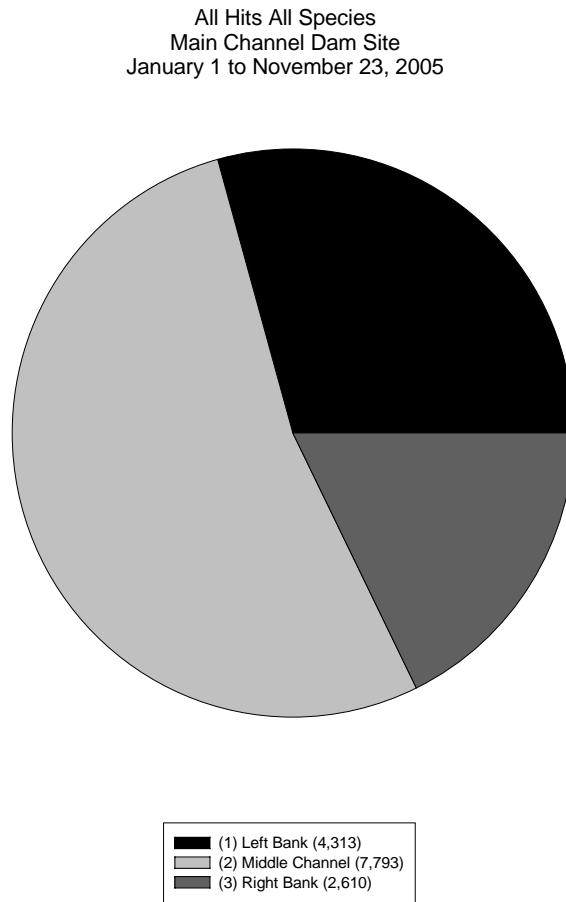


Figure 11. Proportion of hits at the main channel dam station separated by positioning on the dam.

For the hilltop station, the area just upstream of Prospect Creek had the highest proportion of hits, while the Prospect Creek mouth area had the second highest proportion of hits (Figure 12). Relatively few hits occurred in the area of the Dry channel dam tailrace.

All Species All Hits, Hilltop Station
January 1 to November 23, 2005

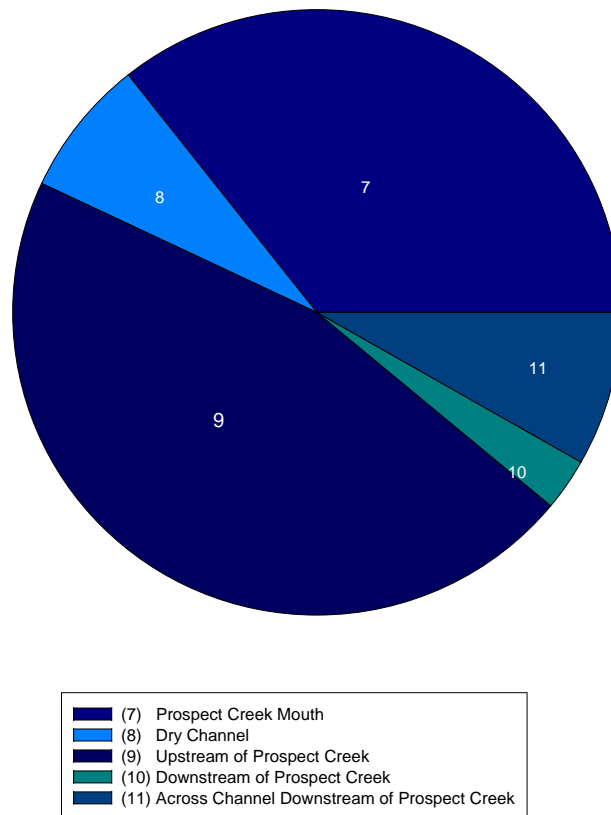


Figure 12. Proportion of telemetry hits for the hilltop station, separated by location.

The greatest proportion of hits at the wingwall station were in the area of the Old Powerhouse, inside the wingwall and immediately adjacent to the old powerhouse (Figure 13). The area inside the wingwall adjacent to, but downstream of, the old powerhouse had the second highest proportion of hits for the wingwall station. Few fish that were migrating up the Clark Fork River downstream of the wingwall were detected by the antenna facing downstream on the outside of the wingwall.

All Hits All Species
Wingwall Station
January 1 to November 23, 2005

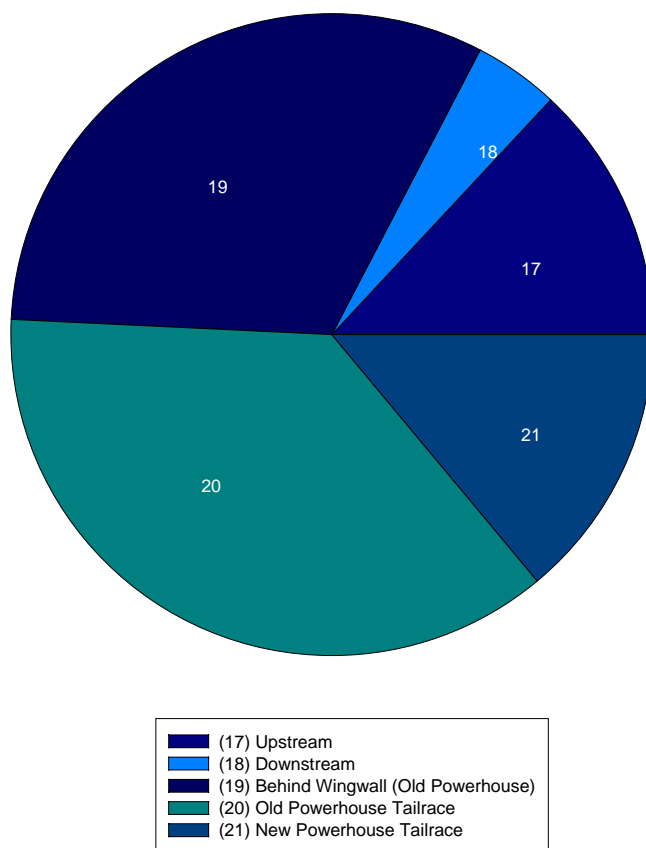


Figure 13. Proportion of all hits occurring for all species at the wingwall station during 2005.

When comparing the total telemetry hits for all species with flow during 2005, it is apparent that fish in the project area are attracted to the main channel Dam area when spill begins to occur (Figure 14). Before spill, the majority of hits occurred at the hilltop station. However, once spill began, the proportion of telemetry hits at the main channel Dam area significantly increased. This pattern was true until spill reached about 20,000 cfs. At that time, although some fish were still present in the main channel Dam area, the total amounts of hits decreased. It is also apparent that when the main channel Dam is spilling over 25,000 cfs, fish are still able to hold in the area, although more fish descend to the hilltop area.

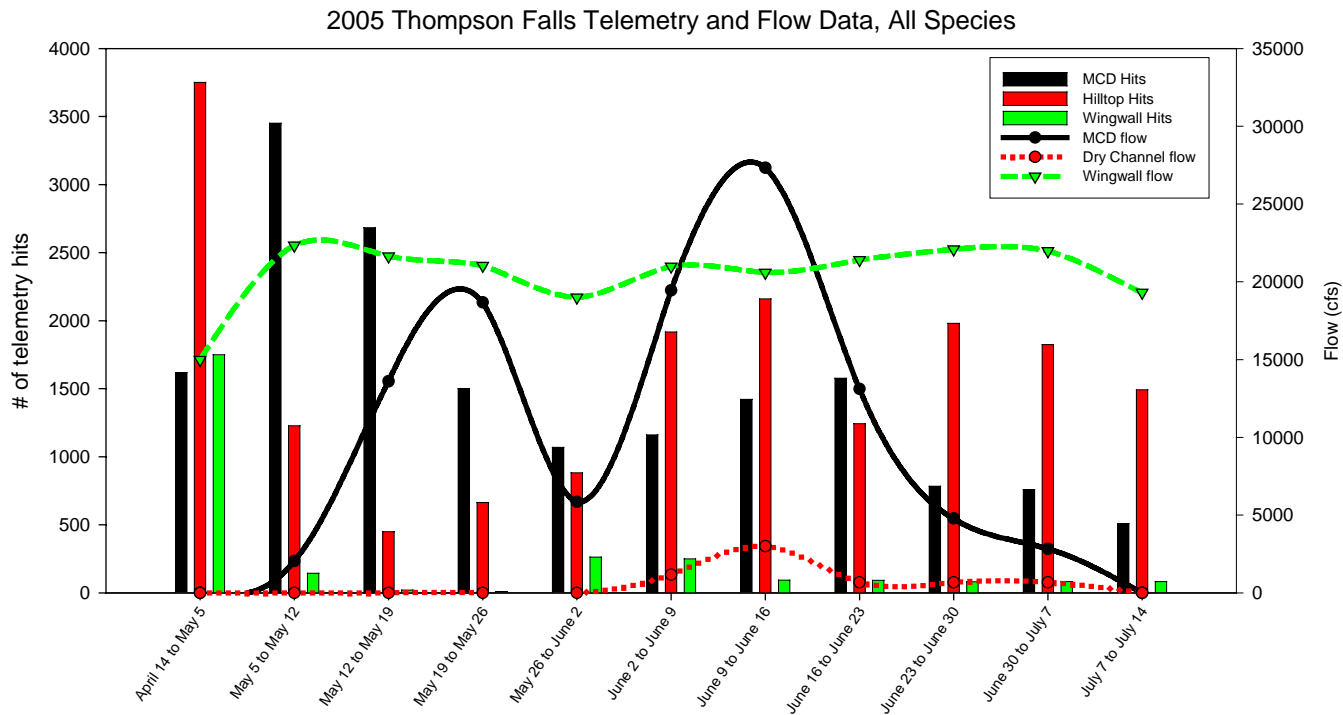


Figure 14. Number of telemetry hits for all species detected in 2005 at the three remote stations at Thompson Falls Dam and the vicinity where flow was occurring in the project area.

3.3 Bull Trout

When evaluating the total bull trout hits throughout the project area and project flow, it is evident that bull trout are attracted to the flow sources. Early in the season (April 14 to May 5) before spill has occurred, the majority of bull trout hits occurred near the wingwall station (Figure 15). Once spill began to occur at the main channel Dam bull trout began moving into that area. Subsequently, when spill at the main channel Dam exceeded 20,000 cfs bull trout tended to move back into the hilltop area. Then, once spill at the main channel dam began to subside to around 15,000 cfs, bull trout began to move back into the main channel dam area again. It is also important to note that when spill at the main channel dam reached 20,000 spill also began to occur at the Dry channel dam.

The timing of individual bull trout presence in the project area is depicted in Figure 16. Bull trout were primarily present in the project area in the summer months. The one exception to this was bull trout 148.640 code 7. This fish was in the project area in March and April. This was the only bull trout monitored in 2005 that was tagged in 2004.

Most (five) of the bull trout tracked in 2005 were fish Avista transported into Noxon Reservoir. Four of these fish were placed in Noxon Reservoir at the end of May 2005, and one was transported at the end of April 2005. It would not have been possible for these fish to have been detected prior to transport, so the presence of the fish in the project area in June and July is logical. Hopefully, some of these fish will return to the project area in 2006 so that we can monitor the initial timing of their upstream movements.

Complete information on Avista's 2005 bull trout transport and manual tracking can be acquired directly from Avista, who sends this information out on a weekly basis during the tracking season to both MFWP and USFWS. The abbreviated version below is to lend further information that is pertinent to the 2005 Thompson Falls radio tracking study.

During 2005, Avista released 18 bull trout upstream of Noxon Dam. Of those 18 bull trout, five were confirmed at Thompson Falls Dam by the remote telemetry arrays. Below is a short description of when the individual fish were released, where the release occurred, and when they were first detected at Thompson Falls Dam. In addition, there is a short description of what stations detected the bull trout and the approximate date when they were no longer detected by the telemetry stations.

Avista bull trout 1148 (radio tag 149.440 code 104, female, 550 mm in length) was released on April 29, 2005 at Vermillion River Bay, was first detected at the Thompson Falls Dam area at the hilltop station on May 29, 2005. It made its way to the main channel dam on May 30. This fish made multiple forays between the hilltop and the main channel dam (center antenna) until October 14 when the tag was retrieved from the little cove to the left of the mouth of Prospect Creek. The evidence of when this fish died is inconclusive. Mobile tracking done by Avista noted that the fish showed movement through 7/30 and then moved up to the hilltop station on

7/31. They did not observe much movement after this point; however, it may have been holding in the cooler water found at the mouth of Prospect Creek (personal communication, Hintz). The stationary receivers detected this fish on two antennae at the hilltop station from July 31 to October 14. The fish could have been moving in a small area during this time, or the fish could have been dead and the transmitter located in an area where two antennae could receive the signals.

Avista bull trout 0724 (radio tag 149.460 code 141, male, 759 mm in length) was released on May 27, 2005 in the Vermillion River near the river mouth. It was first detected at the Thompson Falls Dam area at the hilltop station on May 30, 2005. It made its way to the main channel dam site (center antenna) on the same day it entered the project area. As with the previous fish, this bull trout made multiple forays to the main dam (mostly detected on the center antenna) from the hilltop area. It was last detected at the main dam on July 18. This fish also made multiple forays to the inside and outside of the wingwall between May 30 and June 24. It was then detected off and on at the hilltop until its last detection on September 10, 2005.

Avista bull trout 8292 (radio tag 149.440 code 33, male, 615 mm in length) was released on May 25, 2005 in the Vermillion River near the river mouth. It was first detected at the Thompson Falls Dam area on May 30, 2005, when it moved around the project area and was detected at all three remote stations including the main channel dam station. This bull trout was only detected in the project area for one day.

Avista bull trout 3873 (radio tag 149.460 code 131, male, 765 mm in length) was released on May 25, 2005 in the Vermillion River near its mouth. It was first detected at the Thompson Falls Dam area on the hilltop station on May 30, 2005. It moved inside and outside the wingwall and upstream towards the mouth of Prospect Creek until June 4, when it made a foray to the main channel dam (center antenna). It moved between the main channel dam and the hilltop (mostly upstream of Prospect Creek) between June 4 and June 23. From June 23 to August 11 it was detected in the area of the mouth of Prospect Creek. After August 11 the fish was not detected in the project area except for some detections on September 25, 2005.

Avista bull trout 3019 (radio tag 149.440 code 103, female, 777 mm in length) was released in the Vermillion River near its mouth on May 25, 2005. It was first detected at the Thompson Falls Dam area on May 30, 2005 on the hilltop station. It made a forays to the main channel dam June 3 - 5 and then went back to being detected on the hilltop station. It made additional forays to the main channel dam from the hilltop area between June 16 – 23. It then left the project area on June 23 and was not detected again until August 21. Between August 21 and August 19 this bull trout was near and downstream of the mouth of Prospect Creek and in the channel near the new powerhouse. The fish then left the area again on August 29 and was not detected again on the remote stations.

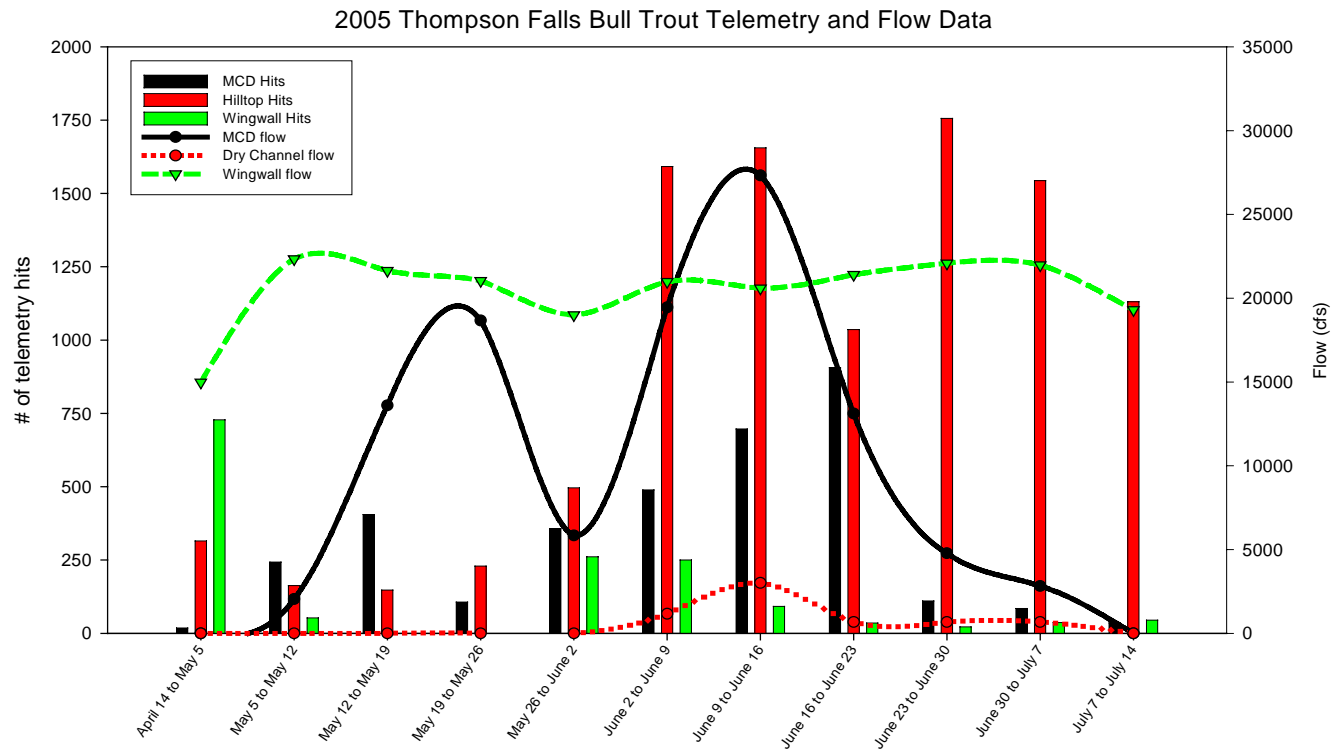


Figure 15. Number of telemetry hits for bull trout detected in 2005 at the three remote stations at Thompson Falls Dam and the vicinity where flow was occurring in the project area.

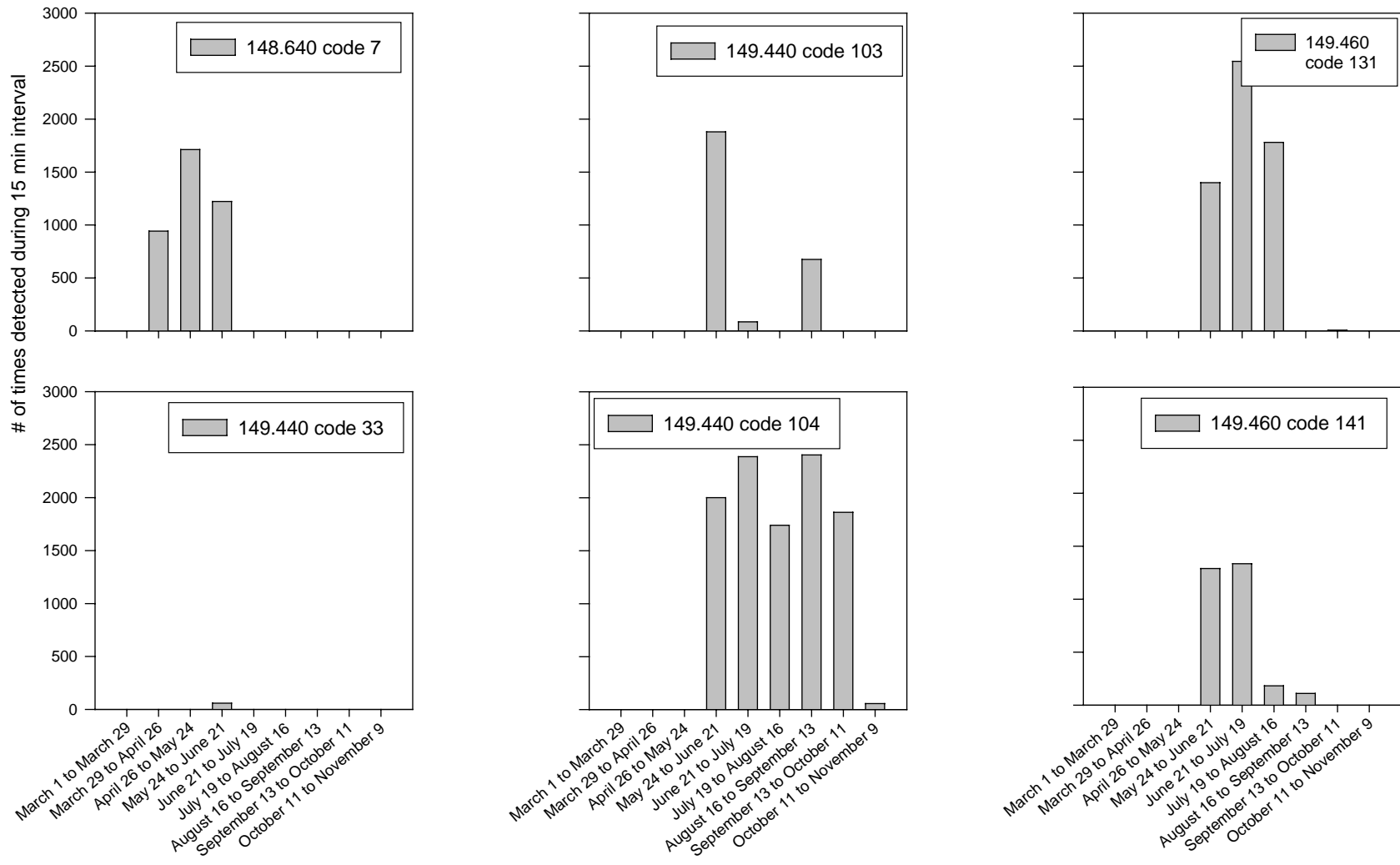


Figure 16. Dates Individual Bull Trout Were Recorded at the Thompson Falls Project by Month, 2005

Bull Trout 148.640 code 7

Captured: 4/19/04
Method: Night Shocking
Location: Near PPL Dam.
Release Date: 4/19/04

Release Location: Mouth of Squaw Creek **Total**
Length: 525 mm
Weight: 1275 g

2005 History BLT 148.640 Code 7

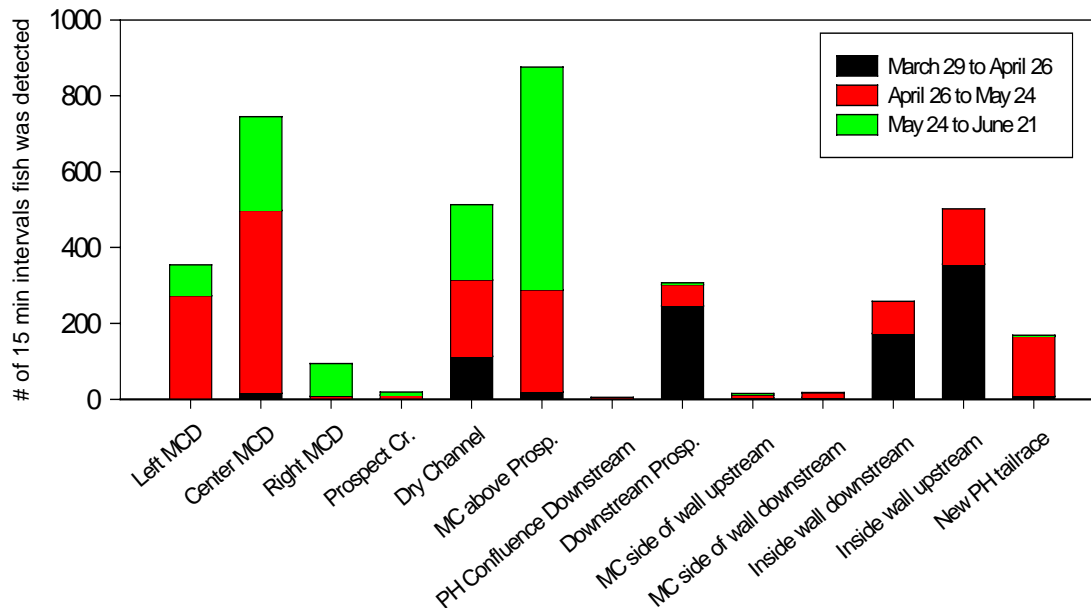


Figure 17. 2005 history bull trout 148.640 code 7.

Bull trout 148.640 code 7 was released near the mouth of Squaw Creek on April 19, 2004. This was the only bull trout detected at the project area in 2005 that was radio tagged during 2004. This fish was detected in the project area by the remote telemetry receivers between March 29 and April 26, 2005 (Figure 15). It made its way to the main channel dam where it was detected for the majority of the time at the center and left side of the dam.

Bull Trout 149.440 code 103

Captured: 5/22/05
Method: Electrofishing
Location: LCFR
Release Date: 5/25/05

Release Location: Vermillion River near mouth
Total Length: 777 mm
Weight: 4792 g
PIT Tag: 98512001802301

Genetics: Fishtrap Cr (Region 4) / East Fork Bull River (Region 2) / Confidence = 283.8

2005 History
BLT 149.440 Code 103

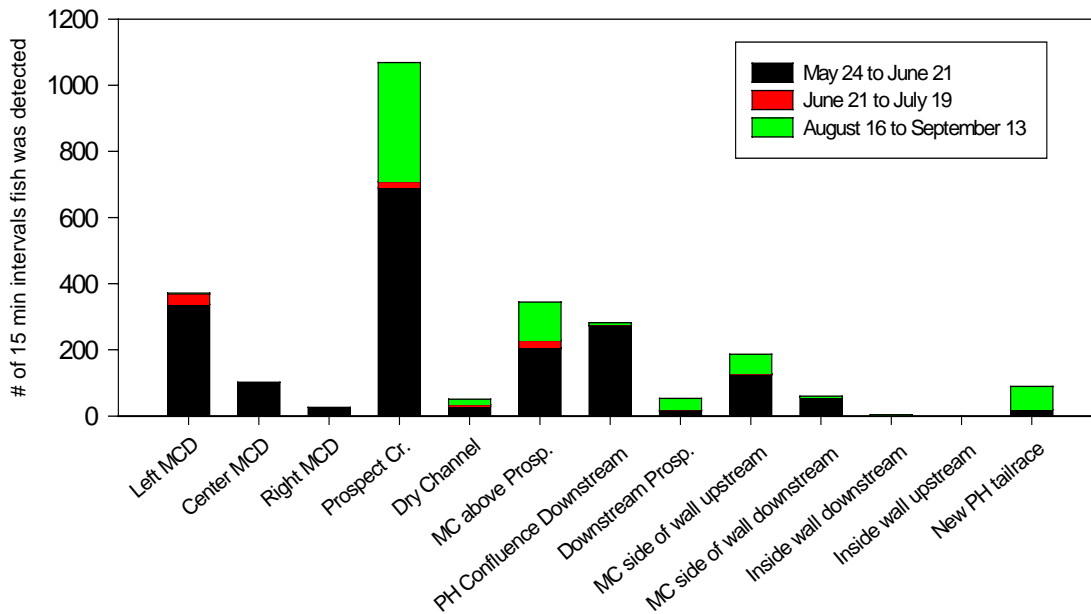


Figure 18. 2005 history bull trout 149.440 code 103.

Bull Trout 149.440 code 33

Captured: 5/22/05
Method: Electrofishing
Location: LCFR 100 yards below warehouse
Release Date: 5/25/05

Release Location: Vermillion River near mouth
Total Length: 615 mm
Weight: 2127 g
PIT Tag: 985120011368292

Genetics: 2004 baseline = Swamp Cr (Region 3) / Rock Cr (Region 2) / Confidence = 1,000,000 and 2005 baseline = Granite Cr (Region 1) / Graves Cr (Region 3) / Confidence = 936.7

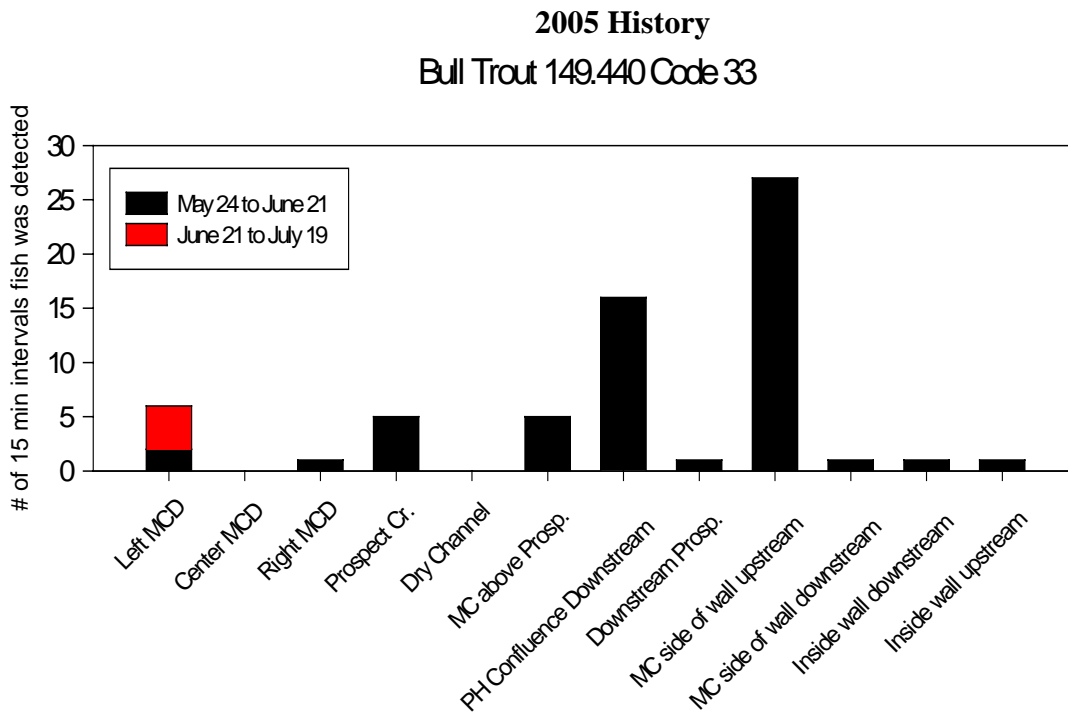


Figure 19. 2005 history bull trout 149.440 code 33.

Bull Trout 149.440 code 104

Captured: 4/26/05
Method: Electrofishing
Location: LCFR across from warehouse
Release Date: 4/29/05

Release Location: Vermillion River Bay
Total Length: 550 mm
Weight: 1588 g
PIT Tag: 985120018011148

Genetics: Fishtrap Cr (Region 4) / Grouse Cr (Region 1) / Confidence = 2,390

2005 History BLT 149.440 Code 104

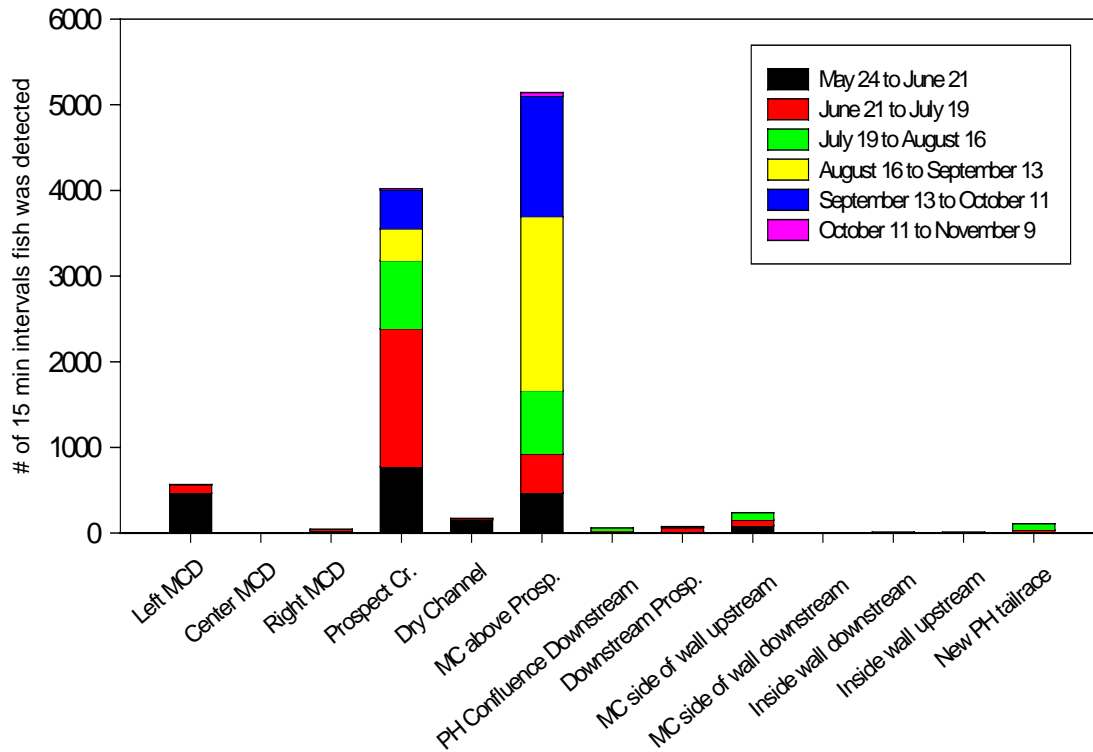


Figure 20. 2005 history bull trout 149.440 code 104.

Bull Trout 149.460 code 131

Captured: 5/22/05
Method: Electrofishing
Location: LCFR USGS Cable
Release Date: 5/25/05

Release Location: Vermillion River near mouth
Total Length: 765 mm
Weight: 4508 g
PIT Tag: 985120020943873

Genetics: Fishtrap Cr (Region 4) / Twin Cr (Region 1) / Confidence = 17,000

2005 History
BLT 149.460 Code 131

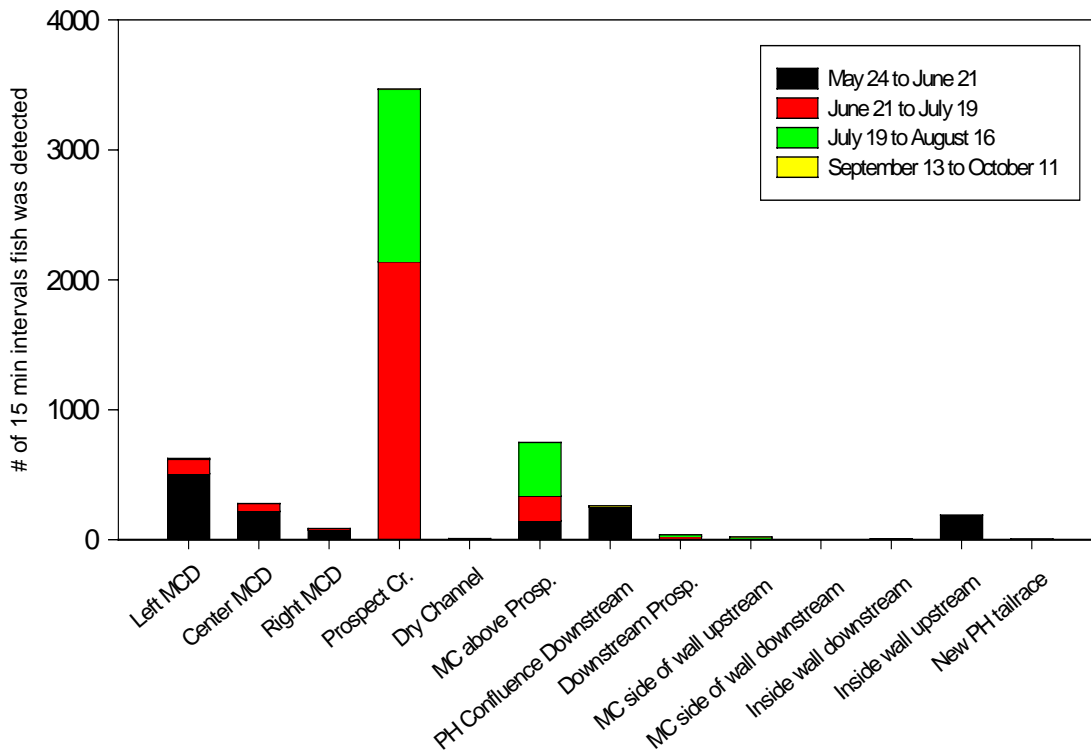


Figure 21. 2005 history bull trout 149.460 code 131.

Bull Trout 149.460 code 141

Captured: 5/24/05
Method: Electrofishing
Location: LCFR
Release Date: 5/27/05

Release Location: Vermillion River near mouth
Total Length: 795 mm
Weight: 3941 g
PIT Tag: 985120012210724

Genetics: Graves Cr (Region 3) / Rock Cr (Region2) / Confidence = 44.77

2005 History
 BLT 149.460 Code 141

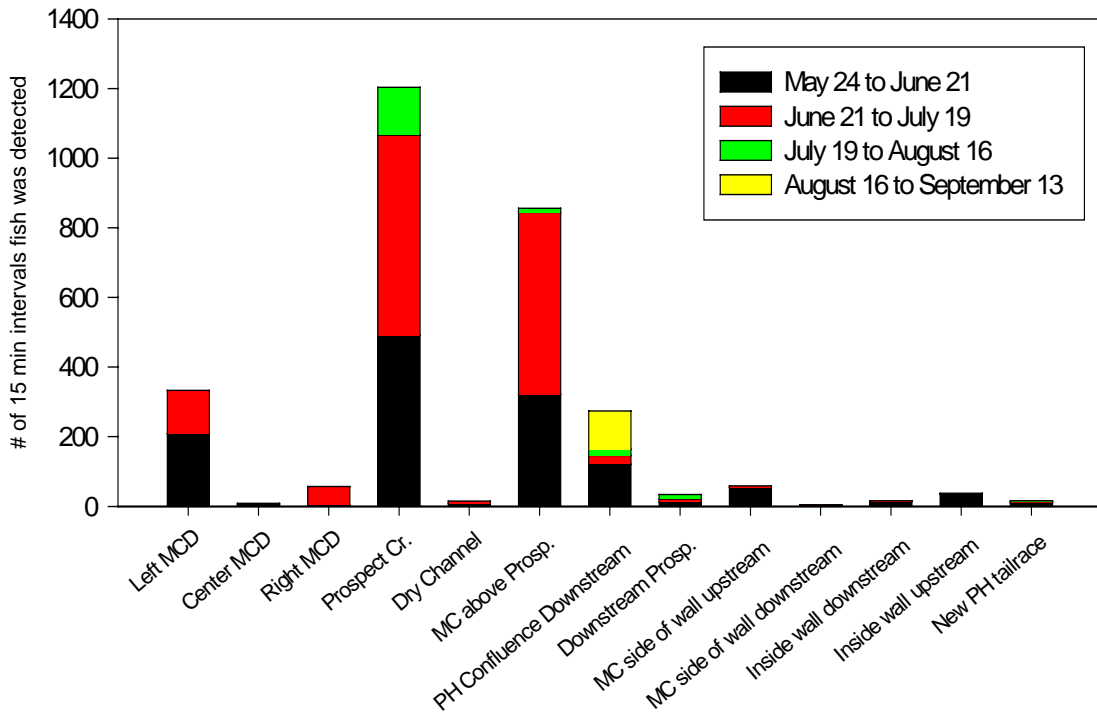


Figure 22. 2005 history bull trout 149.640 code 141.

All Avista tagged bull trout were detected at the Thompson Falls project area during the May 24 to June 21 period, which was just after their release into Noxon Reservoir. Each bull trout made foray to the main channel dam area, although each spent a relatively small proportion of their total time in the project area at the main channel dam (Figures 16 – 30). After the foray to the main channel dam, each Avista bull trout then dropped back into the hilltop area for the remaining of the time in the project area. No specific differences in behavior at the Thompson Falls project were observed for the various bull trout.

3.4 Westslope Cutthroat Trout

In contrast to bull trout, the timing when westslope cutthroat were present in the project area in 2005 was a narrow time frame in the spring, predominately from early May until late May (Figure 23). Only two cutthroat trout were detected after May 24, and only one fish was detected after June 21. None were detected after July 19 (Figures 24 and 25).

Westslope cutthroat trout seemed to be spurred by the beginning of spill in their movements to the main channel dam area (Figure 23). Very few westslope cutthroat trout hits were recorded before spill began. Once spill occurred, the majority of hits occurred at the main channel dam area until around May 26, when the total hits for this species decreased in the entire project area. Later in the season no westslope cutthroat trout were observed in the main channel dam area and the one that did remain in the project area spent most of its time being detected by the hilltop station.

2005 Thompson Falls Westslope Cutthroat Trout Telemetry and Flow Data

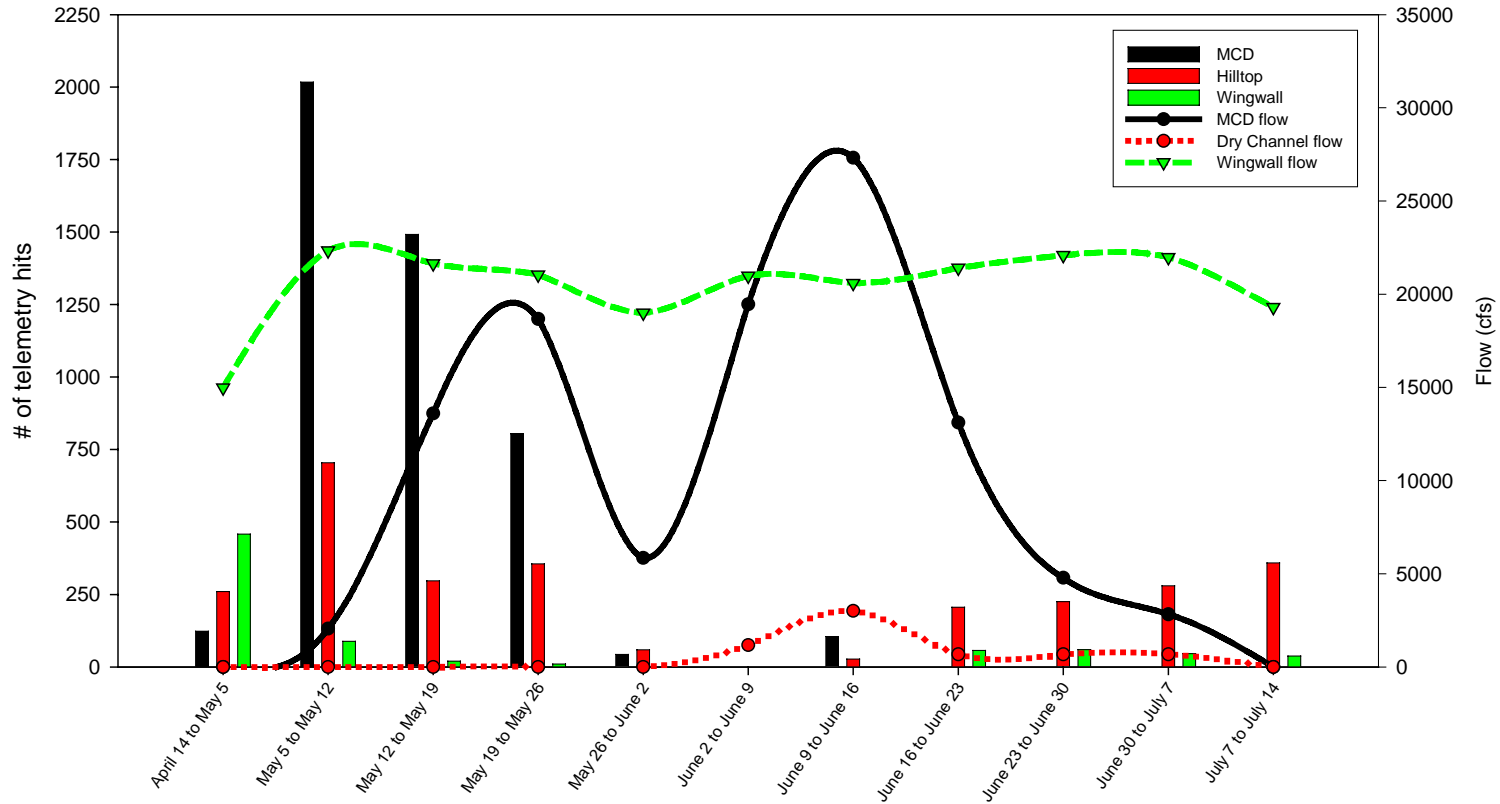


Figure 23. Number of telemetry hits for westslope cutthroat trout detected in 2005 at the three remote stations at Thompson Falls Dam and the vicinity where flow was occurring in the project area.

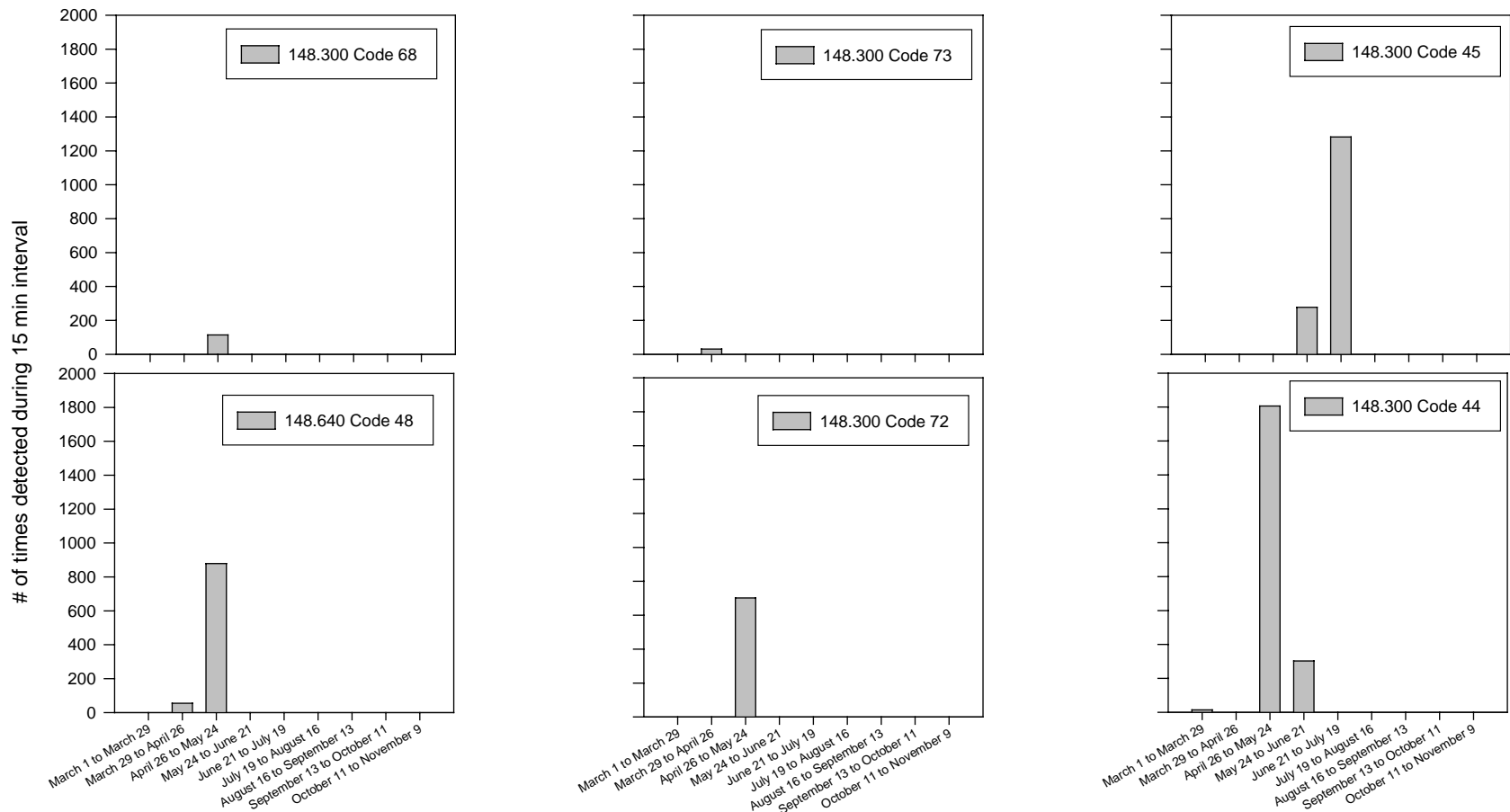


Figure 24. Dates Individual Westslope Cutthroat Trout Were Recorded at the Thompson Falls Project by Month, 2005. Page 1.

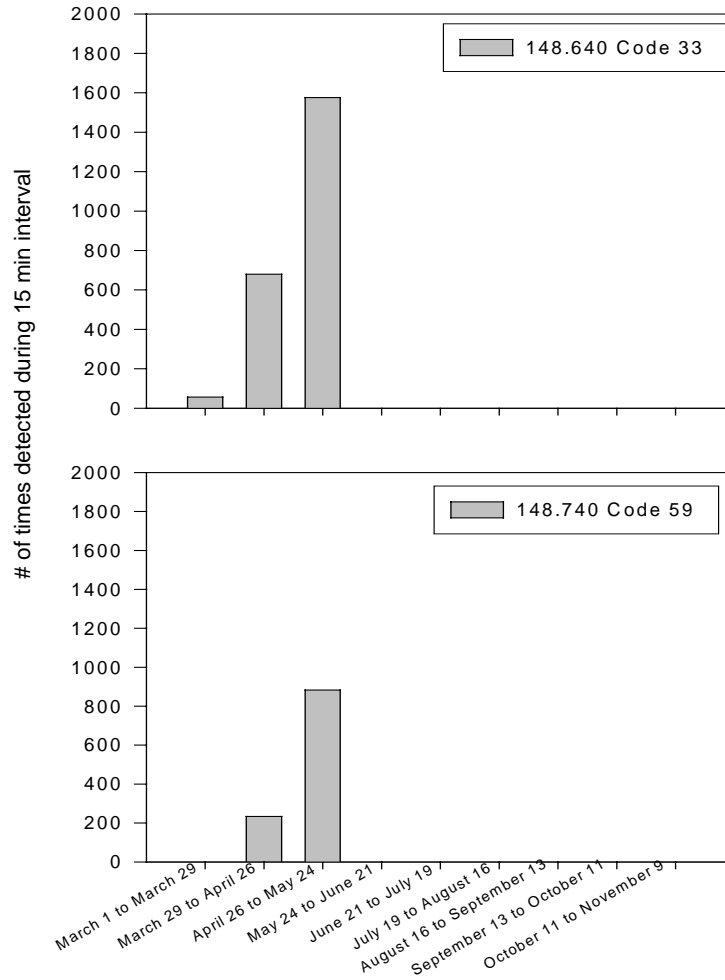


Figure 25. Dates Individual Westslope Cutthroat Trout Were Recorded at the Thompson Falls Project by Month, 2005. Page 2.

Captured: 4/27/05
Method: Trap
Location: Trap
Release Date: 4/27/05

Release Location: Squaw Creek
Total Length: 384 mm
Weight: 519 g
PIT Tag: 985120019758878

Westslope Cutthroat Trout 148.300 Code 44

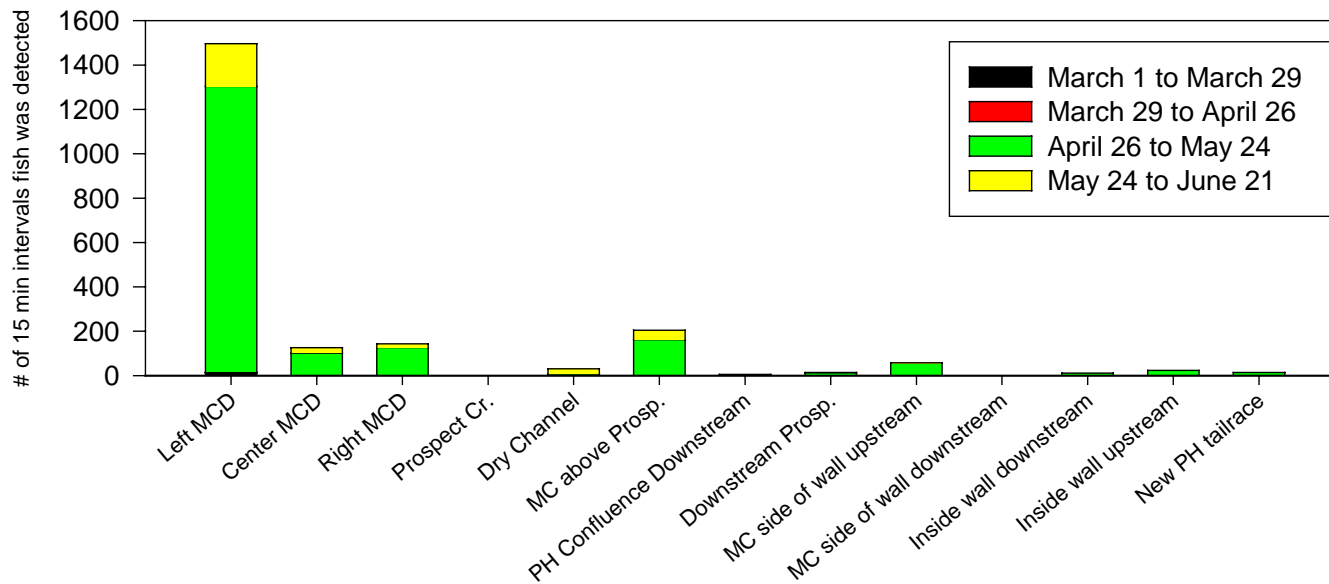


Figure 26. 2005 History for westslope cutthroat trout 148.300 code 44.

Captured: 5/5/05
Method: Trap
Location: Trap
Release Date: 5/5/05

Release Location: Squaw Creek
Total Length: 373 mm
Weight: 446 g
PIT Tag: 985120019769888

Westslope Cutthroat Trout 148.300 Code 68

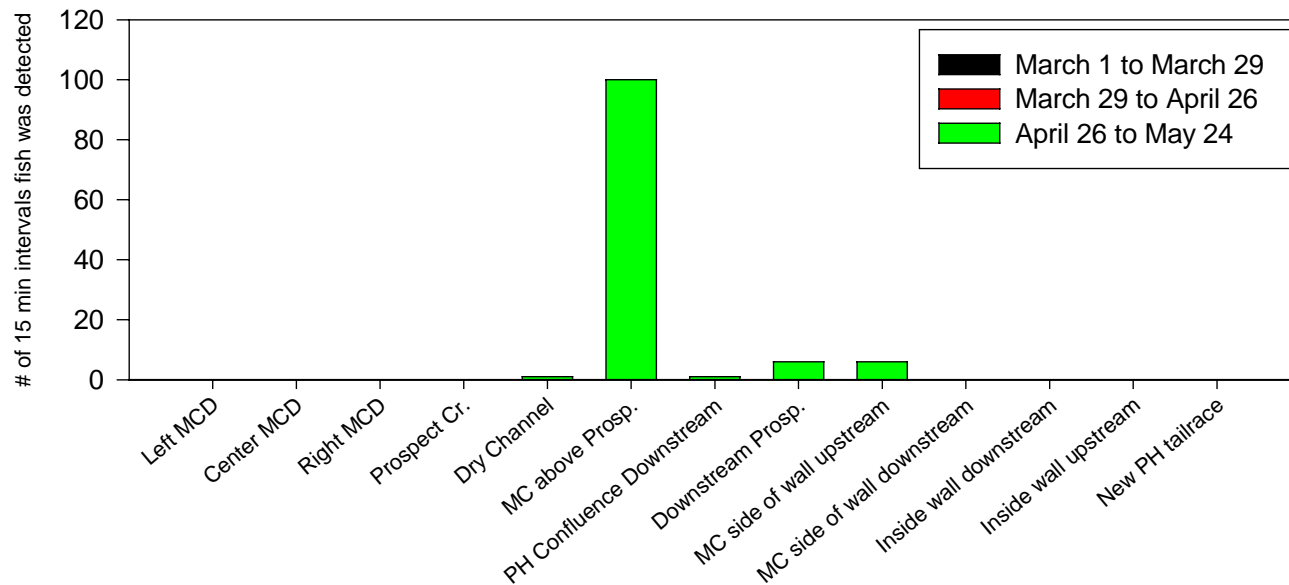


Figure 27. 2005 History for westslope cutthroat trout 148.300 code 68.

Captured: 4/22/05
Method: Trap
Location: Trap
Release Date: 4/22/05

Release Location: Squaw Creek
Total Length: 406 mm
Weight: 735 g
PIT Tag: 985120019719126

Westslope Cutthroat Trout 148.300 Code 73

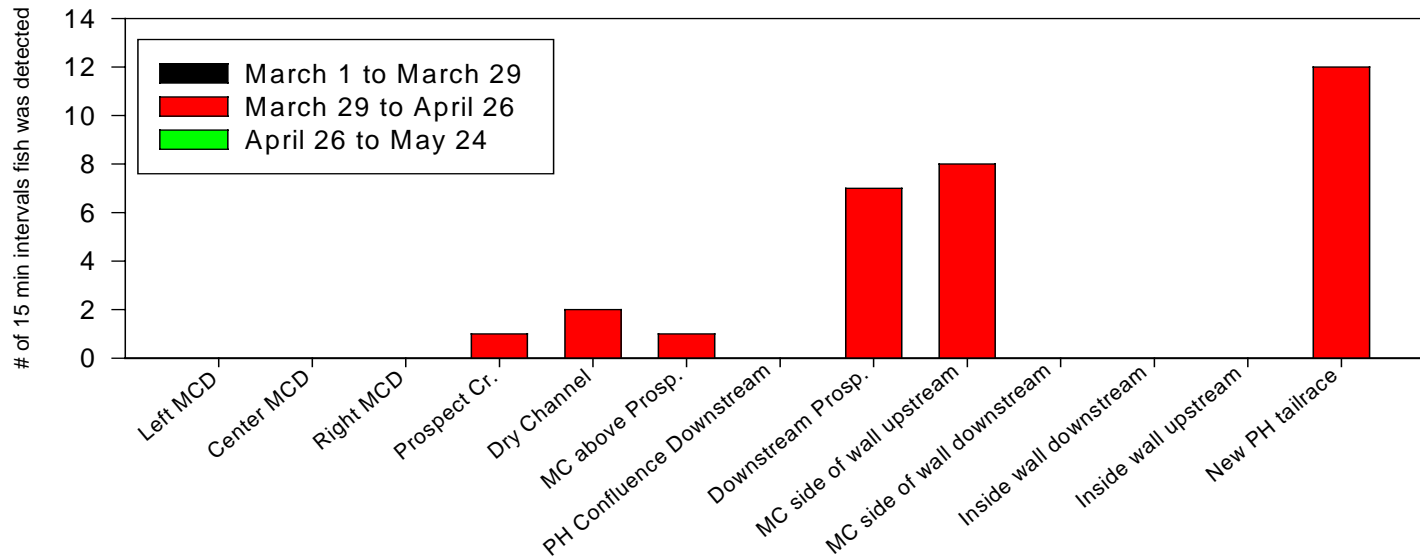


Figure 28. 2005 History for westslope cutthroat trout 148.300 code 73.

Captured: 4/12/05
Method: Electrofishing
Location: Thompson Falls Dam Area
Release Date: 4/12/05

Release Location: Flat Iron Boat Launch
Total Length: 404 mm
Weight: 652 g
PIT Tag: 4528336F33

Westslope Cutthroat Trout 148.640 Code 48

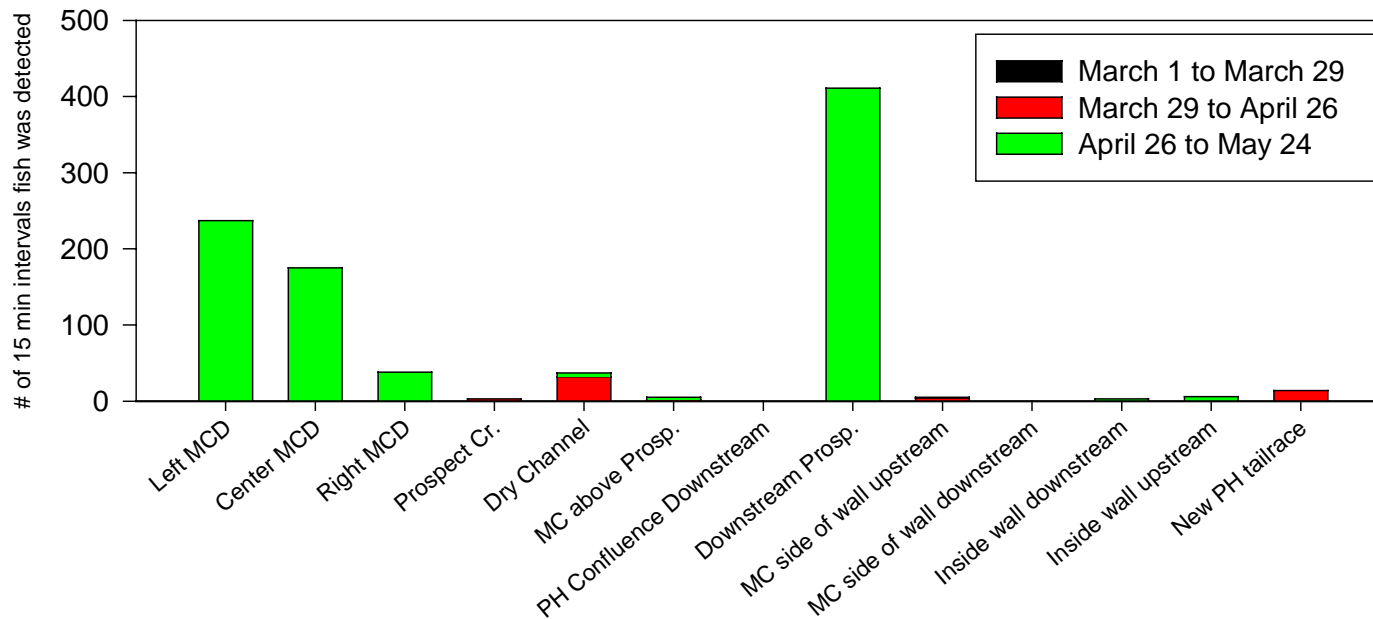


Figure 29. 2005 History for westslope cutthroat trout 148.640 code 48.

Captured: 5/3/05
Method: Trap
Location: Trap
Release Date: 5/3/05

Release Location: Squaw Creek
Total Length: 386 mm
Weight: 582 g
PIT Tag: 4669340C75

Westslope Cutthroat Trout 148.300 Code 45

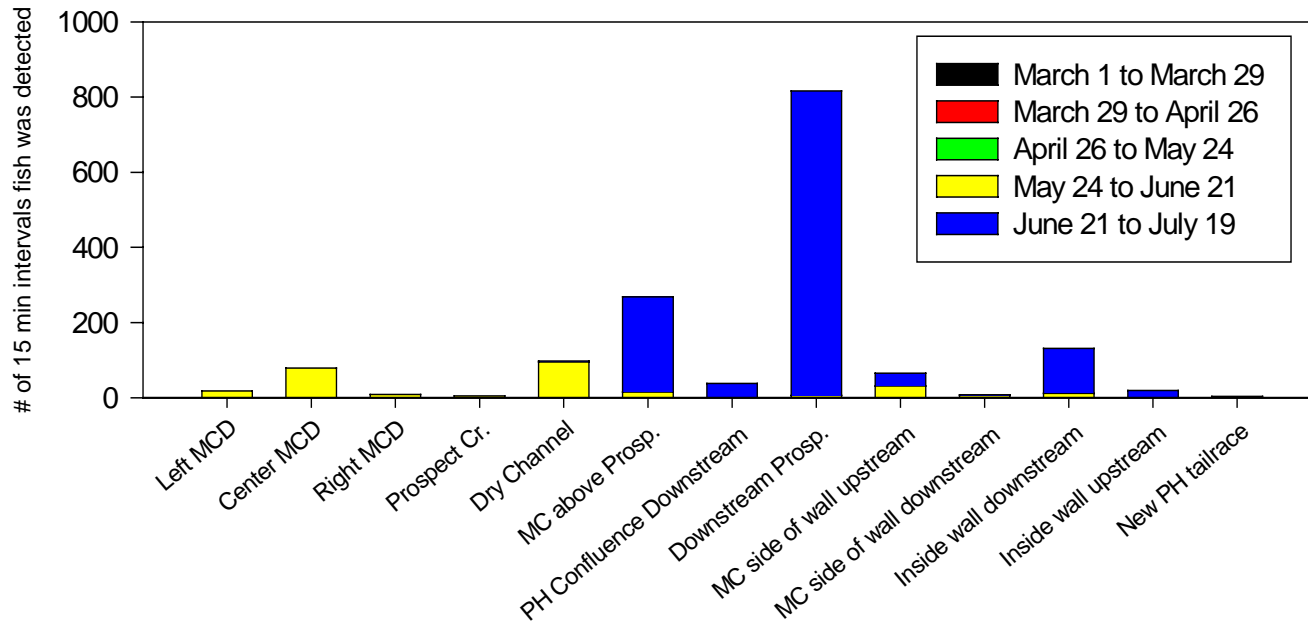


Figure 30. 2005 History for westslope cutthroat trout 148.300 code 45.

Captured: 4/26/05
Method: Trap
Location: Trap
Release Date: 4/26/05

Release Location: Squaw Creek
Total Length: 424 mm
Weight: 709 g
PIT Tag: 985120019700978

Westslope Cutthroat Trout 148.300 Code 72

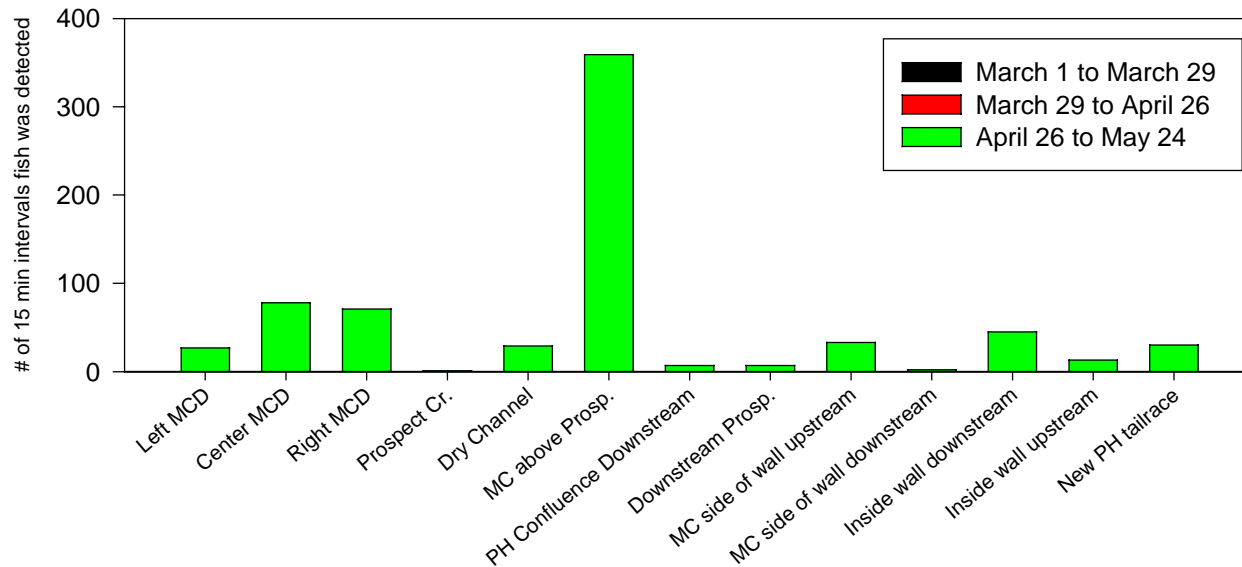


Figure 31. 2005 History for westslope cutthroat trout 148.300 code 72..

Captured: 3/30/05
Method: Trap
Location: Trap
Release Date: 3/30/05

Release Location: Squaw Creek
Total Length: 371 mm
Weight: 575 g
PIT Tag: 4225645D08

Westslope Cutthroat Trout 148.640 Code 33

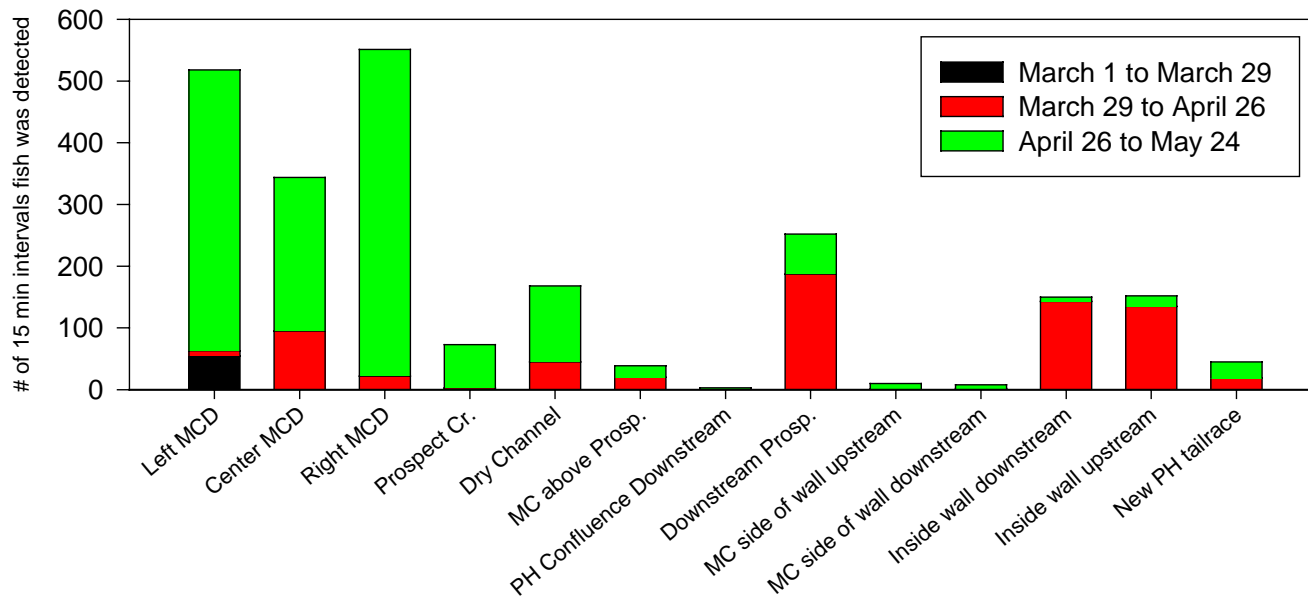


Figure 32. 2005 History for westslope cutthroat trout 148.640 code 33.

Captured: 4/11/05
Method: Electrofishing
Location: Thompson Falls Dam Area
Release Date: 4/11/05

Release Location: Flat Iron Boat Launch
Total Length: 424 mm
Weight: 750 g
PIT Tag: 432B06094

Westslope Cutthroat Trout 148.740 Code 59

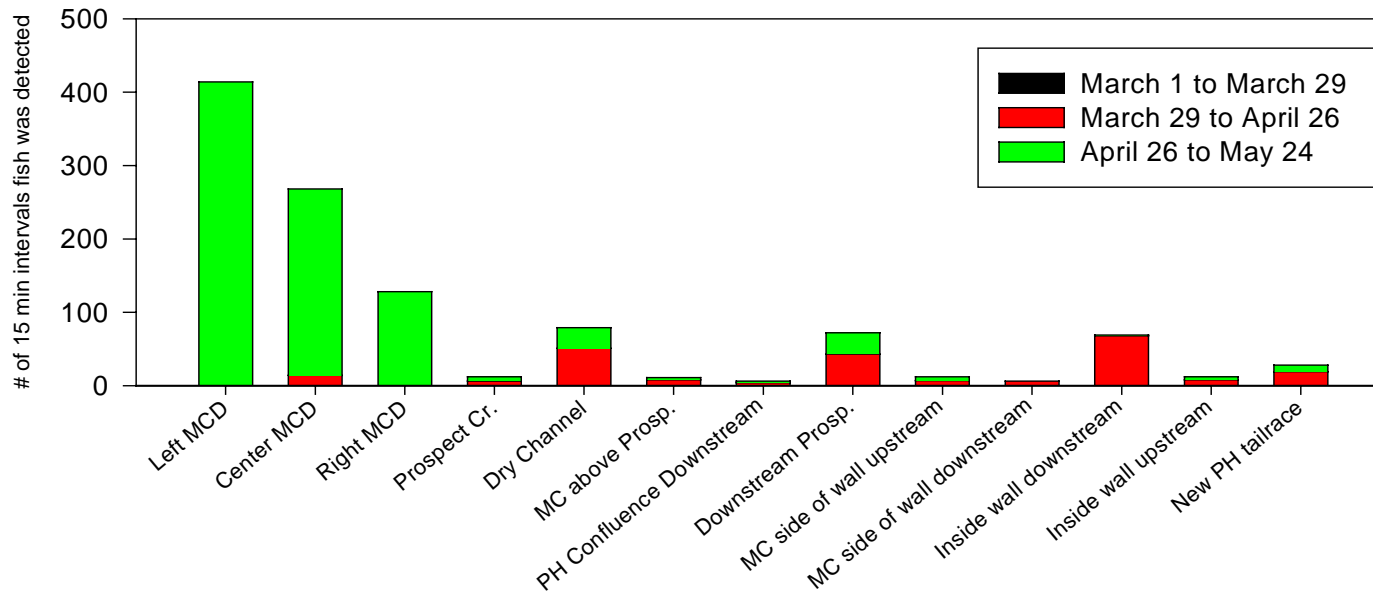


Figure 33. 2005 History for westslope cutthroat trout 148.740 code 59.

3.5 Rainbow Trout

The behavior of rainbow trout was different than the other species monitored during 2005. Radio tagged rainbow trout were abundant in the project area before spill, but once spill began their detections significantly decreased (Figure 34). Only one individual rainbow trout had a significant presence in the project area after May 24, and this fish was not detected after June 21 (Figures 35 – 38).

Before spill, a greater proportion of telemetry hits were detected at the hilltop station. Once spill began a shift occurred to the main channel dam station until May 19, by which time most rainbow trout had left the project area (Figure 34).

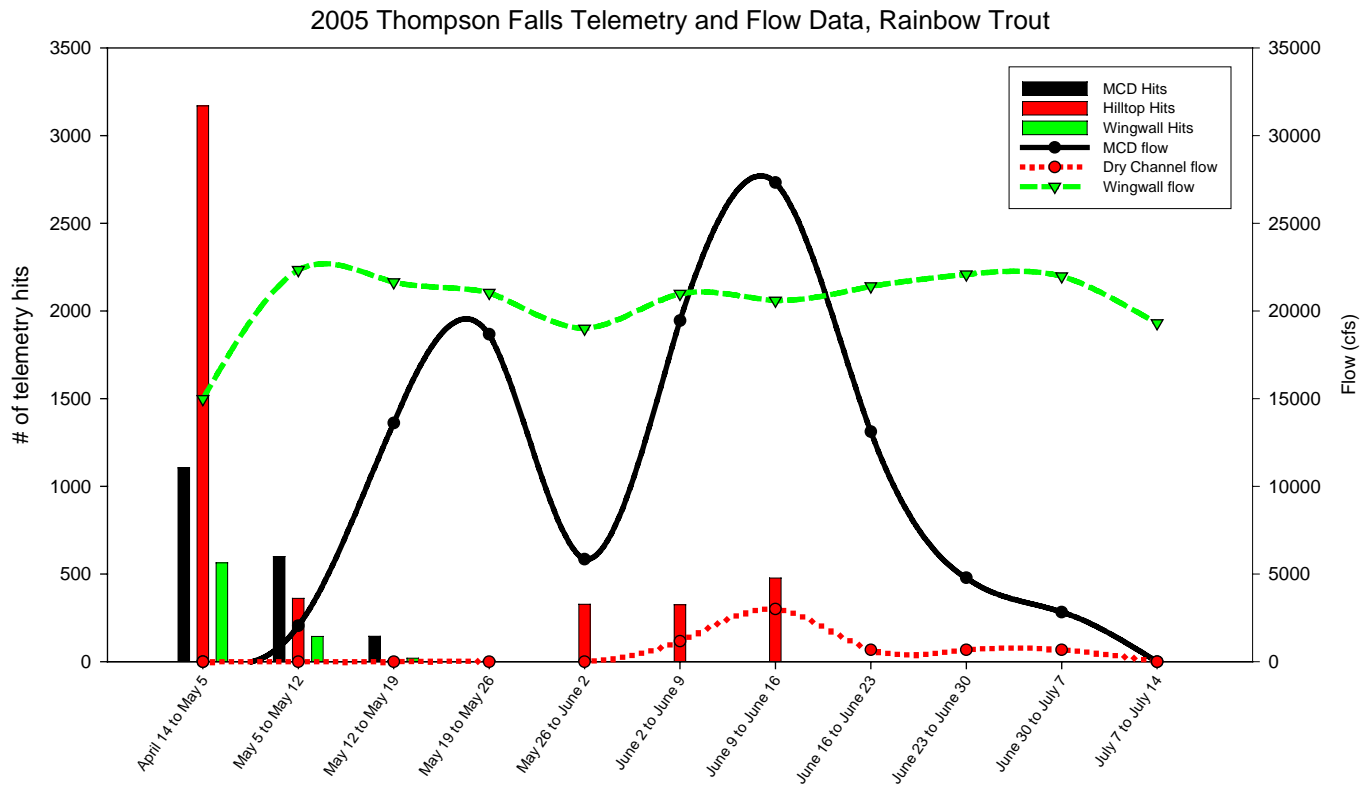


Figure 34. Number of telemetry hits for rainbow trout detected in 2005 at the three remote stations at Thompson Falls Dam and the vicinity where flow was occurring in the project area.

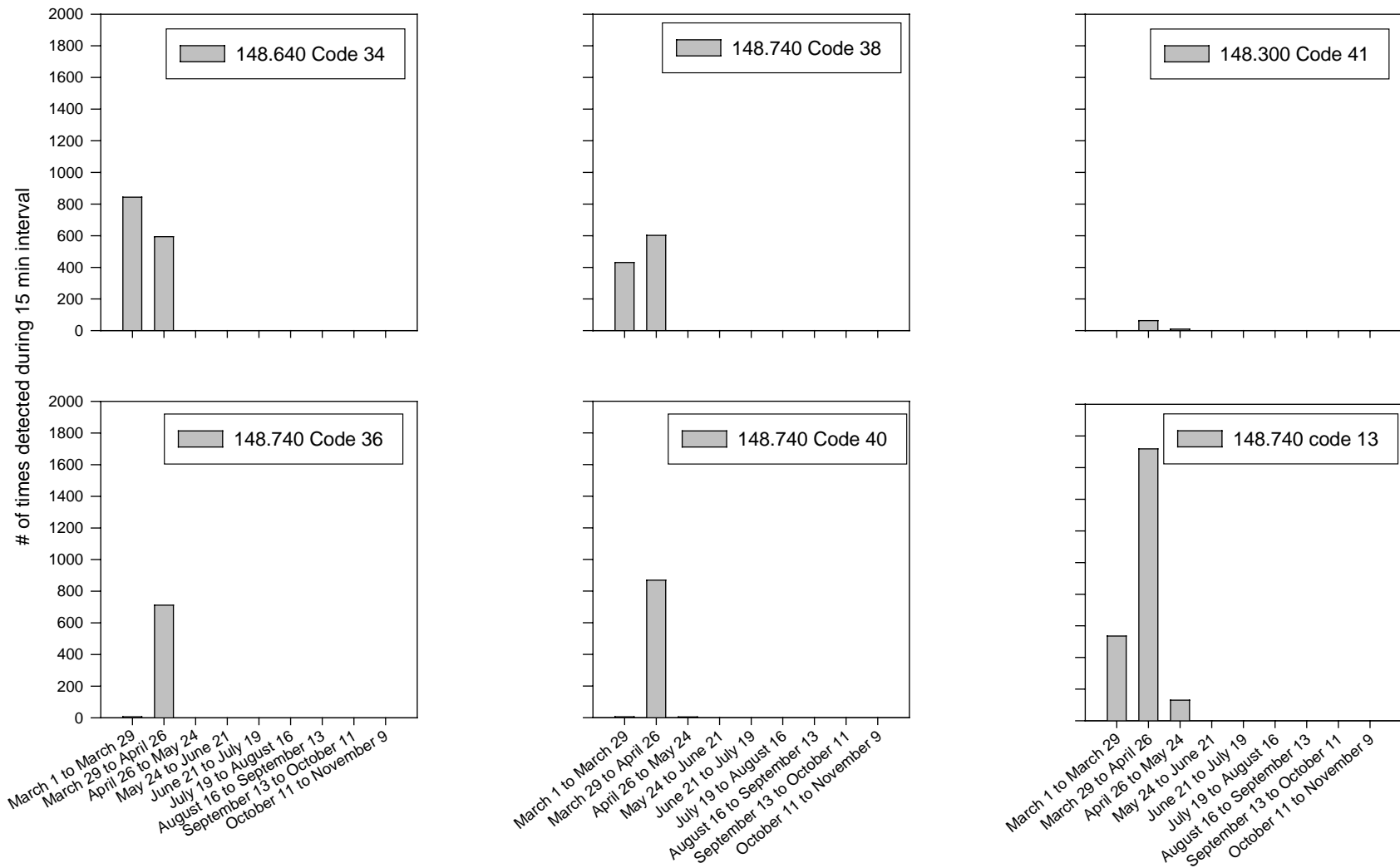


Figure 35. Dates Individual Rainbow Trout Were Recorded at the Thompson Falls Project by Month, 2005

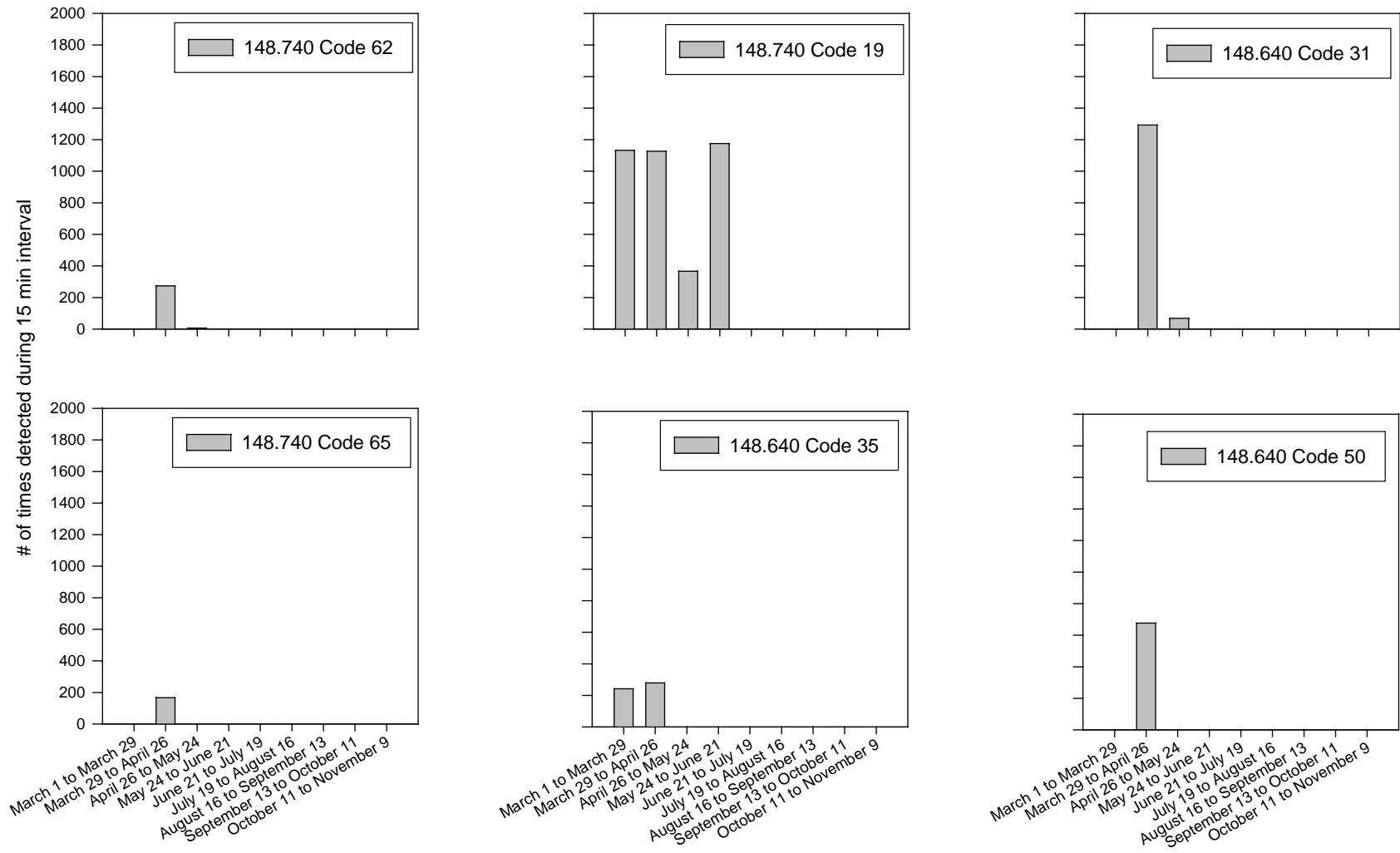


Figure 36. Dates Individual Rainbow Trout Were Recorded at the Thompson Falls Project by Month, 2005, continued

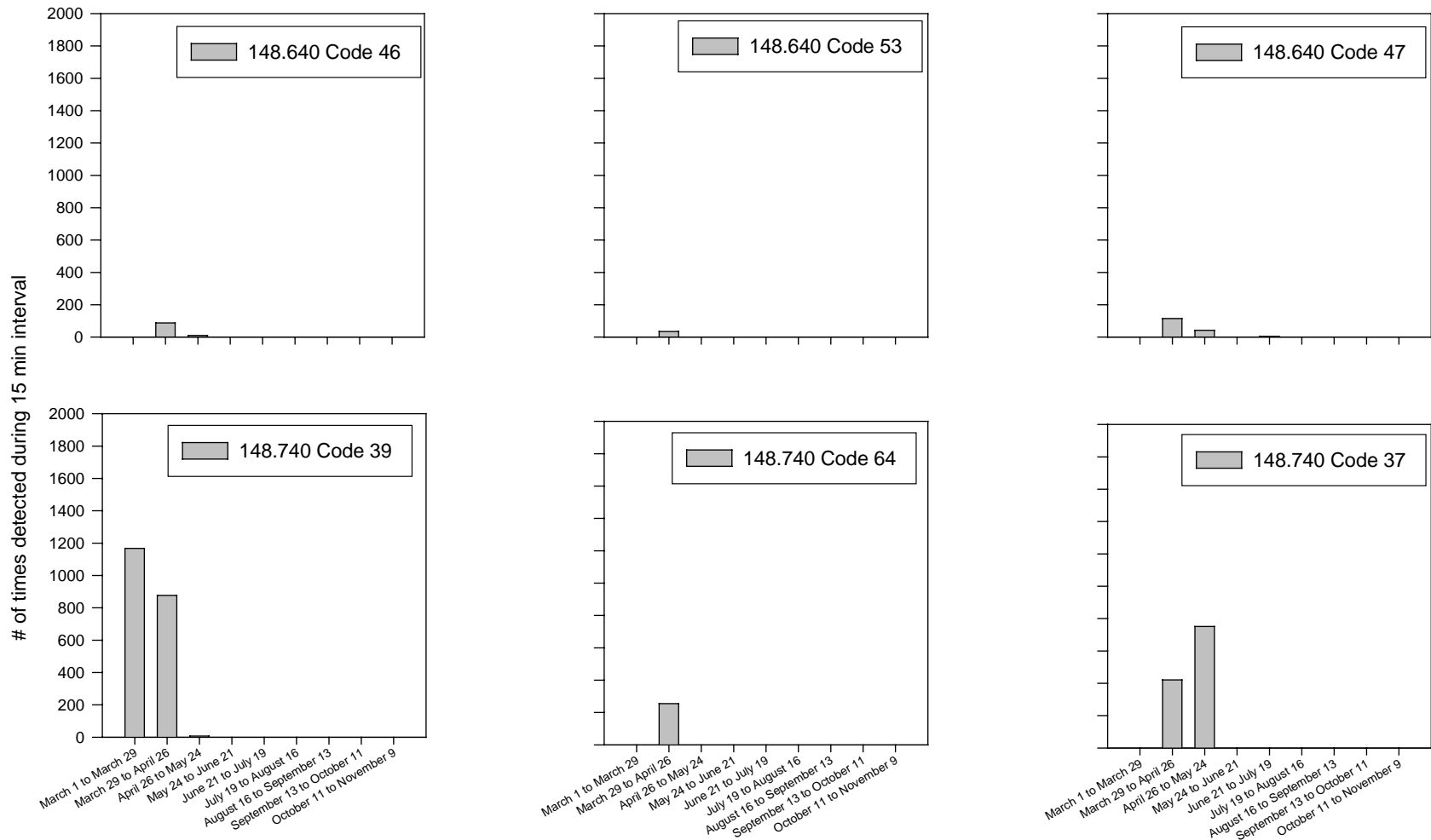


Figure 37. Dates Individual Rainbow Trout Were Recorded at the Thompson Falls Project by Month, 2005, continued

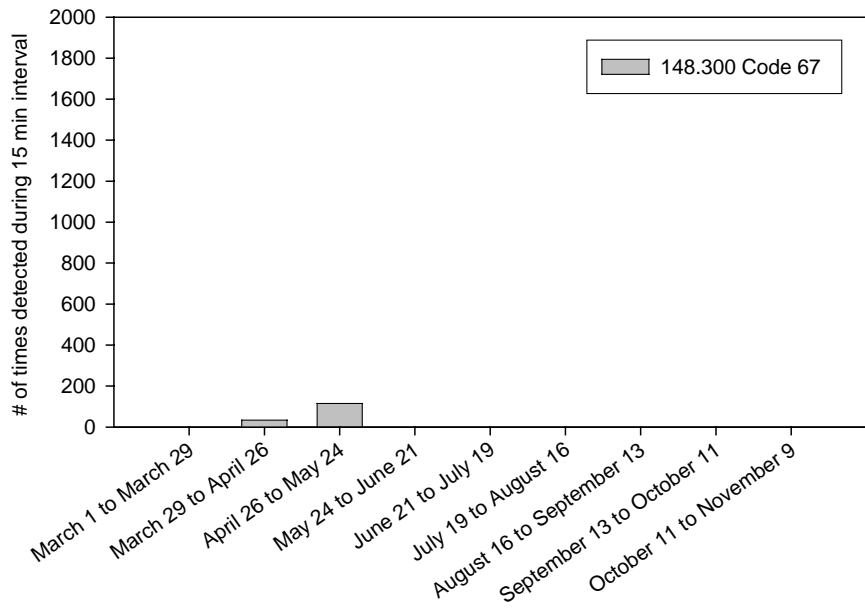


Figure 38 Dates Individual Rainbow Trout Were Recorded at the Thompson Falls Project by Month, 2005, continued

3.5.1 Individual fish histories for rainbow trout

Captured: 3/19/04

Method: Trap

Location: Trap

Release Date: 3/19/04

Release Location: Squaw Creek

Total Length: 543 mm

Weight: 1604 g

PIT Tag: 985120006340391

RBT 148.740 Code 13

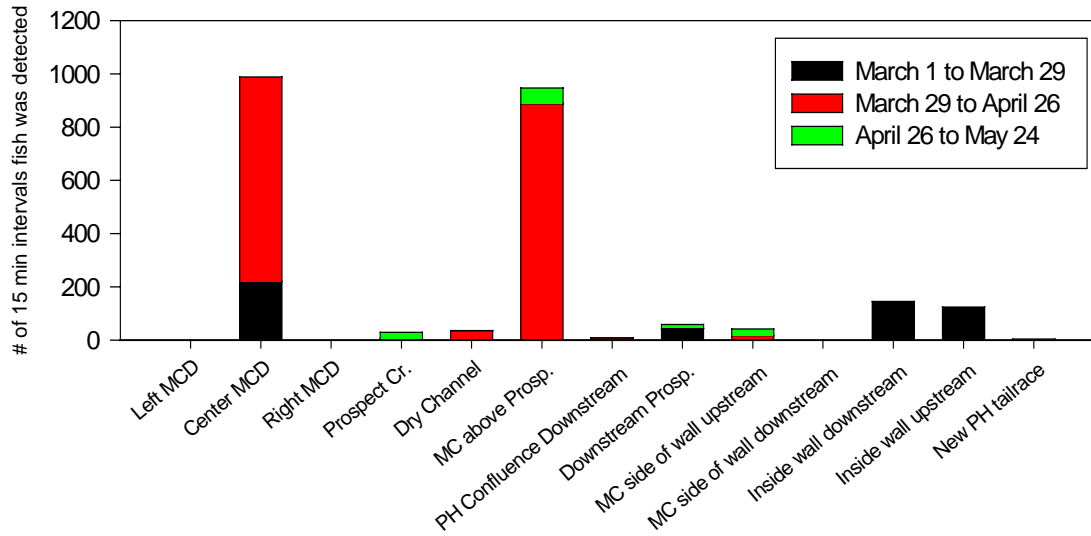


Figure 39. 2005 history for rainbow trout 148.740 code 13.

Captured: 4/23/04
Method: Trap
Location: Trap
Release Date: 4/23/04
Release Location: Squaw Creek

Total Length: 438 mm
Weight: 804 g
PIT Tag: 985120019762826

RBT 148.740 Code 19

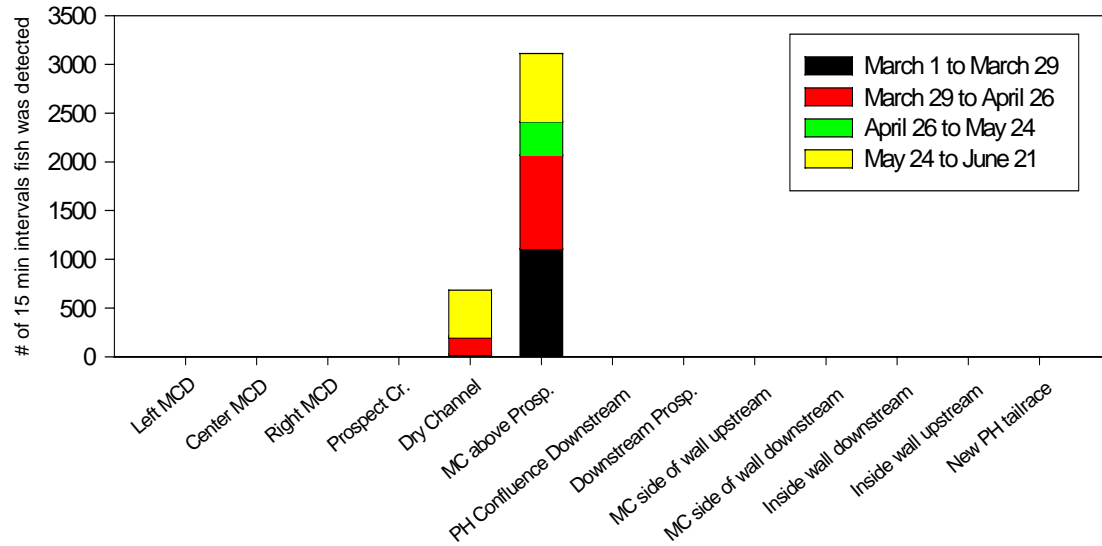


Figure 40. 2005 history for rainbow trout 148.740 code 19.

Captured: 10/13/04
Method: Angling
Location: Thompson Falls Dam Area
Release Date: 10/13/04

Release Location: Squaw Creek
Total Length: 452 mm
Weight: 763 g
PIT Tag: 985120019744624

RBT 148.740 Code 39

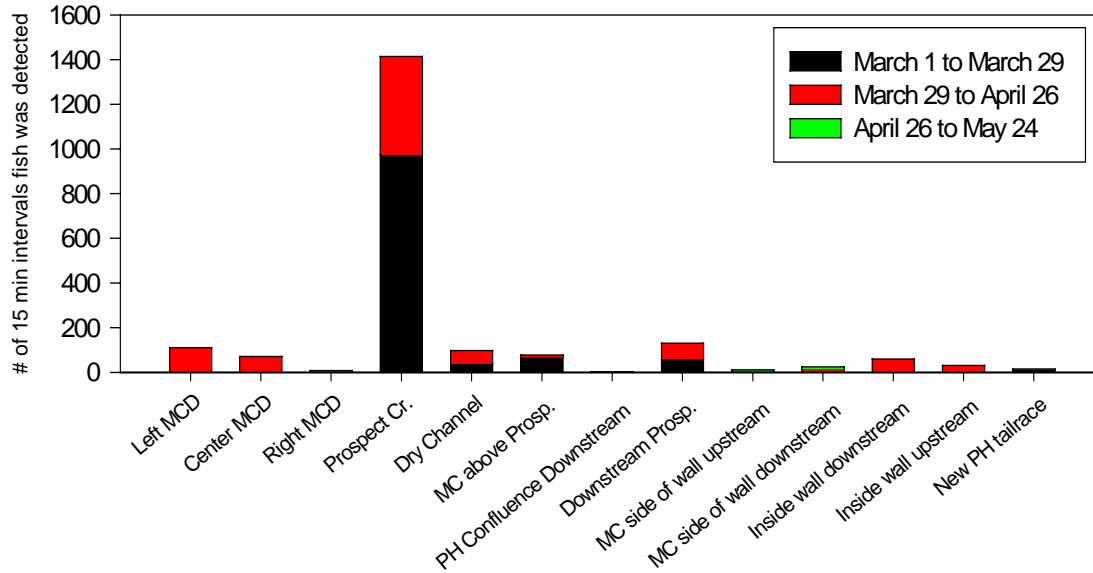


Figure 41. 2005 history for rainbow trout 148.740 code 39.

Captured: 10/13/04
Method: Angling
Location: Thompson Falls Dam Area
Release Date: 10/13/04

Release Location: Squaw Creek
Total Length: 443 mm
Weight: 863 g
PIT Tag: 985120019762501

RBT 148.640 Code 34

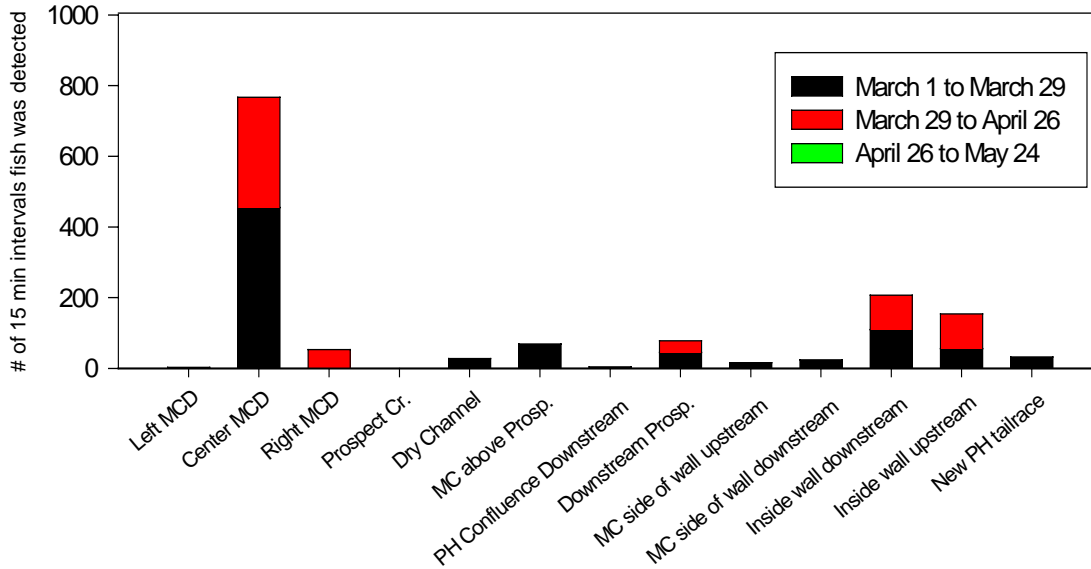


Figure 42. 2005 history for rainbow trout 148.640 code 34.

Captured: 4/20/05
Method: Trap
Location: Trap
Release Date: 4/20/05

Release Location: Squaw Creek
Total Length: 487 mm
Weight: 1102 g
PIT Tag: 985120019767331

RBT 148.300 Code 41

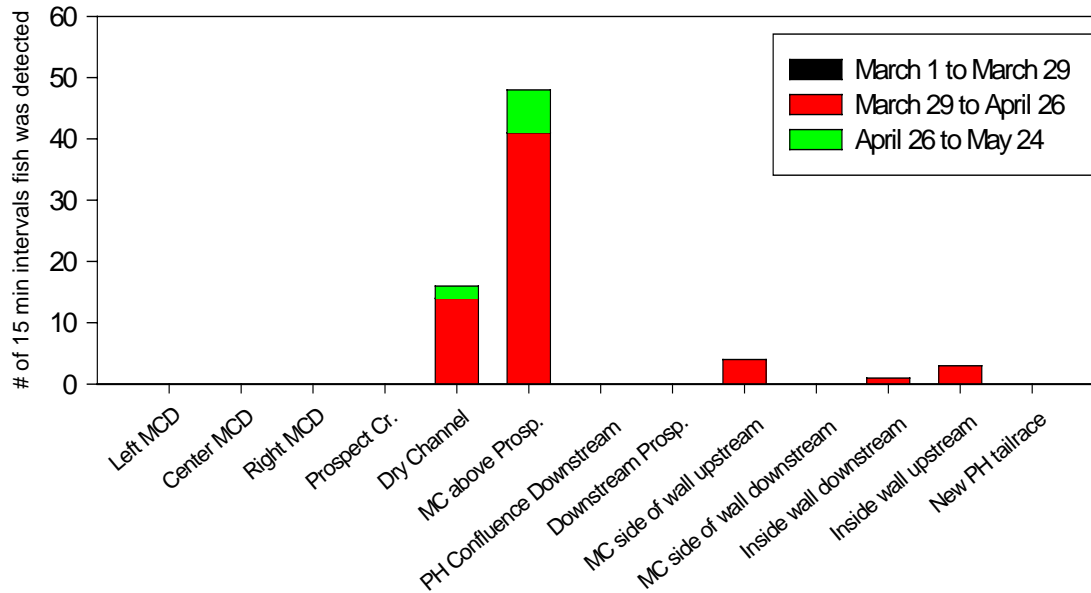


Figure 43. 2005 history for rainbow trout 148.300 code 41.

Captured: 3/30/05
Method: Trap
Location: Trap
Release Date: 3/30/05

Release Location: Squaw Creek
Total Length: 460 mm
Weight: 1025 g
PIT Tag: 422548E2D

RBT 148.640 Code 31

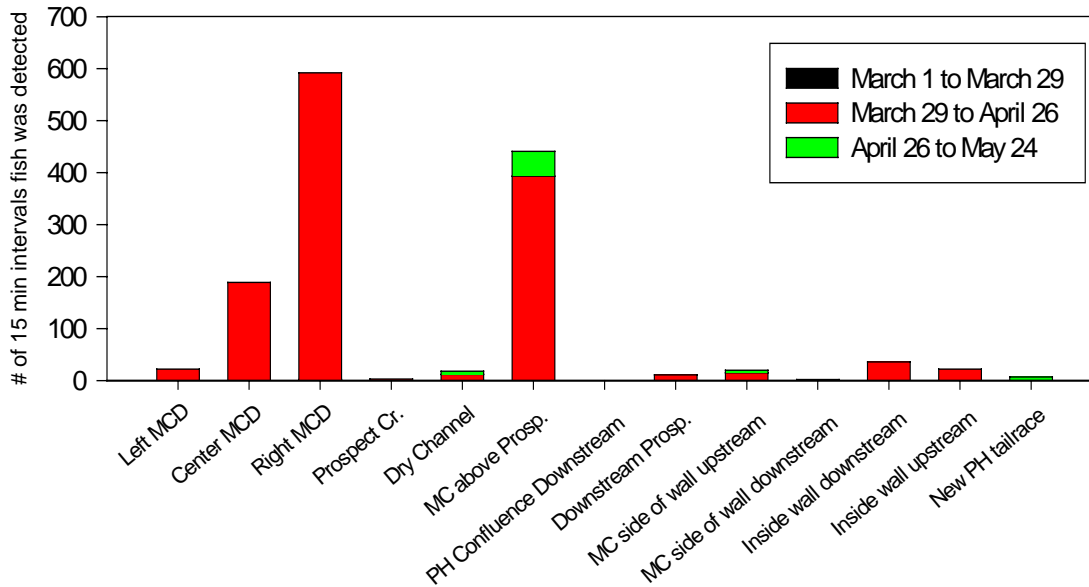


Figure 44. 2005 history for rainbow trout 148.640 code 31.

Captured: 3/18/05
Method: Trap
Location: Trap
Release Date: 3/18/05

Release Location: Squaw Creek
Total Length: 410 mm
Weight: 623 g
PIT Tag: 98512000768264

RBT 148.640 Code 35

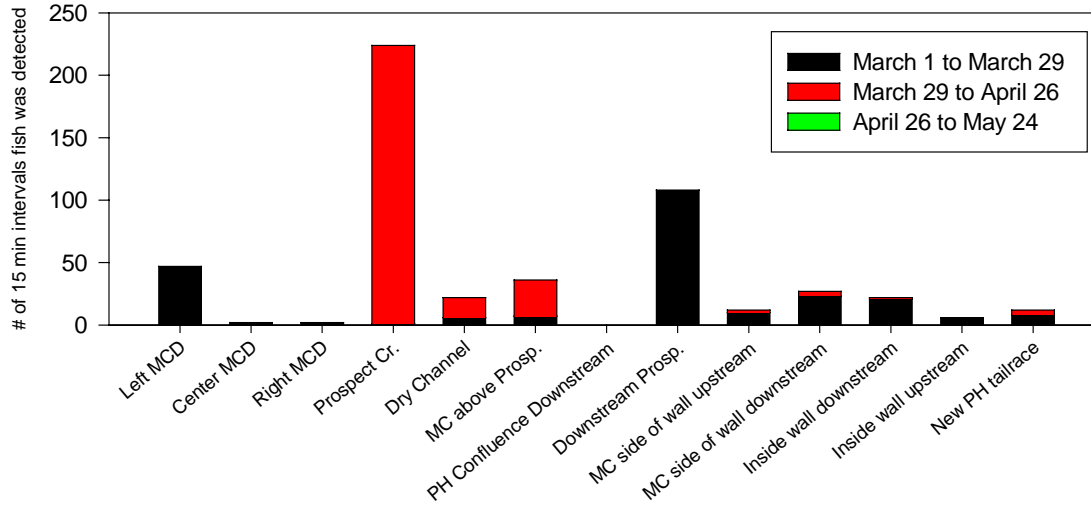


Figure 45. 2005 history for rainbow trout 148.640 code 35.

Captured: 4/18/05
Method: Trap
Location: Trap
Release Date: 4/18/05

Release Location: Squaw Creek
Total Length: 489 mm
Weight: 1031 g
PIT Tag: 4527076C16

RBT 148.640 Code 47

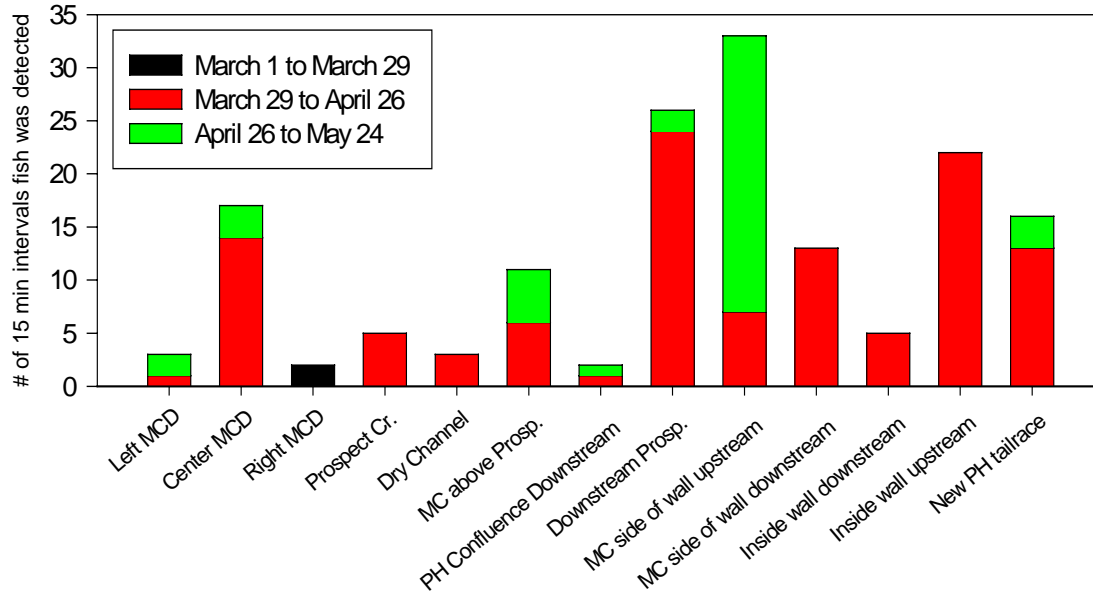


Figure 46. 2005 history for rainbow trout 148.640 code 47.

Captured: 4/18/05
Method: Trap
Location: Trap
Release Date: 4/18/05

Release Location: Squaw Creek
Total Length: 547 mm
Weight: 1390 g
PIT Tag: 4523141D72

RBT 148.640 Code 53

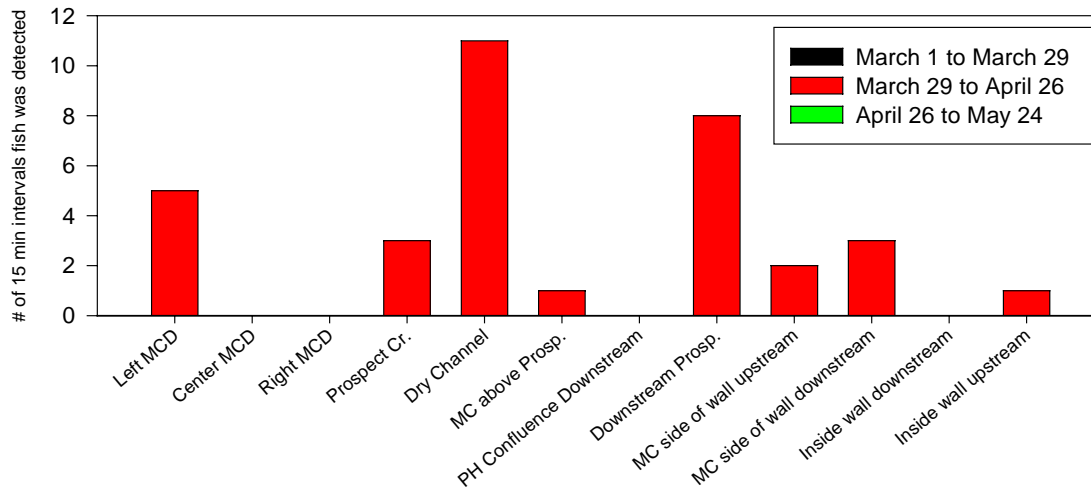


Figure 47. 2005 history for rainbow trout 148.640 code 53.

Captured: 4/1/05
Method: Trap
Location: Trap
Release Date: 4/1/05

Release Location: Squaw Creek
Total Length: 615 mm
Weight: 2127 g
PIT Tag 432D375479

RBT 148.740 Code 37

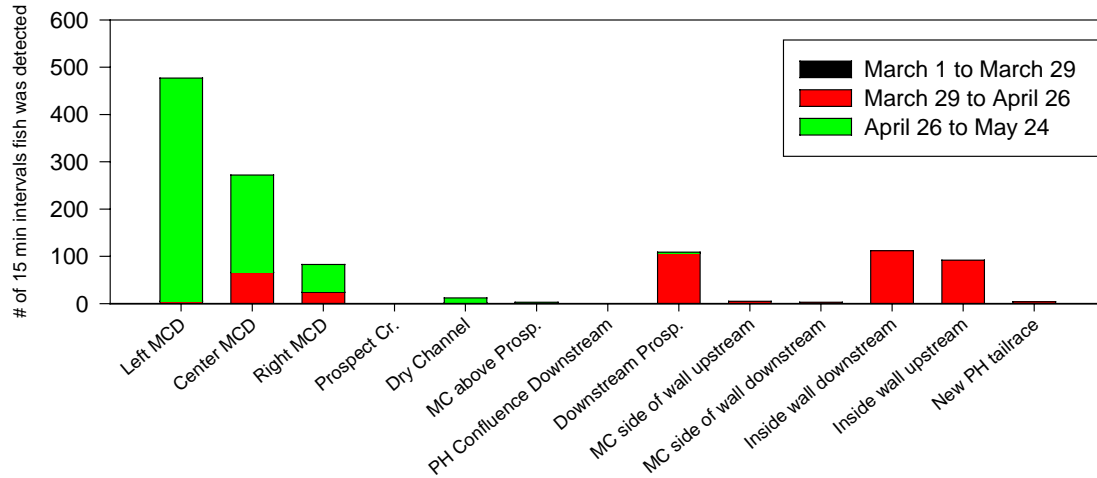


Figure 48. 2005 history for rainbow trout 148.740 code 37.

Captured: 4/11/05
Method: Electrofishing
Location: Thompson Falls Dam Area
Release Date: 4/11/05

Release Location: Squaw Creek
Total Length: 541 mm
Weight: 1230 g
PIT Tag: 985120019810616

RBT 148.740 Code 62

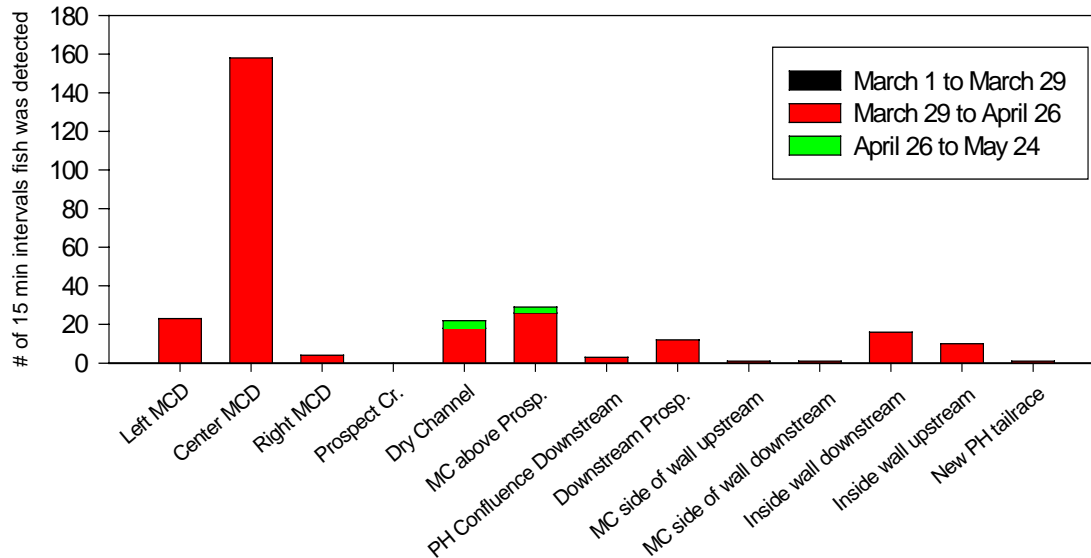


Figure 49. 2005 history for rainbow trout 148.740 code 62.

Captured: 4/5/05
Method: Trap
Location: Trap
Release Date: 4/5/05

Release Location: Squaw Creek
Total Length: 513 mm
Weight: 1176 g
PIT Tag: 432C1B5168

RBT 148.740 Code 65

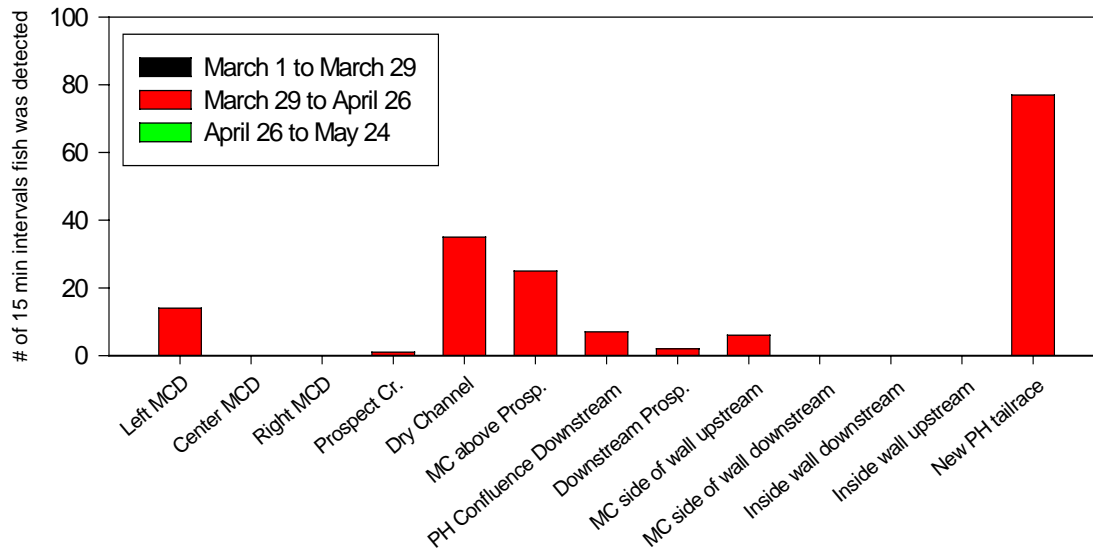


Figure 50. 2005 history for rainbow trout 148.740 code 65.

Captured: 4/21/05
Method: Electrofishing
Location: Thompson Falls Dam Area
Release Date: 4/21/05

Release Location: Flat Iron Boat Launch
Total Length: 465 mm
Weight: 945 g
PIT Tag: 985120019718471

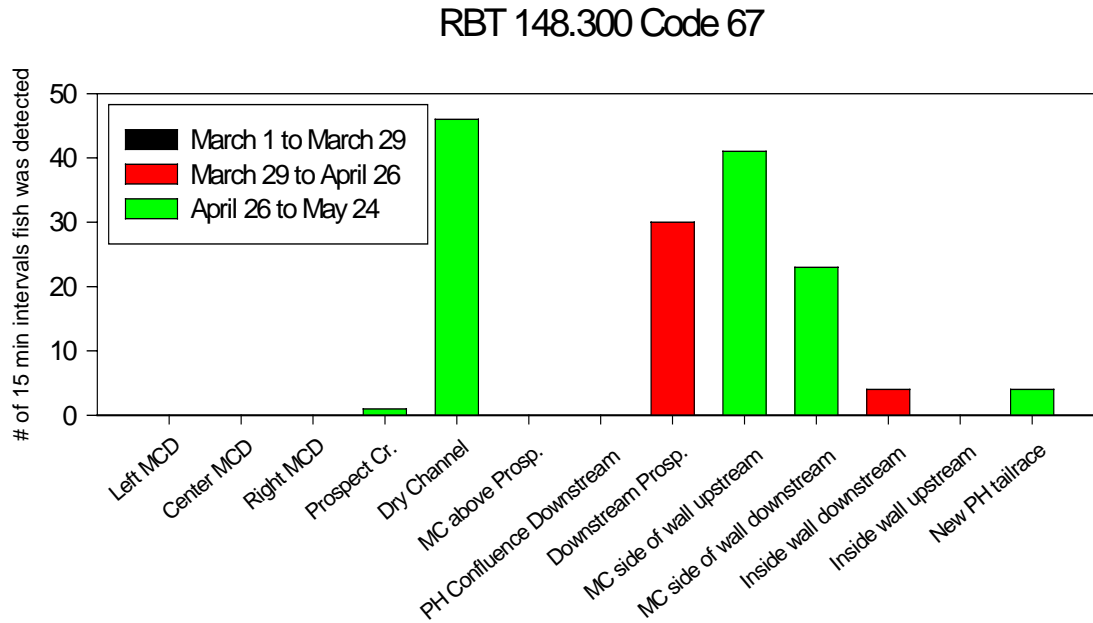


Figure 51. 2005 history for rainbow trout 148.300 code 67.

Captured: 4/18/05
Method: Trap
Location: Trap
Release Date: 4/18/05

Release Location: Squaw Creek
Total Length: 466 mm
Weight: 897 g
PIT Tag: 45274E1E04

RBT 148.640 Code 46

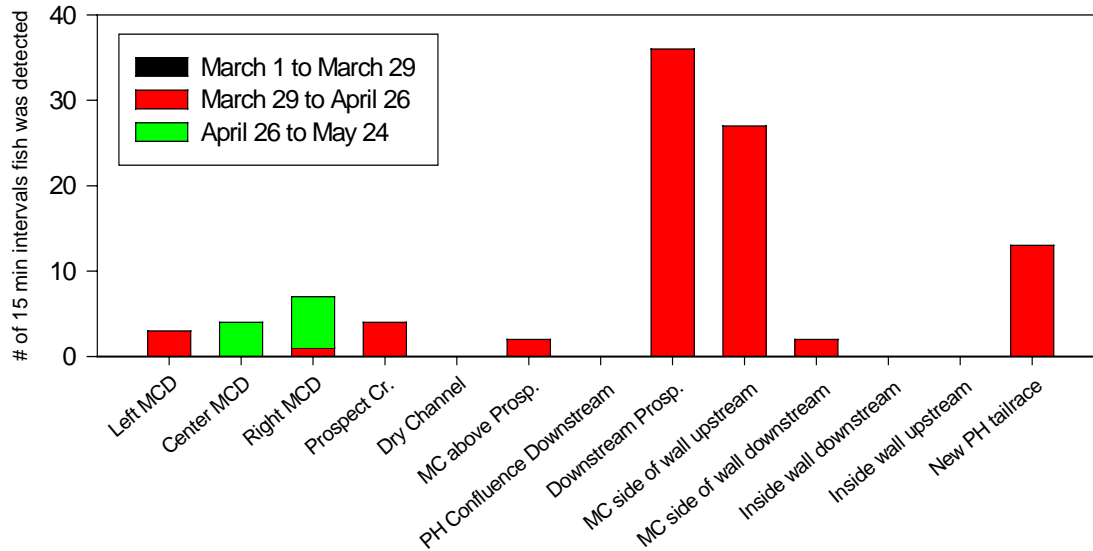


Figure 52. 2005 history for rainbow trout 148.640 code 46.

Captured: 4/5/05
Method: Trap
Location: Trap
Release Date: 4/5/05

Release Location: Squaw Creek
Total Length: 420 mm
Weight: 814 g
PIT Tag: 432D047E00

RBT 148.640 Code 50

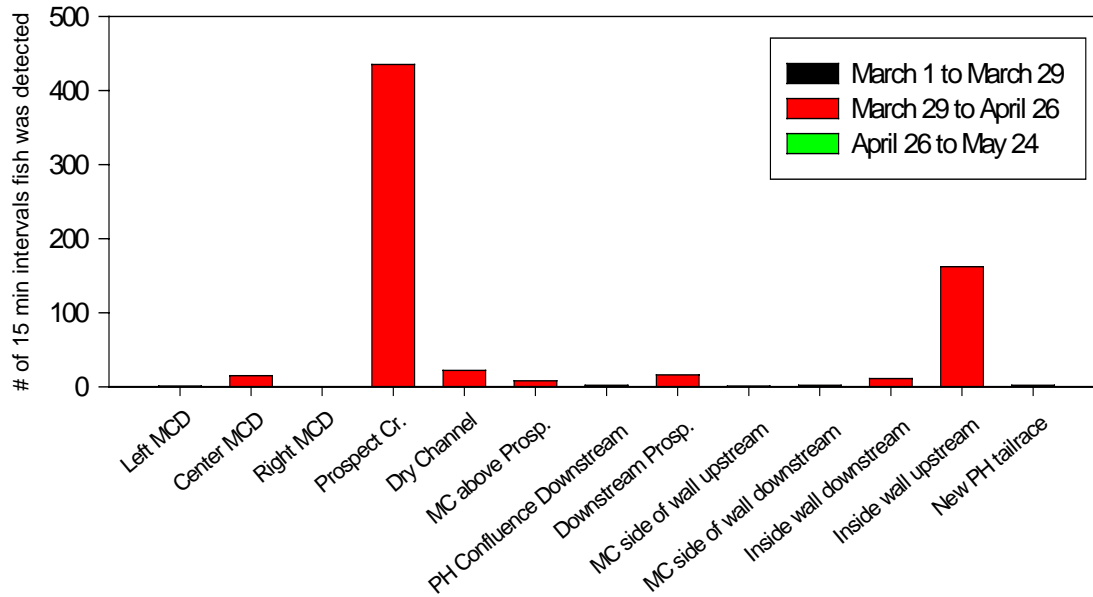


Figure 53. 2005 history for rainbow trout 148.640 code 50.

Captured: 4/5/05
Method: Trap
Location: Trap
Release Date: 4/5/05

Release Location: Squaw Creek
Total Length: 459 mm
Weight: 941 g
PIT Tag: 4229136423

RBT 148.740 Code 36

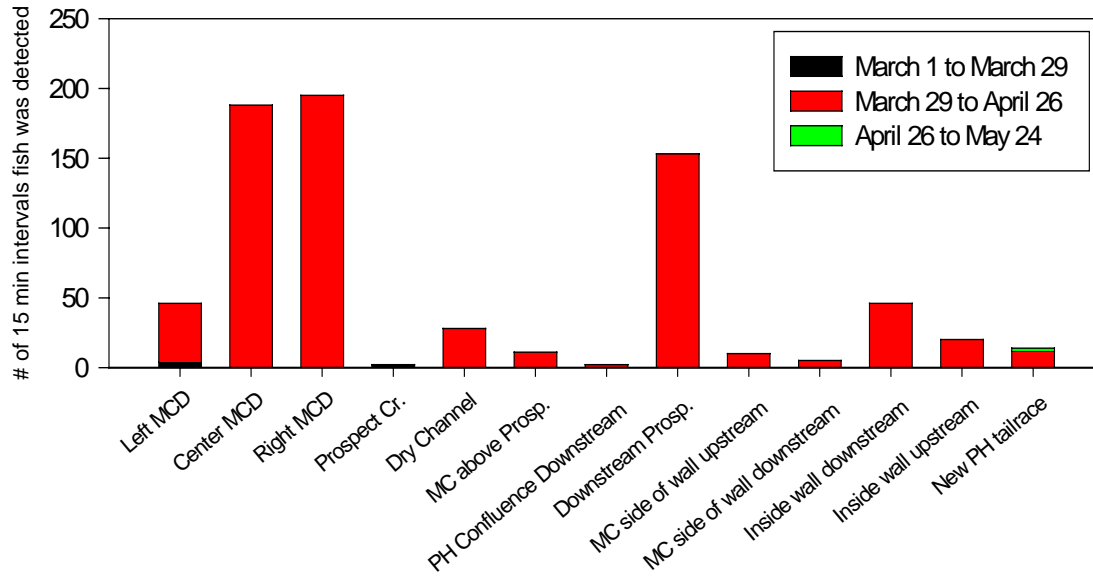


Figure 54. 2005 history for rainbow trout 148.740 code 36.

Captured: 3/18/05
Method: Trap
Location: Trap
Release Date: 3/18/05

Release Location: Squaw Creek
Total Length: 465 mm
Weight: 1006 g
PIT Tag: 985120006343007

RBT 148.740 Code 38

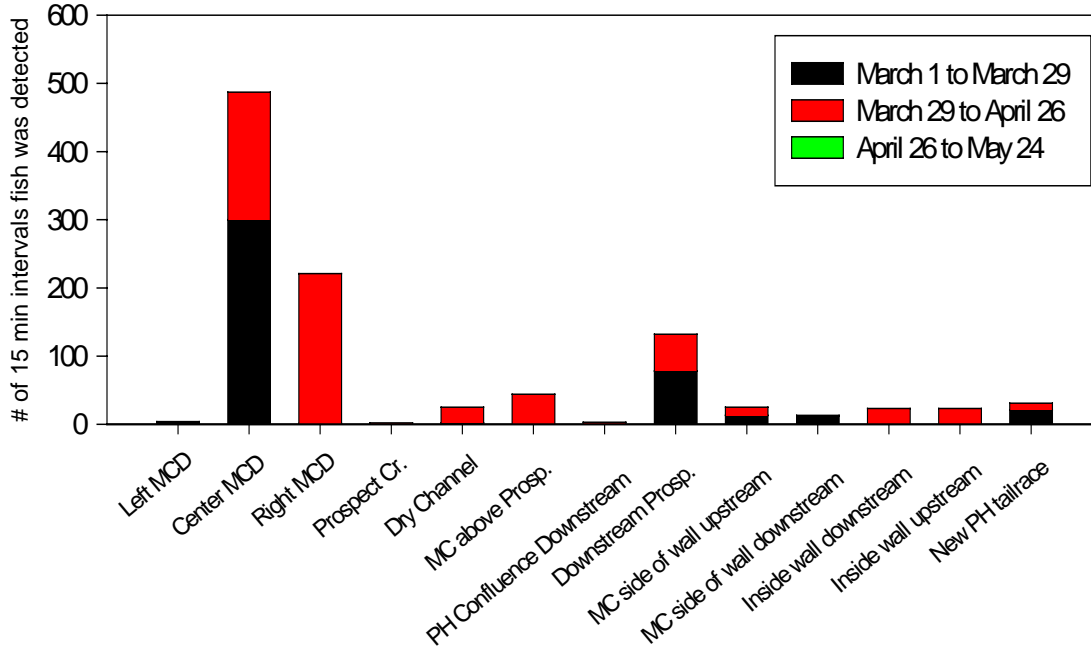


Figure 55. 2005 history for rainbow trout 148.740 code 38.

Captured: 3/29/05
Method: Trap
Location: Trap
Release Date: 3/29/05

Release Location: Squaw Creek
Total Length: 465 mm
Weight: 956 g
PIT Tag: 432E525E76

RBT 148.740 Code 40

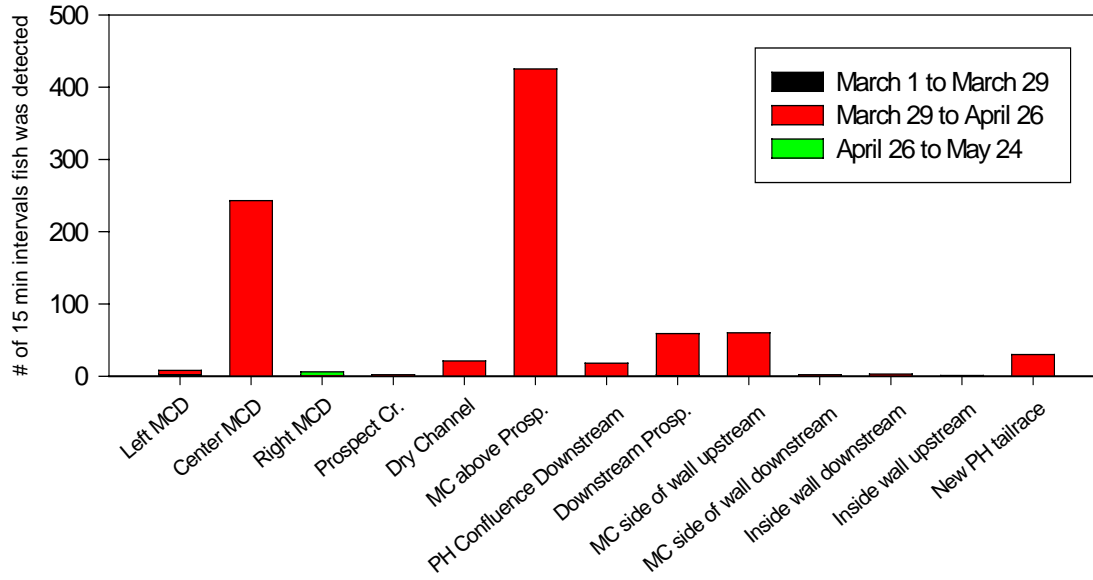


Figure 56. 2005 history for rainbow trout 148.740 code 40.

Captured: 4/5/05
Method: Trap
Location: Trap
Release Date: 4/5/05

Release Location: Squaw Creek
Total Length: 429 mm
Weight: 753 g
PIT Tag: 4225684d2d

RBT 148.740 Code 64

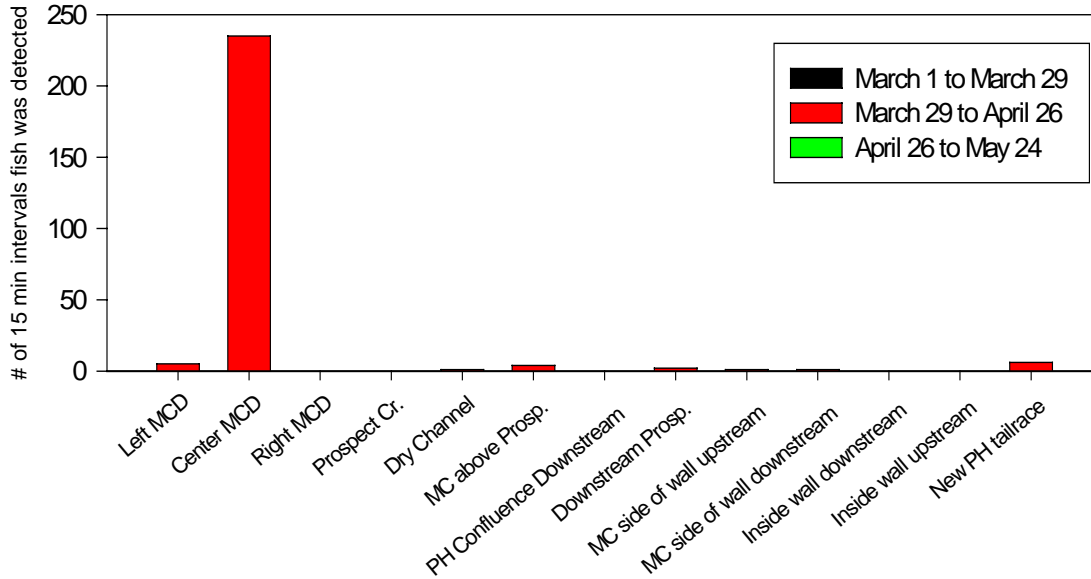


Figure 57. 2005 history for rainbow trout 148.740 code 64.

3.6 Main Channel Dam

When just evaluating the main channel dam area and the spill that occurred at either left, right, or center of the dam (looking downstream) we see that the location where the spill is occurring may be affecting fish behavior. Before spill occurred (April 14 to May 5) fish were being detected in the center of the dam most frequently (Figure 58). Fish began to move to the left side of the dam once spill began to occur at the right and center of the dam. This pattern was even stronger as spill increased in these locations. Once spill began to occur at the left side of the dam in concurrence with higher flows, fish were only detected at the left and center areas. Overall, fish tended to stay in either the center or left sides of the dam for the majority of the spill season.

2005 Thompson Falls Main Channel Dam Telemetry and Flow Data

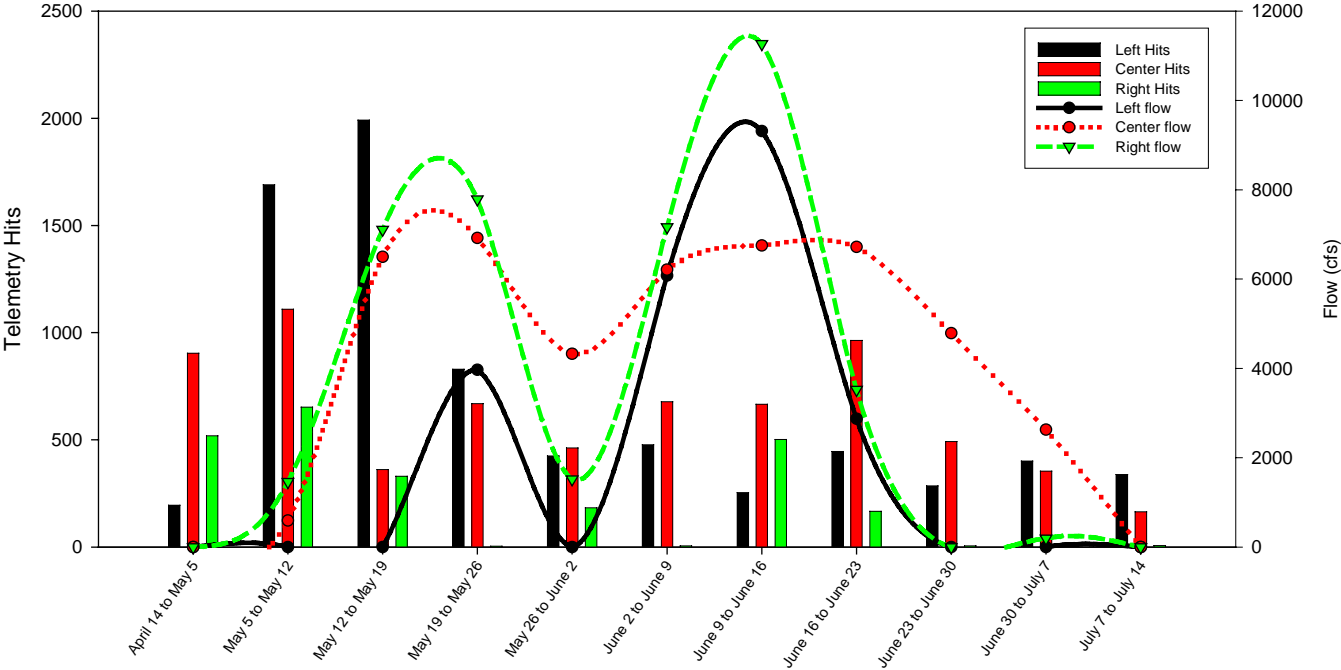


Figure 58. The number of telemetry hits for all species located at the main channel dam, separated by positioning on the dam and the location where spill was occurring at the main channel dam, 2005

4.0 Discussion

In all, it is apparent that a large proportion of fish that enter the Thompson Falls project area make their way to the area of the main Channel Dam, which is the upstream most terminus a fish can currently navigate. Possibly more significant, all six bull trout that were detected in the project area during 2005 made at least one foray to the main channel dam area. Also it should be noted that five of these six bull trout had been captured below Cabinet Gorge Dam and released near the Vermillion River, approximately 20 miles downstream of Thompson Falls Dam.

It is also apparent that spill at the main channel dam area seems to trigger fish that are already present in the project area to ascend to the main channel dam area. It was also interesting that fish remained in the main channel dam area even when spill surpassed 27,000 cfs.

Although the hilltop area had the greatest proportion of telemetry hits during 2005, many factors could be driving this. First, the hilltop station encompasses a much larger spatial area than the main channel dam station, therefore any fish moving around the project area inherently has a greater chance at being recorded by its antennas. Any fish ascending towards the main channel dam would first have to pass the hilltop station, and would be detected both on the upstream and downstream migration. Secondly, Prospect Creek is a major tributary of the lower Clark Fork River. For that reason, when we tag a migrating fish downstream of Thompson Fall Dam we are not sure if its natal stream is actually above Thompson Falls Dam or possibly in the Prospect Creek drainage. Thus, it is very conceivable that not all tagged fish would make the journey upstream of the mouth of Prospect Creek to the main channel dam area. Third, later in the summer when waters coming out of Thompson Falls Reservoir are elevated in temperature, Prospect Creek contributes a significant amount of cooler water to the area. Fish might be using that area as a cool water refuge and when doing so are being detected by the hilltop station.

Since we already have significant data from the Thompson Falls fish trap that fish do migrate to the main channel dam area, the results of the 2005 telemetry study add validity to this area as an option for a fish passage facility. Any fish passage facility downstream of the main channel dam area would have the potential to pass fish above the dam which are destined for the Prospect Creek drainage. In addition, since we observed fish migrating to the main channel dam area once spill began, in the future we may be able to duplicate this response earlier in the season by releasing waters as an attraction flow through the constructed fish passage facility.

Bull Trout

Although all the bull trout detected in the Thompson Falls project area during 2005 made at least one foray to the main channel dam, they actually spent a relatively small proportion of their time while in the project area near the main channel dam, when compared to the hilltop location, which includes the mouth of Prospect Creek.

One bull trout that was radio tagged by PPL Montana during 2004 was detected by the remote system in 2005. This bull trout was first detected on April 11, 2005 by the hilltop station. All other bull trout detected in 2005 were Avista tagged fish that were placed into Noxon Reservoir towards the end of May. Therefore, we don't know when these fish would initially move into the Thompson Falls project area if they had natural passage to the area. In other words, they may be delayed at Cabinet Gorge Dam by the dam and the trapping and tagging procedures that go with moving the bull trout over Cabinet Gorge and Noxon Rapids Dams.

Although our sample size was very small, we did not detect any substantial differences in behavior for bull trout with genetic codes from different tributaries. All Avista tagged bull trout made a short foray to the main channel dam and then dropped back to the hilltop area for the remainder of their time that they were detected by the remote telemetry array. The length of time each bull trout was detected in the project area differed, but again no discernable difference that might be related to tributary origin was observed.

Westslope cutthroat trout

A total of eight westslope cutthroat trout were detected by the remote receivers at Thompson Falls between April 14 and November 24, 2005. All eight westslope cutthroat trout were captured and radio tagged during 2005. Six of the eight fish were captured in the fish trap near the main channel dam. Of those six fish, four made at least one foray to the main channel dam after being released near Squaw Creek downstream. Two others were detected in the project, but did not make a foray to the main channel dam area.

Two westslope cutthroat trout detected by the telemetry equipment were captured via electrofishing downstream of the main channel dam. Both of these fish made at least one foray to the main channel dam after being released. In summary, four of the six westslope cutthroat trout that were captured in the fish trap made at least one foray to the main channel dam after being radio tagged and released, while both westslope cutthroat trout that were captured electrofishing made forays to the main channel dam after they were radio tagged and released.

Rainbow Trout

A total of 19 rainbow trout were detected by the remote telemetry array between April 14 and November 24, 2005. Of the total, 15 were originally captured in the fish trap, two were captured using hook and line, and two were captured using electrofishing. Four of the rainbow trout were radio tagged during 2004, while the remaining 15 were tagged in 2005.

Of the four rainbow trout that were radio tagged during 2004, three made at least one foray to the main channel dam during the 2005 telemetry season (April 14 to November 24). Of the 15 rainbow trout captured in the fish trap, 13 made at least one foray to the main channel dam, as did the two fish captured on hook and line, and one of the two rainbow trout captured electrofishing.

All four rainbow trout that were radio tagged during 2004 were detected in 2005 at the Thompson Falls project area during the March 1 to March 29 period. These fish lend valuable information on the timing that migratory rainbow trout may first ascend the Thompson Falls Dam on any given year.

Future analysis will need to be done to decipher where at the main channel dam an entrance to a fish passage facility would be most effective. It was apparent in 2005 that fish tended to hold in the waters on the left side of the dam more often than the right side. However, spill over the left side of the dam was usually much lower than over the right side of the dam. Interestingly, for a short period of time when the spill on the left side of the dam was at its maximum for the year, more fish signals were detected at the right side of the dam. This was also true for the period of time prior to spill. Consequently, there may be good holding water on the right side of the dam tailrace that deteriorates when spill begins entering that area.

The 2006 study season will be critical for determining if manipulating the spill operations at the main channel dam can stimulate the way fish behave in a manner that would optimize a fish passage facility's efficiency. It is important to understand that the behavior we observed in 2005 may be the result of the operations of spill that occurred and that changing the operations could change fish behavior and could potentially help us congregate more fish in an area where a passage facility could be built.

Appendix A. 2005 Thompson Falls Fish Capture Data-Recorded by MFWP

DATE	H2O Temp	TIME	Species	Length (mm)	Weight (g)	Recap?	PITT Tag NO.	Radio Freq.	Radio Code	Tag WT.	Genetic No.	Method	Collectors	Comments:
3/10/2005	7	1500	RBT	465	1555	n	985120007072873	n	n	n	n	A	JM,JS	scar on left side of body
3/17/2005	6	night	LMB	385	848	y	Floy-4-15042	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	LMB	482	2130	n	Floy-4-15586	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	LMB	392	862	y	Floy-4-15044	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	LMB	276	308	n	Floy-4-15587	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	LMB	317	505	n	Floy-4-15588	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	LMB	366	835	n	Floy-4-15589	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	LMB	234	175	n	Floy-4-15590	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	LMB	271	299	n	Floy-4-15591	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	NP	347	302	n	Floy-4-15592	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	NP	372	325	n	Floy-4-16026	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	NP	365	338	n	Floy-4-16027	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	NP	483	761	n	Floy-4-16028	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	NP	358	302	n	Floy-4-16029	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	NP	552	1370	n	Floy-4-16030	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	NP	635	2008	n	Floy-4-16031	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	NP	602	1678	n	Floy-4-16032	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	NP	568	1372	n	Floy-4-16033	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	NP	350	330	n	Floy-4-16034	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	RBT	239	150	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	LMB	138	37	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	RBT	337	389	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	220	175	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	227	150	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	190	88	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	182	79	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	201	98	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	175	60	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204

3/17/2005	6	night	YP	185	75	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	205	98	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	212	139	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	178	80	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	183	80	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	173	69	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	192	110	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	190	95	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	156	40	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	192	110	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	222	160	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	200	92	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	157	47	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	217	150	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	177	80	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	172	56	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	208	118	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	181	79	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	184	81	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	177	62	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	192	107	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	208	115	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	171	80	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	184	70	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	210	140	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	181	75	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	205	120	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	165	55	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	185	67	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	180	80	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	179	75	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	182	79	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204

3/17/2005	6	night	YP	218	150	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	162	57	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	170	72	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	178	80	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	152	41	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	190	90	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	195	92	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	182	98	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	171	85	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	222	162	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	188	92	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	177	100	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	191	79	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	YP	82	89	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	LMB	160	53	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	LMB	162	45	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	PUMP	138	60	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2204
3/17/2005	6	night	PUMP	137	59	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2205
3/17/2005	6	night	PUMP	142	55	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2206
3/17/2005	6	night	BG	145	70	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2207
3/17/2005	6	night	PUMP	156	89	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2208
3/17/2005	6	night	BBH	216	171	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2209
3/17/2005	6	night	BBH	235	239	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2210
3/17/2005	6	night	BBH	207	131	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2211
3/17/2005	6	night	BBH	253	279	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2212
3/17/2005	6	night	BBH	213	155	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2213
3/17/2005	6	night	BBH	215	171	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2214
3/17/2005	6	night	BBH	220	180	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2215
3/17/2005	6	night	BBH	170	71	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2216
3/17/2005	6	night	BBH	242	220	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2217
3/17/2005	6	night	BBH	220	171	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2218
3/17/2005	6	night	BBH	243	210	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2219

3/17/2005	6	night	BBH	218	160	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2220
3/17/2005	6	night	BBH	210	147	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2221
3/17/2005	6	night	BBH	232	179	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2222
3/17/2005	6	night	BBH	227	152	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2223
3/17/2005	6	night	BBH	227	201	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2224
3/17/2005	6	night	BBH	231	191	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2225
3/17/2005	6	night	BBH	242	299	n	n	n	n	n	n	EF	JM,BM,TS	start 2045, end 2226
3/18/2005	5	915	RBT	410	623	n	98512000768264	148.640	35	10g	n	T	JM,JS	clove 0942, start 0950, end 0955, ripe female 3 staples
3/18/2005	5	915	RBT	465	1006	n	985120006343007	148.740	38	10g	n	T	JM,JS	clove 0933, start 0937, end 0940
3/21/2005	4	1430	NF	n	n	n	n	n	n	n	n	A	JM	open trap 3/20/05 1530
3/21/2005	4	900	NF	n	n	n	n	n	n	n	n	T	JM,JS	
3/22/2005	4	850	NF	n	n	n	n	n	n	n	n	T	JM,JS	
3/23/2005	4.5	1019	NF	n	n	n	n	n	n	n	n	T	JM,JS	
3/24/2005	4	935	NF	n	n	n	n	n	n	n	n	T	JM,JS	
3/25/2005	5	1050	NF	n	n	n	n	n	n	n	n	T	JM,JS	
28-Mar	4	903	NF	n	n	n	n	n	n	n	n	T	JM,JS	open trap 3/27/05 0900
3/29/2005	5	1000	RBT	465	956	n	432E525E76	148.740	40	10g	n	T	JM,JS	MS 1010, start 1021, finish 1025, three staples, release at Squaw Cr. 1045, H2O 5.5

3/30/2005	5	930	RBT	460	1025	n	422548E2D	148.640	31	10g	n	T	JM,JS	MS 0954, start 1001, finish 1011 4 staples, release Squaw Cr. 1053, H2O 6
3/30/2005	5	930	WCT	371	575	n	4225645D08	148.640	33	10g	1	T	JM,JS	MS 1018, start 1022, finish 1025, 3 staples, release at Squaw Cr. 1053, H2O 6
3/31/2005	5.5	1010	NF	n	n	n	n	n	n	n	n	T	JM,JS	n
4/1/2005	6	930	RBT	444	865	n	432d375479	148.740	37	10g	n	T	JM,JS	MS 0941, start 0946, finish,0952 release Squaw Cr H2O 6, closed trap 0930
4/4/2005	n		n	n	n	n	n	n	n	n	n	n	JM,JS	trap not opened, water over top of dam for three hours 4/2/05, repair trap
4/5/2005	6	1010	RBT	420	814	n	432D047E00	148.640	50	10g	n	T	JM,JS	MS1105, start,1111 stop1114, 3 staples, release site Squaw Cr. 1135
4/5/2005	6	1010	RBT	459	941	n	4229136423	148.740	36	10g	n	T	JM,Js	MS 1028, start1035 Finish1037, 4 staples
4/5/2005	6	1010	RBT	429	753	n	4225684d2d	148.740	64	10g	n	T	JM,JS	MS1038, start1043, stop
4/5/2005	6	1010	RBT	513	1176	yes	432C1B5168	148.740	65	10g	n	T	JM,JS	MS1053, start 1059, finish 1102 4 staples, release Squaw cr. 1135
4/6/2005	6	1004	NF	n	n	n	n	n	n	n	n	T	JM,JS	
4/7/2005	5.5	854	NF	n	n	n	n	n	n	n	n	T	JM, JS	Close trap 0850
4/11/2005	6.5	2200	RBT	362	454	n	985120019769920	148.300	70	7g	n	EF	JM,BM,TS	one minute forty five second surgery, lite blood

4/11/2005	6.5	2200	RBT			yes	432C1B5168	148.740	65	10g	n	EF	JM,BM,TS	burns from electrofishing
4/11/2005	6.5	2200	RBT			yes	4225684d2d	148.740	64	10g	n	EF	JM,BM,TS	burns from electrofishing
4/11/2005	6.5	2200	RBT			yes	432E525E76	148.740	40	10g	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	BRN	425	751	n	985120019767901	148.740	60	10g	n	EF	JM,BM,TS	three minute and ten second surgery, lite blood
4/11/2005	6.5	2200	RBT	541	1230	n	985120019810616	148.740	62	10g	n	EF	JM,BM,TS	one minute and fifty second surgery,lite blood
4/11/2005	6.5	2200	RBT	487	1147	n	985120019764670	148.740	63	10g	n	EF	JM,BM,TS	two minute surgery, blood,thick body
4/11/2005	6.5	2200	WCT	424	750	n	432B060945	148.740	59	10g	7	EF	JM,BM,TS	one minute fifty five second surgery
4/11/2005	6.5	2200	BRN	427	720	n	985120019765371	148.740	61	10g	n	EF	JM,BM,TS	one minute forty two second surgery
4/11/2005	6.5	2200	NP	682	3175	n	00938	n	n	n	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	RBT	162	40	n	n	n	n	n	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	RBT	201	70	n	n	n	n	n	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	RBT	208	82	n	n	n	n	n	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	SMB	187	81	n	n	n	n	n	n	EF	JM,BM,TS	

4/11/2005	6.5	2200	RBT	227	153	n	n	n	n	n	n	EF	JM,BM,TS
4/11/2005	6.5	2200	RBT	151	31	n	n	n	n	n	n	EF	JM,BM,TS
4/11/2005	6.5	2200	BRN	398	563	n	n	n	n	n	n	EF	JM,BM,TS
4/11/2005	6.5	2200	RBT	122	26	n	n	n	n	n	n	EF	JM,BM,TS
4/11/2005	6.5	2200	SMB	113	18	n	n	n	n	n	n	EF	JM,BM,TS
4/11/2005	6.5	2200	BLT	118	13	n	n	n	n	n	6	EF	JM,BM,TS
4/11/2005	6.5	2200	SMB	210	108	n	n	n	n	n	n	EF	JM,BM,TS
4/11/2005	6.5	2200	YP	159	42	n	n	n	n	n	n	EF	JM,BM,TS
4/11/2005	6.5	2200	BRN	392	547	n	n	n	n	n	n	EF	JM,BM,TS
4/11/2005	6.5	2200	SMB	227	167	n	16036	n	n	n	n	EF	JM,BM,TS
4/11/2005	6.5	2200	BLT	102	9	n	n	n	n	n	4	EF	JM,BM,TS
4/11/2005	6.5	2200	RBT	71	3	n	n	n	n	n	n	EF	JM,BM,TS
4/11/2005	6.5	2200	RBT	301	255	n	n	n	n	n	n	EF	JM,BM,TS

4/11/2005	6.5	2200	RBT	222	91	n	n	n	n	n	n	EF	JM,BM,TS	mort
4/11/2005	6.5	2200	RBT	86	3	n	n	n	n	n	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	RBT	162	38	n	n	n	n	n	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	SMB	350	600	n	16037	n	n	n	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	WCT	282	248	n	985120019766407	n	n	n	5	EF	JM,BM,TS	
4/11/2005	6.5	2200	RBT	282	212	n	n	n	n	n	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	SMB	138	40	n	n	n	n	n	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	SMB	128	35	n	n	n	n	n	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	SMB	110	23	n	n	n	n	n	n	EF	JM,BM,TS	
4/11/2005	6.5	2200	RBT	471	552	n	985120019726154	n	n	n	n	EF	JM,BM,TS	eight minute fifty second surgery, no tag implant, antenna would not fit through cathider
4/11/2005	6.5	2200	WCT	282	248	n	98512001976640	n	n	n		EF	JM,BM,TS	
4/11/2005	8	915	RBT	472	1014	n	985120019872965	n	n	n	n	T	JM,JS	Frayed dorsal
4/11/2005	8	915	WRHY	436	731	n	985120019869751	n	n	n	2	T	JM,JS	very faint orange slash, RBT spotting

4/11/2005	8	915	RBT	461	880	n	985120019715746	n	n	n	n	T	JM,JS	
4/11/2005	8	915	RBT	494	1225	n	985120019758351	n	n	n	n	T	JM,JS	
4/11/2005	8	915	WRHY	431	849	n	985120019767791	n	n	n	3	T	JM,JS	orange slash,
4/12/2005	4.5	2015	WCT	404	652	n	4528336F33	148.640	48	10g	10	EF	JM,BM,TS	two minute forty five second surgery, some blood
4/12/2005	4.5	2015	RBT	365	485	n	4523084504	n	n	n	n	EF	JM,BM,TS	water temp taken below Prospect Creek mouth,
4/12/2005	4.5	2015	RBT	458	485	n	4523313122	n	n	n	n	EF	JM,BM,TS	
4/12/2005	4.5	2015	RBT	448	935	n	4527433C7C	n	n	n	n	EF	JM,BM,TS	
4/12/2005	4.5	2015	RBT	291	259	n	4526450345	n	n	n	n	EF	JM,BM,TS	
4/12/2005	4.5	2015	RBT	440	908	n	452706772D	n	n	n	n	EF	JM,BM,TS	
4/12/2005	4.5	2015	RBT	359	498	n	452B19135F	n	n	n	n	EF	JM,BM,TS	
4/12/2005	4.5	2015	RBT	427	885	n	452B194A3D	n	n	n	n	EF	JM,BM,TS	
4/12/2005	4.5	2015	RBT	295	281	n	452A15346E	n	n	n	n	EF	JM,BM,TS	
4/12/2005	4.5	2015	RBT	280	275	n	4529644F26	n	n	n	n	EF	JM,BM,TS	

4/12/2005	4.5	2015	RBT	284	307	n	45267B4642	n	n	n	n	EF	JM,BM,TS	
4/12/2005	4.5	2015	BRN	217	124	n	452A205554	n	n	n	n	EF	JM,BM,TS	
4/12/2005	4.5	2015	BLT	167	30	n	n	n	n	n	8	EF	JM,BM,TS	
4/12/2005	4.5	2015	BLT	162	31	n	n	n	n	n	9	EF	JM,BM,TS	
4/12/2005	8	930	NF	n	n	n	n	n	n	n	n	T	JM,JS	west gate partially open , bottom of shoot submerged
4/13/2005	8	838	NF	n	n	n	n	n	n	n	n	T	JM, JS	
4/14/2005	7	930	NF	n	n	n	n	n	n	n	n	T	JM,JS	
4/15/2005	6	926	NF	n	n	n	n	n	n	n	n	T	JM,JS	close trap 0930
4/18/2005	9	924	RBT/WCT	547	1390	n	4523141D72	148.640	53	10g	n	T	JM,JS	seven minutes and forty ywo second
4/18/2005	9	1000	RBT	466	897	n	45274E1E04	148.640	46	10g	n	T	JM,JS	
4/18/2005	9	1008	RBT	489	1031	n	4527076C16	148.640	47	10g	n	T	JM,JS	
4/19/2005	9	930	NF	n	n	n	n	n	n	n	n	T	JM, JS	
4/20/2005	8	1020	RBT	487	1102	n	985120019767331	148.300	41	7.7	n	T	JM,JS	seven minute surgery, four staples, release Squaw Cr. 1181

4/20/2005	8	940	RBT	514	1322	n	985120019749207	n	n	n	n	T	JM,JS	
4/20/2005	8	950	RBT	384	540	n	45276D577C	n	n	n	n	T	JM,JS	
4/20/2005	8	959	RBT	431	643	n	45297F0E34	n	n	n	n	T	JM,JS	
4/20/2005	8	1005	RBT	463	1038	n	45290D481E	n	n	n	n	T	JM,JS	
4/20/2005	8	1020	RBT	449	842	n	432B042802 DEAD	n	n	n	n	T	JM,JS	six minute surgery, five staples, mort at release
4/20/2005	8	1020	RBT			yes						T	JM,JS	
4/21/2005	7.5	1949	RBT	465	945	n	985120019718471	148.300	67	7.7	n	EF	JM,BM,TS	full of eggs, two minute and fifty second surgery
4/21/2005	7.5	1949	RBT			yes	45274E1E04	148.640	39	10g	n	EF	JM,BM,TS	staples look good
4/21/2005	7.5	1949	RBT			yes	4527076C16	148.640	47	10g	n	EF	JM,BM,TS	sutures look good
4/21/2005	7.5	1949	BLT	730	5021	n	985120019719873	148.640	54	10g	12	EF	JM,BM,TS	lower caudel deformed
4/21/2005	7.5	1949	RBT			yes	45283D2A4F	n	n	n	n	EF	JM,BM,TS	
4/21/2005	7.5	1949	RBT	430	770	n	45231A4953	n	n	n	n	EF	JM,BM,TS	
4/21/2005	7.5	1949	RBT	252	375	n	44293F2507	n	n	n	n	EF	JM,BM,TS	

4/21/2005	7.5	1949	RBT	350	440	n	45296B6272	n	n	n	n	EF	JM,BM,TS
4/21/2005	7.5	1949	RBT	200	160	n	n	n	n	n	n	EF	JM,BM,TS
4/21/2005	7.5	1949	RBT	130	11	n	n	n	n	n	n	EF	JM,BM,TS
4/21/2005	7.5	1949	NP	n	n	yes	OO938	n	n	n	n	EF	JM,BM,TS
4/21/2005	7.5	1949	NP	690	4989	n	OO933	n	n	n	n	EF	JM,BM,TS caught by angler at Finley Flats 12/10/05
4/21/2005	7.5	1949	RBT	n	n	yes	4523141D72	n	n	n	n	EF	JM,BM,TS
4/21/2005	7.5	1949	RBT	326	340	n	452A5C3D29	n	n	n	n	EF	JM,BM,TS
4/21/2005	7.5	1949	RBT	283		yes	5429644F26	n	n	n	n	EF	JM,BM,TS
4/21/2005	7.5	1949	RBT	303	322	n	985120019760535	n	n	n	n	EF	JM,BM,TS
4/21/2005	7.5	1949	RBT	408	660	n	985120019869404	n	n	n	n	EF	JM,BM,TS
4/21/2005	7.5	1949	RBT	401	735	n	985120019869404	n	n	n	n	EF	JM,BM,TS
4/21/2005	7.5	1949	RBT	232	199	n	n	n	n	n	n	EF	JM,BM,TS
4/21/2005	7.5	1949	RBT	112	11	n	n	n	n	n	n	EF	JM,BM,TS

4/21/2005	7.5	1949	SMB	278	275	n	16038	n	n	n	n	EF	JM,BM,TS	
4/21/2005	7.5	1949	SMB	292	322	n	16039	n	n	n	n	EF	JM,BM,TS	
4/21/2005	7.5	1949	SMB	285	288	n	16040	n	n	n	n	EF	JM,BM,TS	
4/21/2005	7.5	1949	SMB	248	215	n	16041	n	n	n	n	EF	JM,BM,TS	
4/21/2005	7.5	1949	YP	169	65	n	n	n	n	n	n	EF	JM,BM,TS	
4/21/2005	7.5	1949	SMB	173	82	n	n	n	n	n	n	EF	JM,BM,TS	
4/21/2005	7.5	1949	YP	211	138	n	n	n	n	n	n	EF	JM,BM,TS	
4/21/2005	7.5	1949	RBT	149	31	n	n	n	n	n	n	EF	JM,BM,TS	
4/21/2005	7.5	1949	Bullhead	265	285	n	n	n	n	n	n	EF	JM,BM,TS	
4/21/2005	7.5	1949	BLT	300	202	n	985120019871665	n	n	n	13	EF	JM,BM,TS	4569 seconds total of shocking time
4/21/2005	9	920	NF	n	n	n	n	n	n	n	n	T	JM,JS	
4/22/2005	9	915	WCT	406	735	n	985120019719126	148.300	73	7.7g	14	T	JM,JS	two minute forty three second surgery, three sutures, release Squaw Cr., 1010
4/25/2005	10	1015	RBT	464	1026	n	n	n	n	n	n	T	JM,JS	release BPPLD, open trap 0900, H2O10

4/26/2005	11	930	WCT	424	709	n	985120019700978	148.300	72	7.7g	14	T	JM,JS	two minute surgery, release Squaw Cr. 1035,three staples, H2O 6
4/26/2005	11	930	RBT	441	922	n	n	n	n	n	n	T	JM,JS	
4/26/2005	11	930	RBT	425	801	n	n	n	n	n	n	T	JM,JS	
4/26/2005	11	930	RBT	466	1110	n	n	n	n	n	n	T	JM,JS	
4/26/2005	11	930	RBT	343	447	n	n	n	n	n	n	T	JM,JS	
4/27/2005	10	900	WCT	384	519	n	985120019758878	148.300	44	7.7g	15	T	JM,JS	two minute surgery, three staples, release Squaw CR. 1005, H2O 6, water over top of dam
4/27/2005	10	900	RBT	397	661	n	n	n	n	n	n	T	JM,JS	
4/27/2005	10	900	RBT	465	1086	n	n	n	n	n	n	T	JM,JS	
4/27/2005	10	900	RBT	315	333	n	n	n	n	n	n	T	JM,JS	
4/27/2005	10	900	RBT	429	681	n	n	n	n	n	n	T	JM,JS	
4/27/2005	10	900	RBT	371	564	n	n	n	n	n	n	T	JM,JS	
4/27/2005	10	900	NPM	295	265	n	n	n	n	n	n	T	JM,JS	take for education

4/27/2005	10	900	NPM	481	1035	n	n	n	n	n	n	T	JM,JS	take for education
4/28/2005	n	900	NF	n	n	n	n	n	n	n	n	T	JM,JS	could not get to trap, water over top of entire dam,boards being pulled 0900,checked trap at 1300, 9 boards pulled
4/28/2005	n	1300	Rbt	n	n	n	n	n	n	n	n	T	JM,JS	release BPPLD
5/2/2005	9	1020	WCT	321	343	n	467339711A	n	n	n	16	T	JM,JS	too little to radio tag
5/2/2005	10	2044	BRN	321	324	n	n	n	n	n	n	T	JM,JS	release BPPLD
5/2/2005	10	2220	RBT	373	561	n	n				n	T	JM,JS	release BPPLD
5/3/2005	8	840	WCT	386	582	n	4669340C75	148.300	45	7.7g	17	T	JM,JS	five minute surgery, 3 staples, release Squaw Cr. 0920
5/3/2005	8	748	RBT	354	398	n	46696c0916	n	n	n	n	T	JM,JS	scar behind head
5/3/2005	8	801	RBT	433	846	n	965D4A0E6E	n	n	n	n	T	JM,JS	
5/3/2005	8	801	RBT	413	651	n	466C0B3D40	n	n	n	n	T	JM,JS	
5/4/2005	10	907	WCT	378	560	yes	4225645D08	148.640	33	7.7	n	T	JM,JS	no staples in fish, replaced with 3 sutures, four minute surgery, release Squaw Cr. 1015, H2O 7
5/4/2005	10	907	RBT	500	1048	n	985120019767748	n	n	n	n	T	JM,JS	lower caudel torn off, scar behind head,release,BPPLD

5/5/2005	10	1000	WCT	373	446	n	985120019769888	148.300	68	7.7	18	T	JS,KD	fifteen minute surgery, frayed antenna, release Squaw cr. 1119
5/5/2005	10	915	RBT	400	623	n	465D406929	n	n	n	n	T	JM,JS	release BPPLD
5/5/2005	10	915	LSS	455	976	n	n	n	n	n	n	T	JM,JS	take for education
5/6/2005	11	910	NF	n	n	n	n	n	n	n	n	T	JS,KD	closed trap 0900
5/9/2005	n	900	NF	n	n	n	n	n	n	n	n	T	JM,JS	unable to angle, 13 panals open and one radial gate
5/10/2005	n	900	NF	n	n	n	n	n	n	n	n	T	JM,JS	13 panals open
5/12/2005		900	NF	n	n	n	n	n	n	n	n	T	JM,JS	Take out trap, 47 panals open
7/27/2005	21	2130	NF	n	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
7/27/2005	21	2300	NF	n	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
7/27/2005	21	2430	NF	n	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
7/27/2005	21	145	NPM	256	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
7/27/2005	21	145	NPM	265	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
7/28/2005	21	2015	NF		n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport

7/28/2005	21	2230	NPM	321	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
7/28/2005	21	2430	NF		n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
7/28/2005	20	200	NPM	530	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
7/28/2005	20	200	NPM	240	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
7/28/2005	20	200	NPM	310	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
8/3/2005	21	2100	NF	n	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
8/3/2005	21	2230	NF	n	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
8/3/2005	21	2400	NF	n	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
9/22/2005	14	900	NPM	467	n	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
9/23/2005	14	1242	SMB	16	10	n	n	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
9/23/2005	14	1242	KS	375	448	n	4660216A09	n	n	n	n	T	JM, TH	run trap at night for Bull trout transport
9/25/2005	11	925	NF	n	n	n	n	n	n	n	n	T	JM,JS	
9/28/2005	11	940	NF	n	n	n	n	n	n	n	n	T	JM,JS	Trap had been closed by the Public

9/29/2005	12	930	NF	n	n	n	n	n	n	n	n	T	JM,JS	
9/30/2005	12	1120	NF	n	n	n	n	n	n	n	n	T	BL,JS	Closed trap 1115
10/3/2005	12	1035	NF	n	n	n	n	n	n	n	n	T	TC,JS	
10/5/2005	11	1233	SMB	100	60	n	n	n	n	n	n	T	JM,JS	Radial gate open. Sandbags blown out
10/18/2005		1400											JM,JS	remove trap box
10/25/2005	9	20:50	RBT	358	396	n	4669665270	148.300	72a	7.7g	n	EF	JM,BM,	Little Blood,4:17 surgery, 3 staples
10/25/2005	9	20:50	RBT	431	713	n	466D152A07	148.640	52	10g	n	EF	JM,BM,	3 staples, 1:41 surgery
10/25/2005	9	20:50	RBT	338	327	n	n	n			n	EF	JM,BM,	
10/25/2005	9	20:50	RBT	316	322	n	n	n	n	n	n	EF	JM,BM,	
10/25/2005	9	20:50	RBT	282	228	n	n	n	n	n	n	EF	JM,BM,	
10/25/2005	9	20:50	RBT	318	289	n	n	n	n	n	n	EF	JM,BM,	
10/25/2005	9	20:50	RBT	461	693	n	n	n	n	n	n	EF	JM,BM,	Hook scar,laceration to side,no surgery
10/25/2005	9	20:50	RBT	321	320	n	n	n	n	n	n	EF	JM,BM,	

10/25/2005	9	20:50	RBT	252	140	n	n	n	n	n	n	EF	JM,BM,	
10/25/2005	9	20:50	RBT	338	339	n	n	n	n	n	n	EF	JM,BM,	
10/25/2005	9	20:50	RBT	302	243	n	n	n	n	n	n	EF	JM,BM,	
10/25/2005	9	20:50	RBT	327	321	n	n	n	n	n	n	EF	JM,BM,	
10/25/2005	9	20:50	SMB	170	64	n	n	n	n	n	n	EF	JM,BM,	
10/25/2005	9	20:50	SMB	301	463	n	n	n	n	n	n	EF	JM,BM,	
11/15/2005	3.9	17:30	RBT	461	661	n	46693E655A	148.300	71	7.7g	n	EF	JS,BM	1min 30sec, staples, much blood
11/15/2005	3.9	17:30	WCT	376	464	n	466941294D	148.300	66	7.7g	n	EF	JS,BM	1min 56sec
11/15/2005	3.9	17:30	WRHY	410	632	n	4669575C77	148.300	48	7.7g	n	EF	JS,BM	1min 55sec, 3 staples
11/15/2005	3.9	17:30	WRHY	372	502	n	466C58466B	148.300	42	7.7g	n	EF	JS,BM	2min 50sec, 3 staples
11/15/2005	3.9	17:30	RBT	399	683	n	465C746D20	148.640	46a	10g	n	EF	JS,BM	1min 35sec, 4 staples
11/15/2005	3.9	17:30	RBT	467	1027	n	465D0F4F4D	148.640	35a	10g	n	EF	JS,BM	2min 22sec
11/15/2005	3.9	17:30	RBT	406	709	n	465A683921	148.640	49	10g	n	EF	JS,BM	1min 20sec, 3 staples

11/15/2005	3.9	17:30	RBT	421	729	n	466D005312	148.640	55	10g	n	EF	JS,BM	3min 10sec, staples
11/15/2005	3.9	17:30	RBT	425	830	n	466C4F210F	148.640	51	10g	n	EF	JS,BM	2min, staples
11/15/2005	3.9	17:30	RBT	485	1126	n	466B6C3D06	148.740	57	10g	n	EF	JS,BM	4min 13sec, staples
11/15/2005	3.9	17:30	RBT	484	904	n	466C286E34	148.740	56	10g	n	EF	JS,BM	4min 40sec, staples
11/15/2005	3.9	17:30	RBT	397	644	n	466965B450	148.740	58	10g	n	EF	JS,BM	3min 45sec
11/15/2005	3.9	17:30	RBT	232	125	n	n	n	n	n	n	EF	JS,BM	mort
11/15/2005	3.9	17:30	RBT	307	257	n	n	n	n	n	n	EF	JS,BM	
11/15/2005	3.9	17:30	RBT	377	397	n	n	n	n	n	n	EF	JS,BM	
11/15/2005	3.9	17:30	RBT	313	316	n	n	n	n	n	n	EF	JS,BM	
11/15/2005	3.9	17:30	RBT	458	782	n	n	n	n	n	n	EF	JS,BM	broken back
11/15/2005	3.9	17:30	BRN	341	362	n	n	n	n	n	n	EF	JS,BM	
11/15/2005	3.9	17:30	WCT	326	332	n	n	n	n	n	n	EF	JS,BM	
11/15/2005	3.9	17:30	WCT	287	258	n	n	n	n	n	n	EF	JS,BM	

Appendix B. 2005 Thompson Falls Reservoir Gill Netting, performed by MFWP and PPL Montana

2004	Length (mm)		Weight (g)		total n	# per net
	Mean	Range	Mean	Range		
Northern Pike	566.4	298-767	1592.3	170-3628.8	8	1.3
Largemouth bass	150.0	*	44.0	*	1	0.2
Smallmouth bass	326.5	325-328	588.0	577-599	2	0.3
Yellow perch	212.9	149-332	168.7	37-537	10	1.7
Pumpkinseed	136.5	125-148	55.0	41-69	2	0.3
Northern pike minnow	496.0	*	1162.0	*	1	0.2
Large scale sucker	429.8	238-525	931.0	126-1326	4	0.7
Black bullhead	206.1	125-250	168.9	30-261	17	2.8
TOTAL					45	7.5

2005	Length (mm)		Weight (g)		total n	# per net
	Mean	Range	Mean	Range		
Northern Pike	543.9	275-755	1384.0	128-3502	18	1.8
Largemouth bass	*	*	*	*	0	0.0
Smallmouth bass	346.0	*	659.0	*	1	0.1
Yellow perch	222.0	150-256	146.3	42-246	7	0.7
Pumpkinseed	115.0	*	35.0	*	1	0.1
Northern pike minnow	383.0	210-498	693.7	76-1137	3	0.3
Largescale sucker	496.0	447-571	1296.3	1036-1740	13	1.3
Peamouth	361.0	*	486.0	*	1	0.1
Black bullhead	185.7	130-264	112.5	35-306	34	3.4

TOTAL						78	7.8
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Species	2004 total	2005 total	2004 # /net	2005 # /net	2004 CPUE (#/hr)	2005 CPUE (#/hr)
Northern Pike	8	18	1.3	1.8	0.07	0.1
Largemouth bass	1	0	0.2	0	0.01	0
Smallmouth bass	2	1	0.3	0.1	0.02	0.01
Yellow perch	10	7	1.7	0.7	0.08	0.04
Pumpkinseed	2	1	0.3	0.1	0.02	0.01
Northern pikeminnow	1	3	0.2	0.3	0.01	0.02
Largescale sucker	4	13	0.7	1.3	0.03	0.07
Peamouth	0	1	0	0.1	0.00	0.18
Black bullhead	17	34	0.7	3.4	0.14	0.01
TOTAL	45	78	7.5	7.8	0.38	0.42

Thompson Falls Reservoir Gill Net Catch

