Idaho Water Transaction Program
2010 Monitoring and Evaluation Report

Introduction

During 2010, the Idaho Water Resource Board (IWRB) monitored the following 21 water transactions in the Upper Salmon River Basin:

- Alturas Lake Creek non-pivot (2007 – 2011)
- Beaver Creek and Salmon River above Alturas Lake Creek (2005-2014)
- Big Hat Creek (2010-2014)
- Big Timber Creek Tyler (2010-2029)
- Lower Eighteenmile Creek – Ellsworth (2006-2015)
- Fourth of July Creek (2009-2028)
- Iron Creek 2007 – Phase II (2007-2026)
- Lower Lemhi (2010)
- Lower Lemhi Permanent – Bird
- Lower Lemhi Permanent – Cheney
- Lower Lemhi Permanent – Demick
- Lower Lemhi Permanent – Fisher
- Lower Lemhi Permanent - Olson
- Lower Lemhi Permanent – Bob Thomas
- Lower Lemhi Permanent – Kim Thomas
- Lower Lemhi Permanent – Wolters
- Lower Lemhi Thomas (2010-2021)
- Morgan Creek (2009-2013)
- Pahsimeroi P-9 Bowles (2008-2027)
- Pahsimeroi P-9 Charlton (2008-2027)
- Pahsimeroi P-9 Dowton (2008-2027)
- Pahsimeroi P-9 Elzinga (2008-2027)
- Pole Creek (2006-2010)
- Whitefish Ditch (2008-2026)

These projects increased flows and provided valuable fish habitat and passage on more than 188 river miles in the Upper Salmon River Basin.

Alturas Lake Creek – Stanley Basin

IDWR negotiated a transaction with Katie Breckenridge in 2007. The Alturas Lake Creek non-pivot 2007 project is a five-year lease which leaves 2.66 cfs, formerly irrigating 45 acres, in the creek. The water is leased from May 1st through October 31st. The leased water restores the natural flow to Alturas Lake Creek, improving Chinook salmon and steelhead habitat.

Site visits to Alturas Lake Creek 6/1/2010 and 7/3/2010 confirmed that the landowner was complying with the terms of the lease (Figure 1). Landsat images also show that the leased water was not being used to irrigate land (Figure 2). A gage in Alturas Lake Creek monitored flow in the river during the irrigation season (Figures 3 and 4).

Figure 1. Breckenridge water right place of use with no active irrigation July 3, 2010.

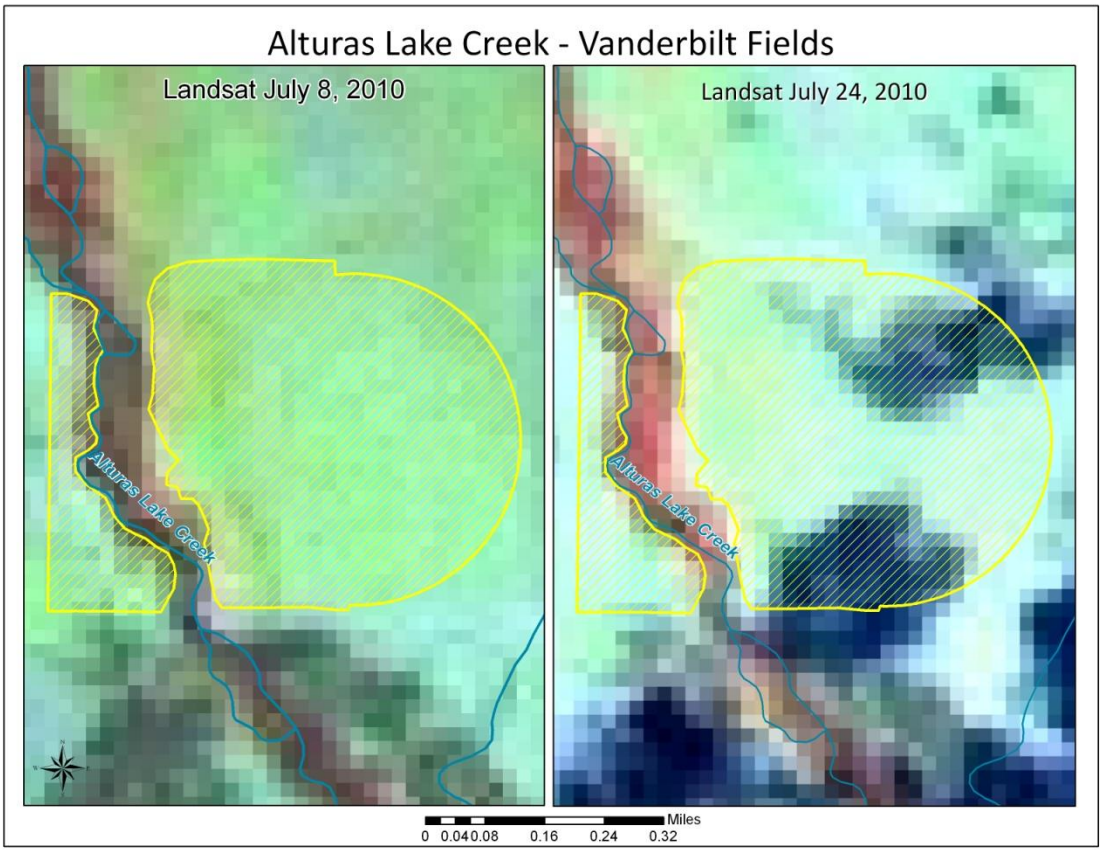

Figure 2. Landsat satellite imagery of the Alturas Lake Creek leased fields. Red indicates high evapo-transpiration rates.

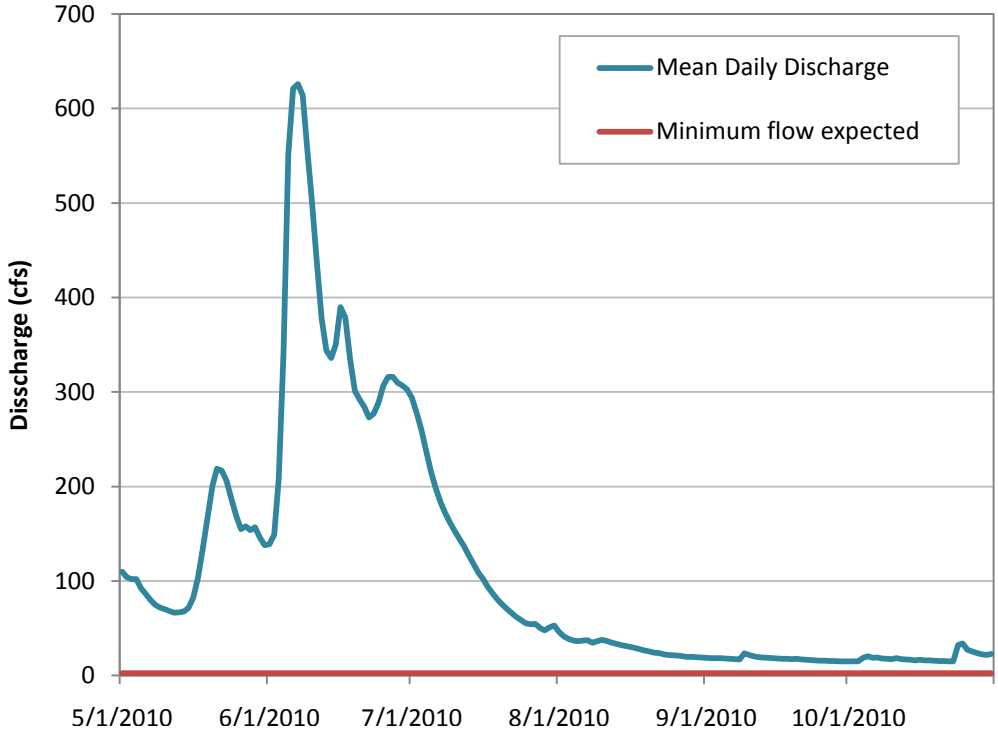

Figure 3. Alturas Lake Creek mean daily flow at Pettit Lane, May 1 to October 31, 2010.

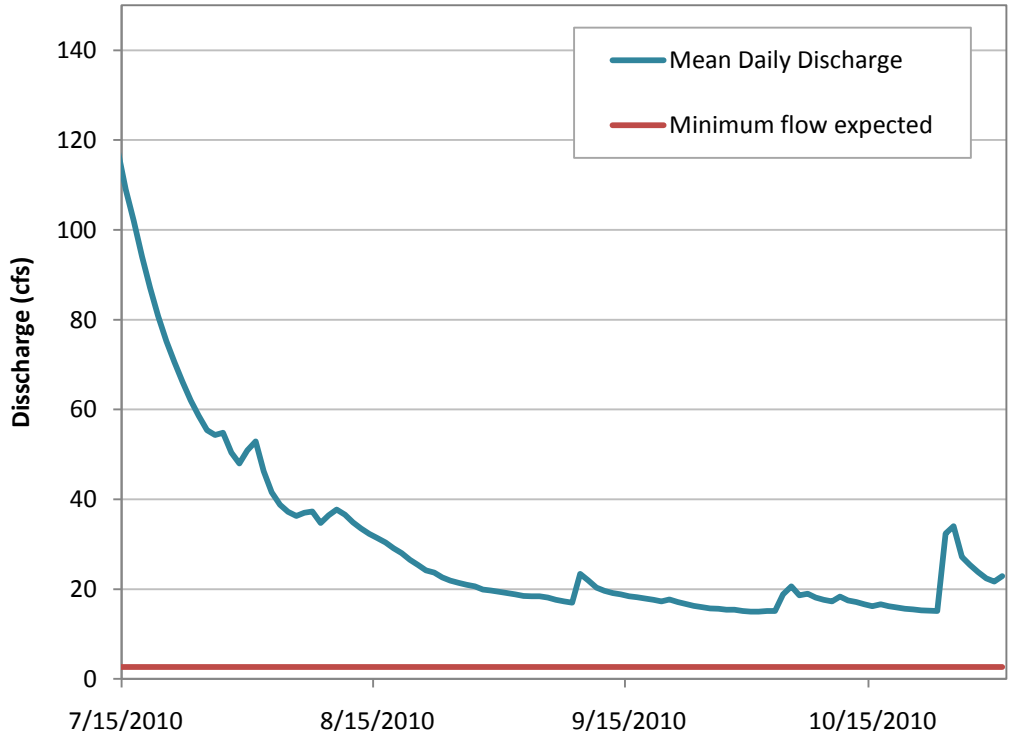

Figure 4. Alturas Lake Creek mean daily flow at Pettit Lane, July 15 to October 31, 2010.

Idaho Department of Fish and Game (IDFG) conducted Chinook salmon redd surveys in 2010 and found the 15 redds in Alturas Lake Creek below the original point of diversion. A logger placed below the Pettit Lake Road bridge, recorded water temperature every 2 hours between June 2, 2010 and October 5, 2010 (Figure 5).

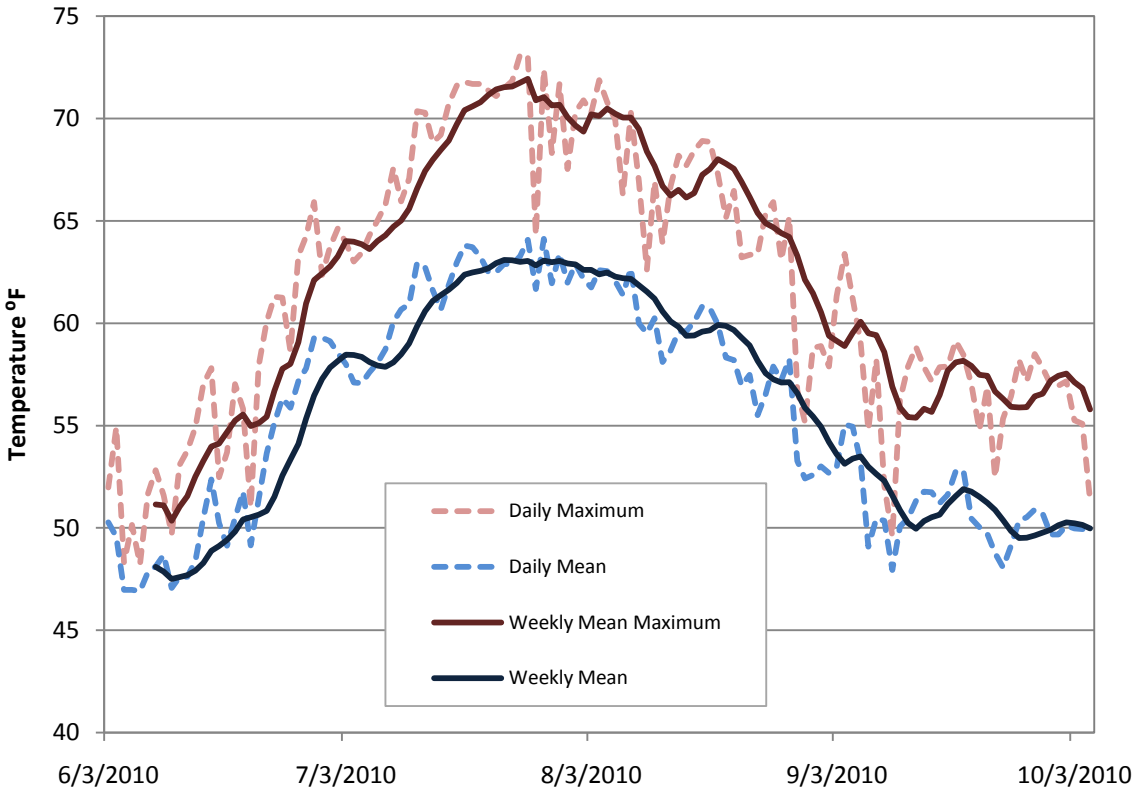

Figure 5. Alturas Lake Creek (below Pettit Lake Road bridge) water temperature data (°F) as collected by HOBO Tidbit logger measuring every two hours from June 3 – October 5, 2010.

Beaver Creek – Stanley Basin

The Beaver Creek project was IDWR's first long-term lease. In the sixth year of the ten-year transaction, D.O.T., LLP leased 8.77 cfs, formerly irrigating 241 acres. The water is leased from May 1st through October 15th. When the water is available, this connects approximately 0.8 miles of lower Beaver Creek to the Salmon River, providing cool water and fish access to the upper reaches of Beaver Creek.

Site visits to Beaver Creek on 6/1/2010 and 7/3/2010 confirmed that the landowner was complying with the terms of the lease (Figure 6). Landsat images also show that the leased water was not being used to irrigate land (Figure 7). Photo points in the primary reach documented changes to the riparian vegetation (Figures 8-9). A gage in Beaver Creek monitored flow in the river during the irrigation season (Figures 10-11). The leased water provided a reconnect to Beaver Creek through early July. After early July, the flow in Beaver Creek dropped

below levels that would provide reconnection. Although the flows did not provide fish passage, they most likely provided groundwater recharge and cooler sub-surface flows to the upper Salmon River.

Figure 6. DOT LLP water right place of use with no active irrigation July 3, 2010.

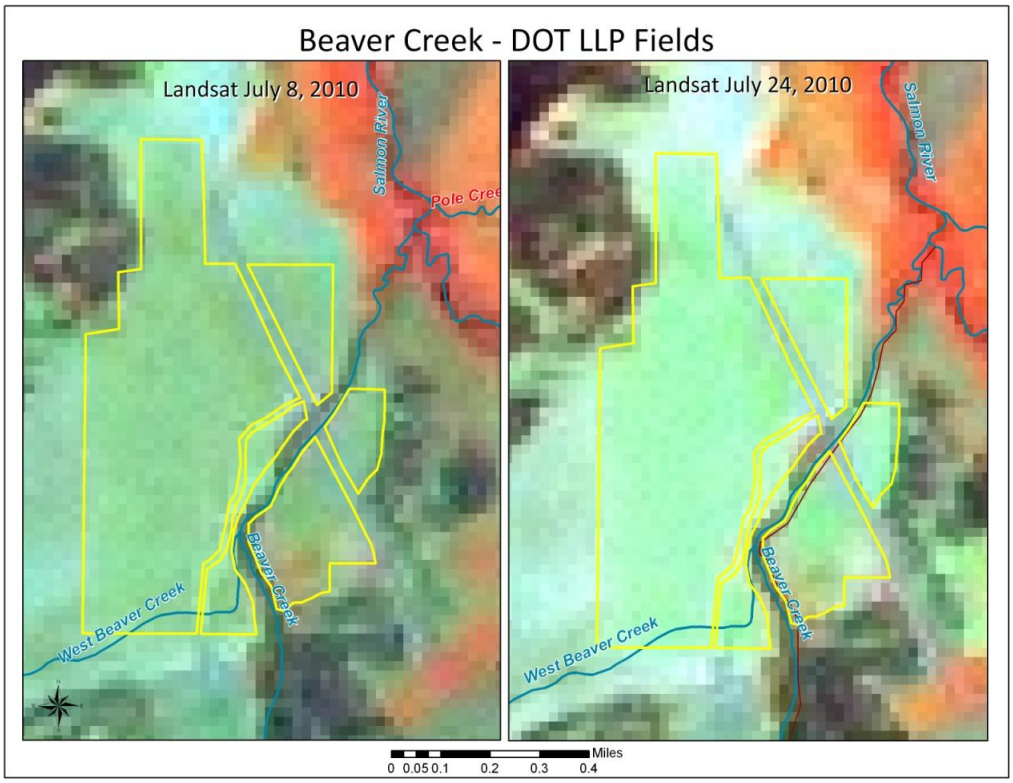

Figure 7. Landsat satellite imagery of the Alturas Lake Creek leased fields. Red indicates high evapo-transpiration rates.

Figure 8. Beaver Creek above highway April 4, 2004 and July 3, 2010. Note improvement in riparian vegetation.

Figure 9. Beaver Creek below highway April 4, 2004 and July 3, 2010. Note improvement in riparian vegetation.

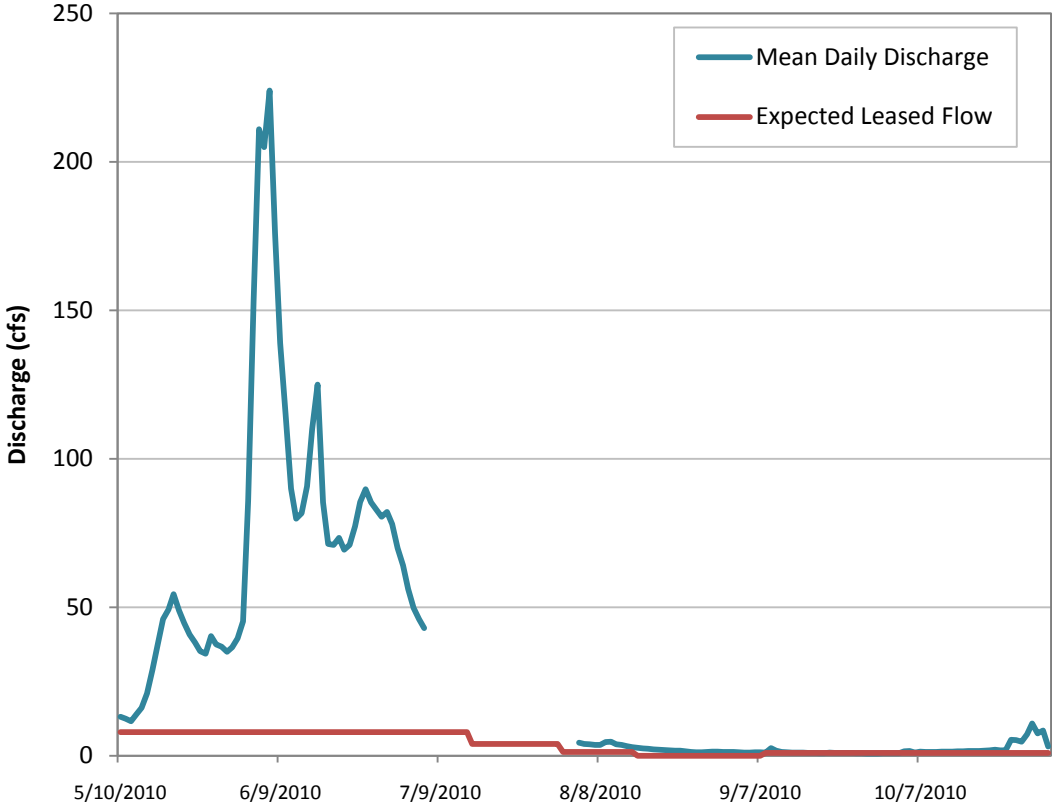

Figure 10. Beaver Creek mean daily flow at Highway 93, May 10 to October 31.

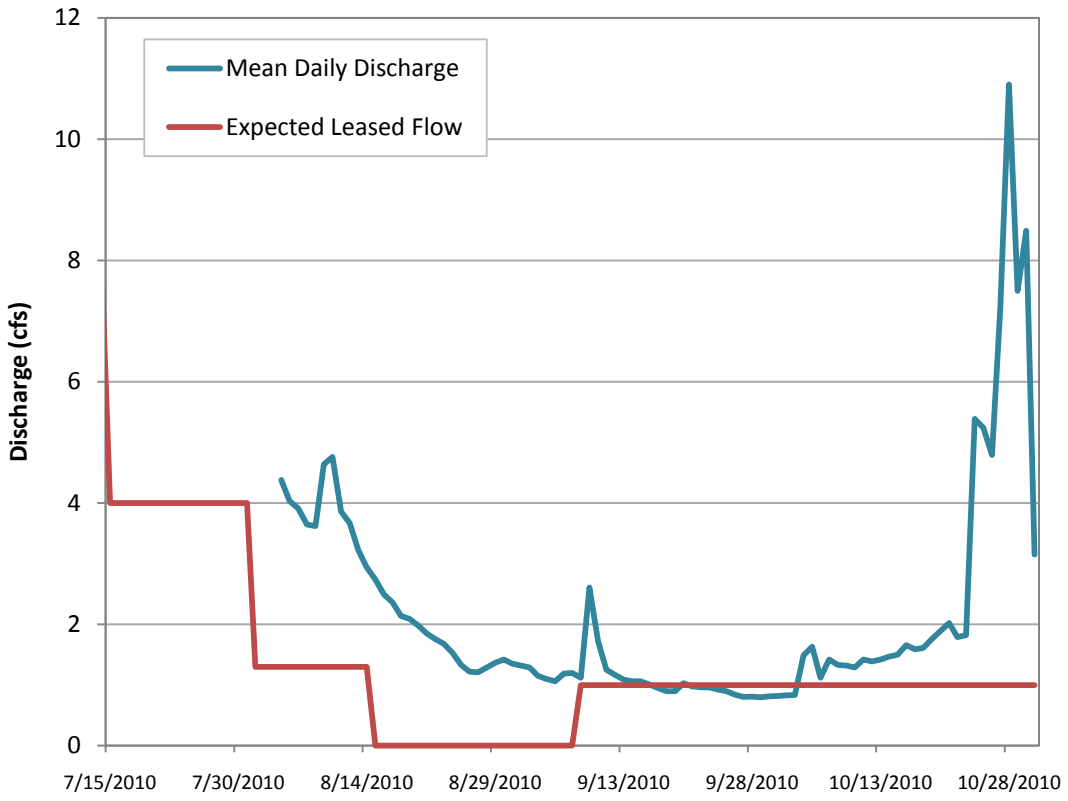

Figure 11. Beaver Creek mean daily flow at Highway 93, July 15 to October 31.

Idaho Department of Fish and Game (IDFG) conducted Chinook salmon redd surveys in 2010 and found 52 Chinook salmon redds in the Salmon River within 8 miles of the mouth of Beaver Creek.

Physical Habitat Simulation (PHABSIM) results from a study on Beaver Creek (Maret et al. 2005) were used to develop habitat availability with and without the 8.77 cfs of leased water. Figures 12-14 represent the percentage of usable area for each species of concern. Juvenile habitat is not included due to limitations of the PHABSIM model.

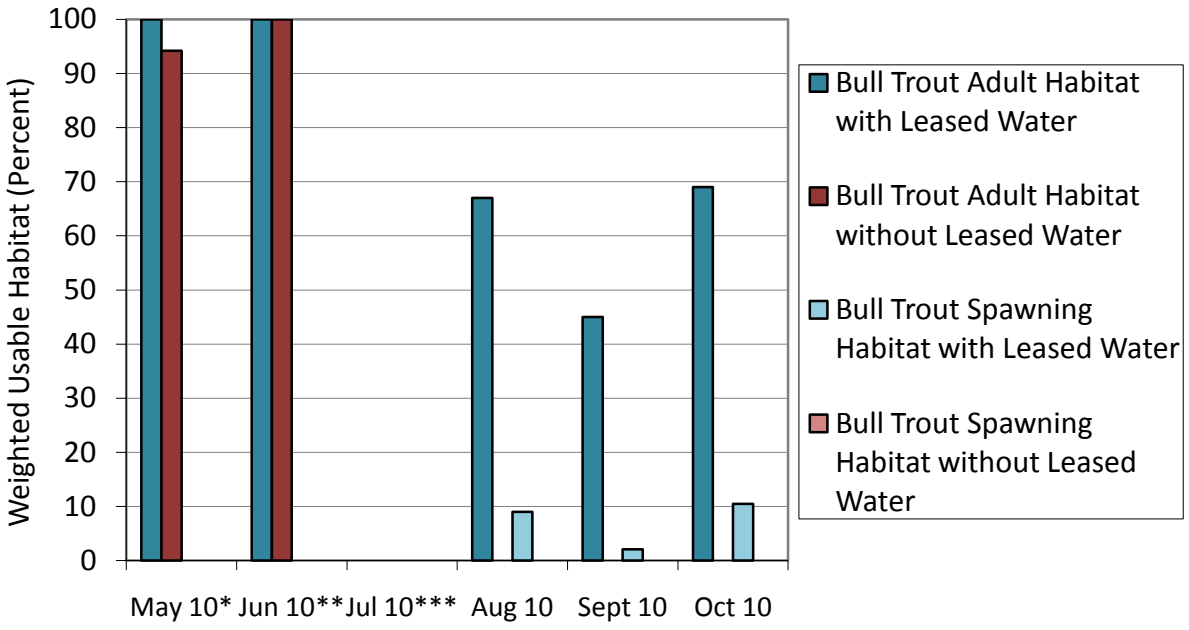

Figure 12. Percent usable habitat for adult and spawning bull trout at mean monthly flows in 2010, including and excluding the leased 8.77 cfs. *Flows in May were beyond the modeled range for the habitat with leased water. **Flows in June were beyond the modeled range. ***July was not included due to limited gage data.

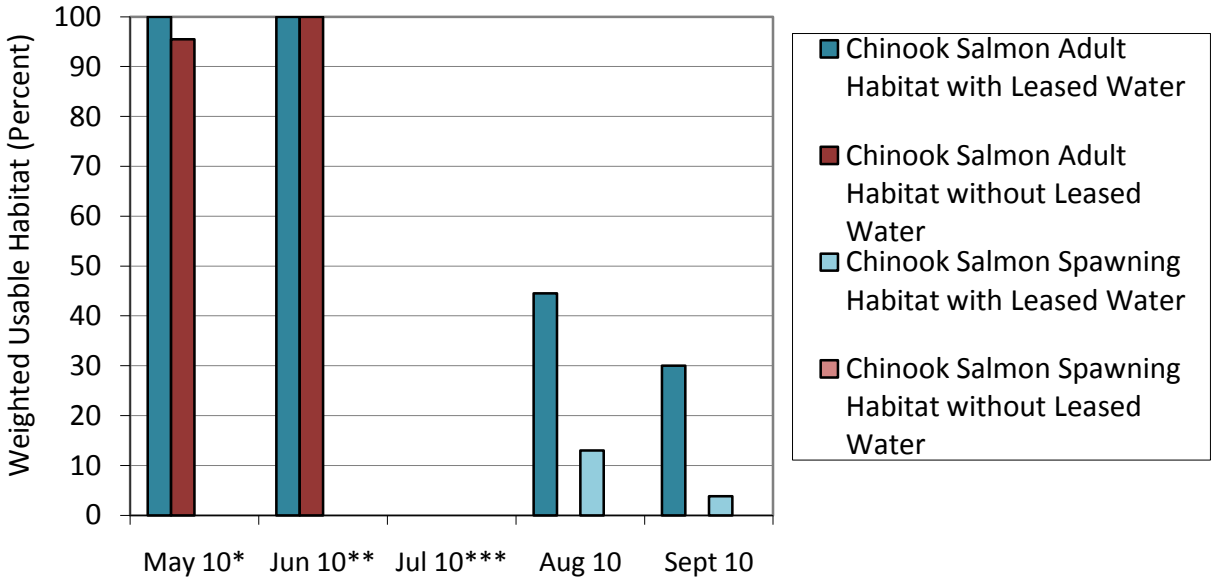

Figure 13. Percent usable habitat for adult and spawning Chinook salmon at mean monthly flows in 2010, including and excluding the leased 8.77 cfs. *Flows in May were beyond the modeled range for the habitat with leased water. **Flows in June were beyond the modeled range. ***July was not included due to limited gage data.

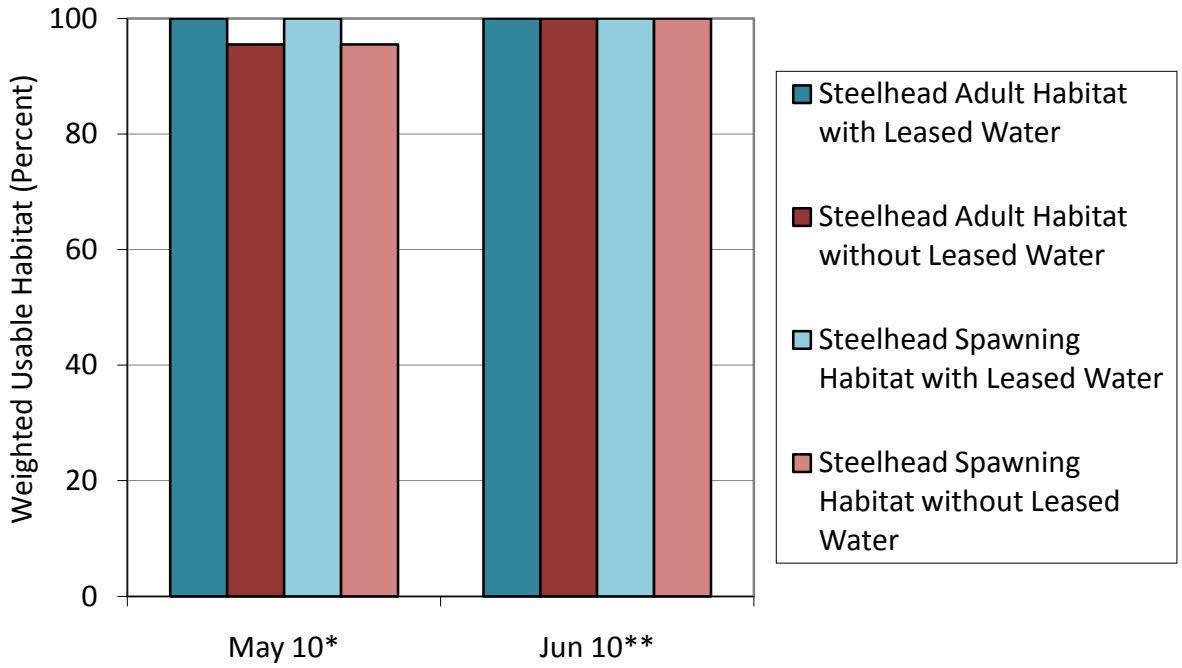

Figure 14. Percent usable habitat for adult and spawning steelhead at mean monthly flows in 2010, including and excluding the leased 8.77 cfs. *Flows in May were beyond the modeled range for the habitat with leased water. **Flows in June were beyond the modeled range.

Fourth of July Creek – Stanley Basin

The Idaho Water Resource Board negotiated a 20-year lease to place 2.9 cfs (formerly irrigating 43.1 acres) into the Water Supply Bank. The water was leased from May 1 to Oct. 31. Approximately 2.0 miles of lower Fourth of July Creek were reconnected to the Salmon River, providing fluvial bull trout access to the upper reaches.

A site visit to Fourth of July Creek on 7/3/2010 confirmed that the landowners were complying with the terms of the lease. A gage in Fourth of July Creek monitored flow in the river during the irrigation season (Figure 15). The leased water provided a reconnect to the Salmon River throughout the irrigation season for juvenile salmon, steelhead and bull trout.

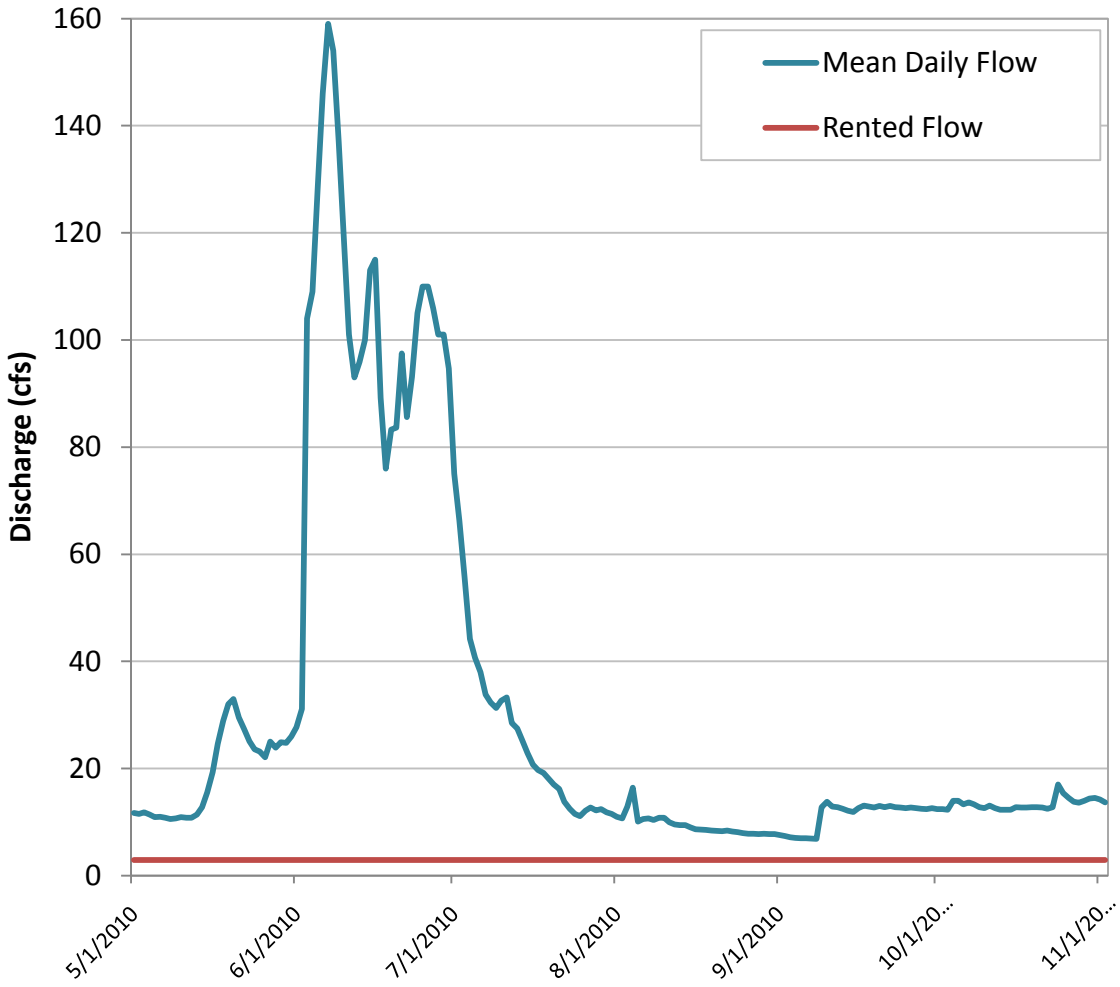

Figure 15. Fourth of July Creek mean daily flow at Highway 93, May 1 to October 31.

Physical Habitat Simulation (PHABSIM) results from a study on Fourth of July Creek (Maret et al. 2005) were used to develop habitat availability with and without the 2.9 cfs of leased water. Figures 16-18 represent the percentage of usable area for each species of concern. Juvenile habitat is not included due to limitations of the PHABSIM model.

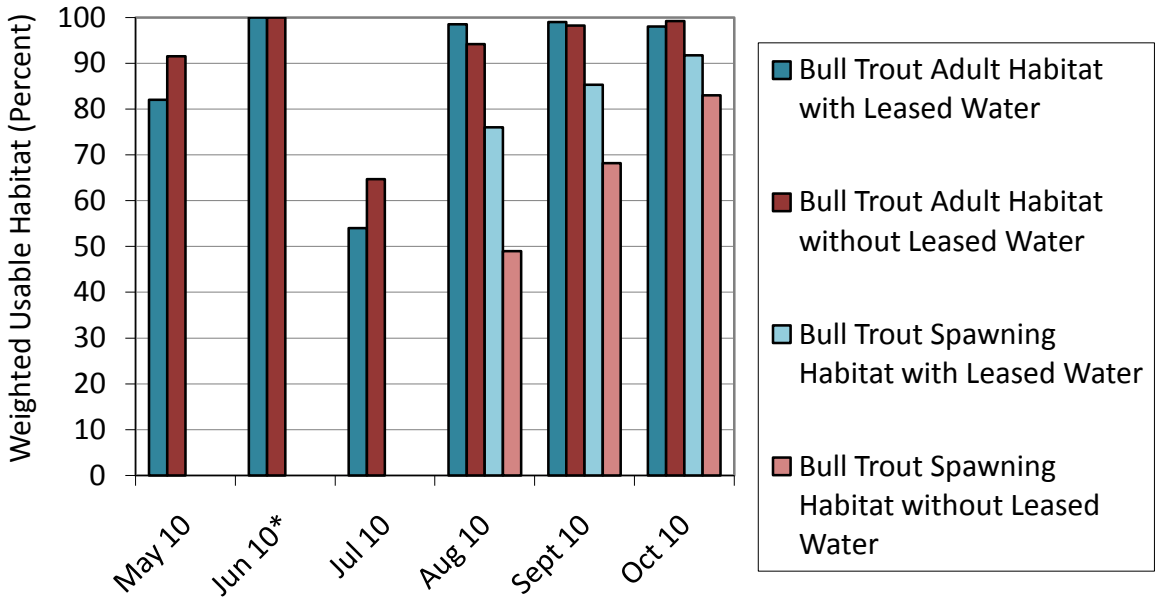

Figure 16. Percent weighted usable habitat for adult and spawning bull trout at mean monthly flows in 2010, including and excluding the leased 2.9 cfs. * Flows in June were beyond the modeled range.

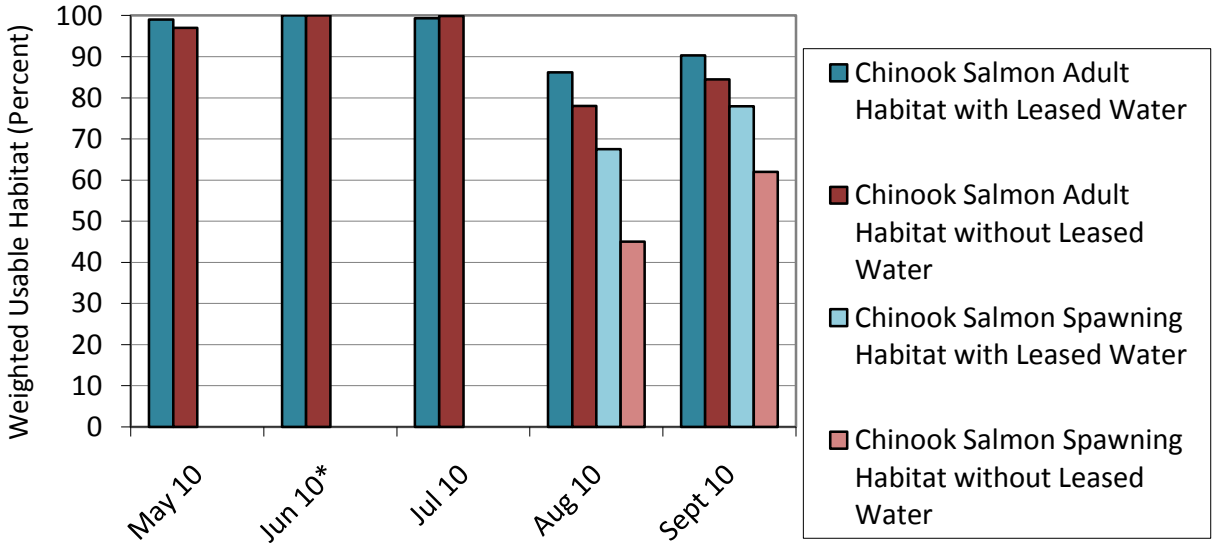

Figure 17. Percent weighted usable habitat for adult and spawning Chinook salmon at mean monthly flows in 2010, including and excluding the leased 2.9 cfs. * Flows in June were beyond the modeled range.

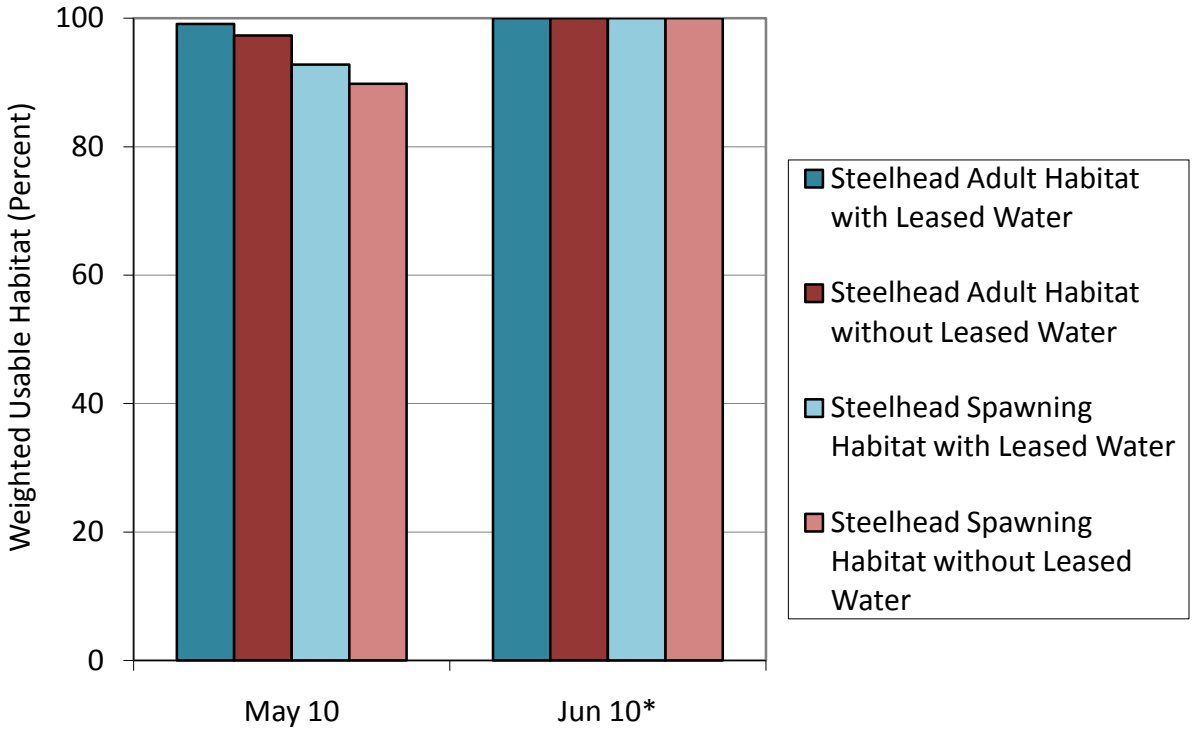

Figure 18. Percent weighted usable habitat for adult and spawning steelhead at mean monthly flows in 2010, including and excluding the leased 2.9 cfs. * Flows in June were beyond the modeled range.

Idaho Department of Fish and Game has been conducting bull trout redd counts in Fourth of July Creek since 2003 (Curet 2011). They show a marked increase in the total number of redds every year between 2003 and 2006 (Figure 19). There were declines in 2007 and 2008, which may be due to the effects of the 2005 fire in the basin. There were 56 bull trout redd counted in Fourth of July Creek in 2010. This may be an underestimate due to inclement weather (major snowstorm) during the count.

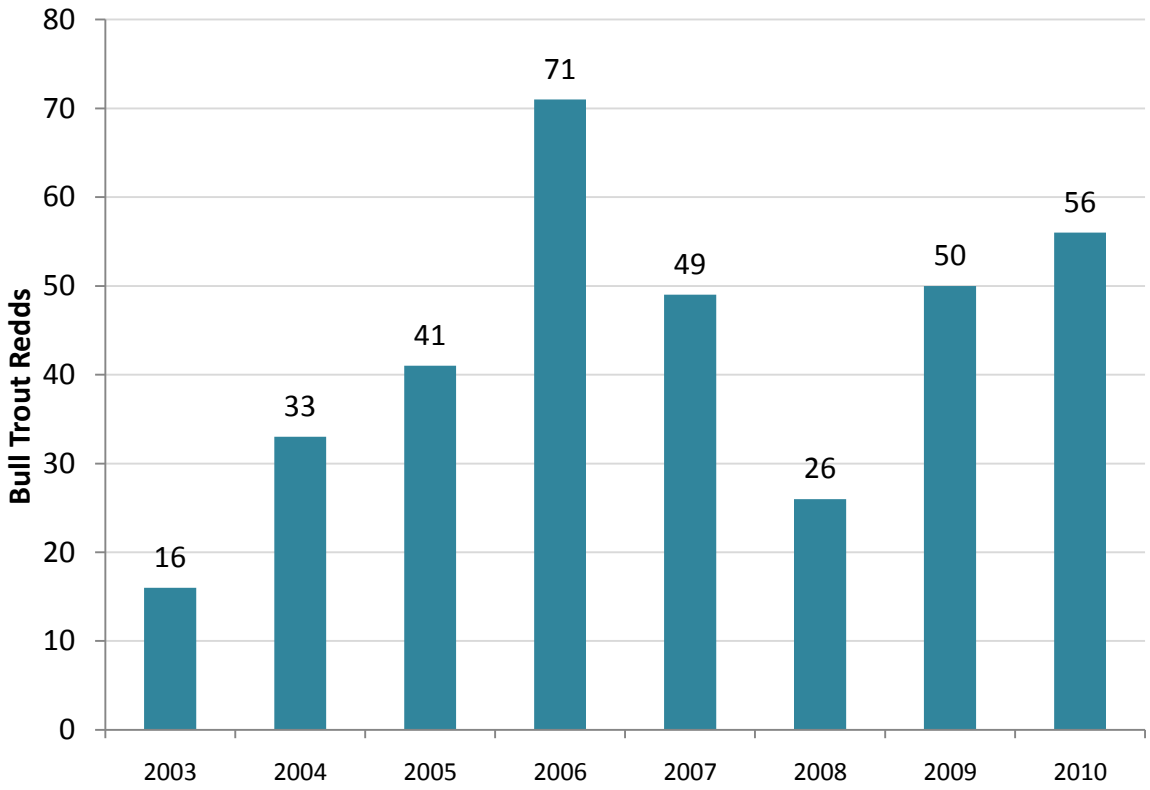

Figure 19. Annual counts of fluvial bull trout redds in Fourth of July Creek from 2003-2010 (Curet 2010).

A logger placed at the mouth of Fourth of July Creek, recorded water temperature every 2 hours between June 3, 2010 and October 5, 2010 (Figure 20).

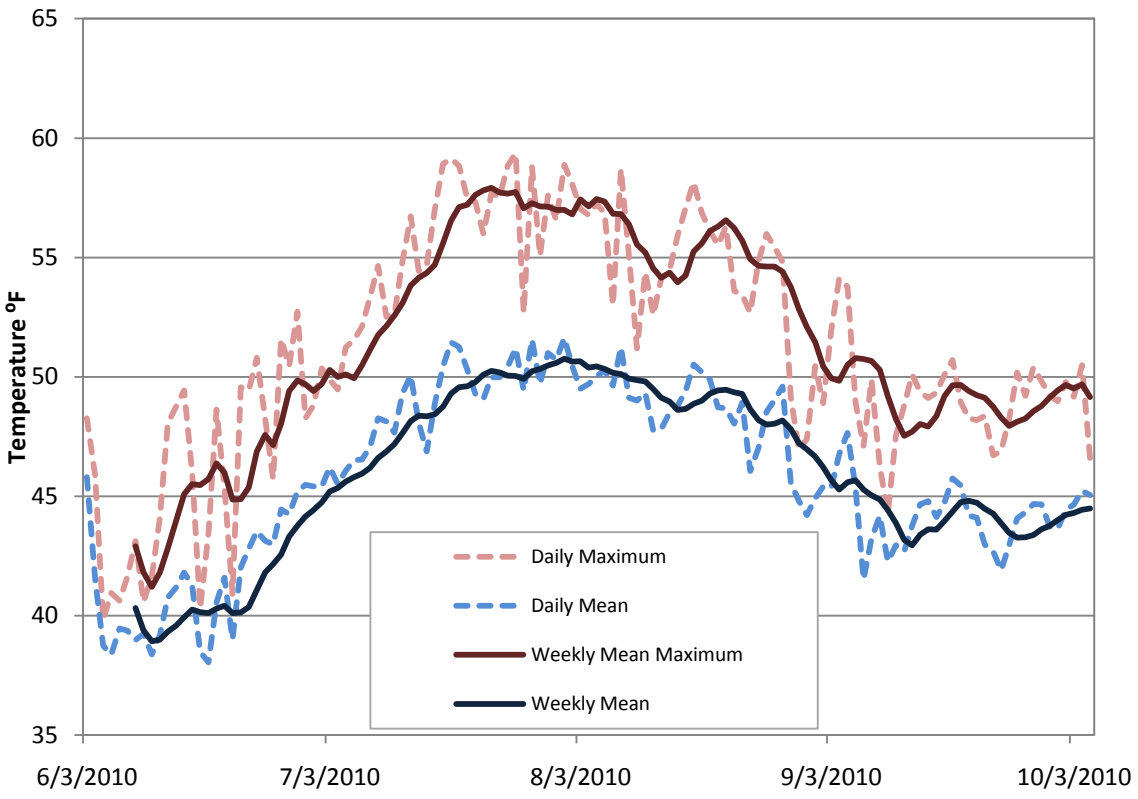

Figure 20. Fourth of July Creek (near mouth) water temperature data (°F) as collected by HOBO Tidbit logger measuring every two hours from June 3 – October 5, 2010.

Pole Creek – Stanley Basin

The Pole Creek project is not a traditional lease that dries up irrigated fields. Salmon Falls Sheep Company holds several water rights from Pole Creek. One of these is a hydropower right for 7 cfs that is used to generate power to operate pivots. This diversion, along with irrigation water rights has the ability to drop flows low enough to impede fish migration, raise temperatures, and reduce available fish habitat. In order prevent the reduction of flow below 5 cfs, IWRB and Salmon Falls Sheep Company initiated minimum flow agreement. In exchange for leaving at least 5 cfs of the hydropower right in Pole Creek during the irrigation season, the landowner is paid the operating cost of a generator to run his pivots. In 2006, IDWR developed a five-year agreement not to divert that supply the landowner with a generator and the funds for fuel.

A site visit to Pole Creek on 7/3/2010 confirmed that the landowner was complying with the terms of the agreement. A gage in Pole Creek monitored flow in the river during the irrigation season (Figure 21). There were several temporary periods of flow below 5 cfs. Improved communication about gage shifts will prevent this from occurring in future years. In 2010, higher flows in Pole Creek allowed the landowner to divert his hydropower right for the full irrigation season.

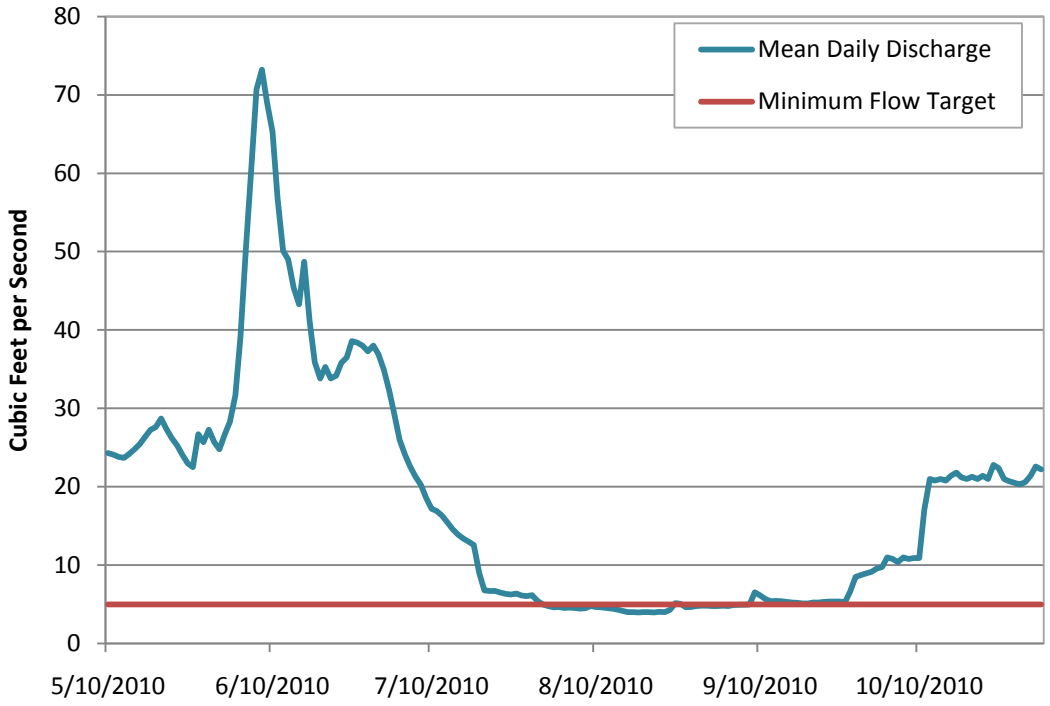

Figure 21. Pole Creek mean daily flow, May 1 to October 31.

Idaho Department of Fish and Game (IDFG) conducted Chinook salmon redd surveys in 2010 and found 2 redds in Pole Creek, one in the primary reach and one below the primary reach. A logger placed in Pole Creek, recorded water temperature every 2 hours between June 2, 2010 and October 5, 2010 (Figure 22).

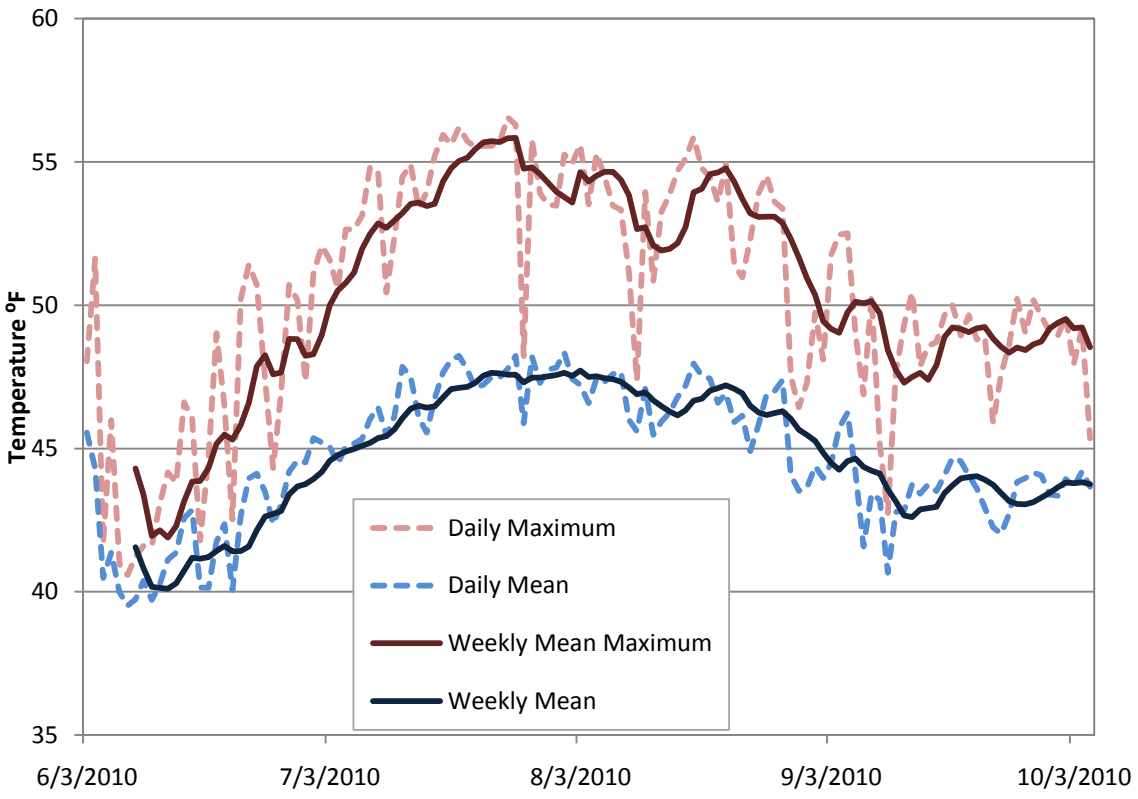

Figure 22. Pole Creek (below fish screen return pipe) water temperature data (^{o}F) as collected by HOBO Tidbit logger measuring every two hours from June 3 – October 5, 2010.

Big Hat Creek – Mainstem Salmon River Basin (Valley Creek-Pahsimeroi River)

Erik Storlie and Tamara Kaiser donated 1.23 cfs, formerly irrigating 43.6 acres to the IWRB for rental to the minimum stream flow at the mouth of Hat Creek. The water was leased from April 1 to Oct. 31. Approximately 3.4 miles of lower Big Hat Creek was reconnected to Hat Creek. This provided resident bull trout access to the upper reaches of Big Hat Creek.

Landsat images confirmed the leased water was not being used to irrigate land (Figure 23). The gage on Big Hat Creek was transferred to Iron Creek, due to a lack of funds for an additional gage, and the respective importance of the Iron Creek transaction. This Big Hat transaction removes the only diversion on Big Hat Creek, returning the stream to a natural flow. With occasional site visits and Landsat verification, IDWR is confident that stream flows in Big Hat Creek obtain the biological objective of reconnecting Big Hat Creek for threatened bull trout.

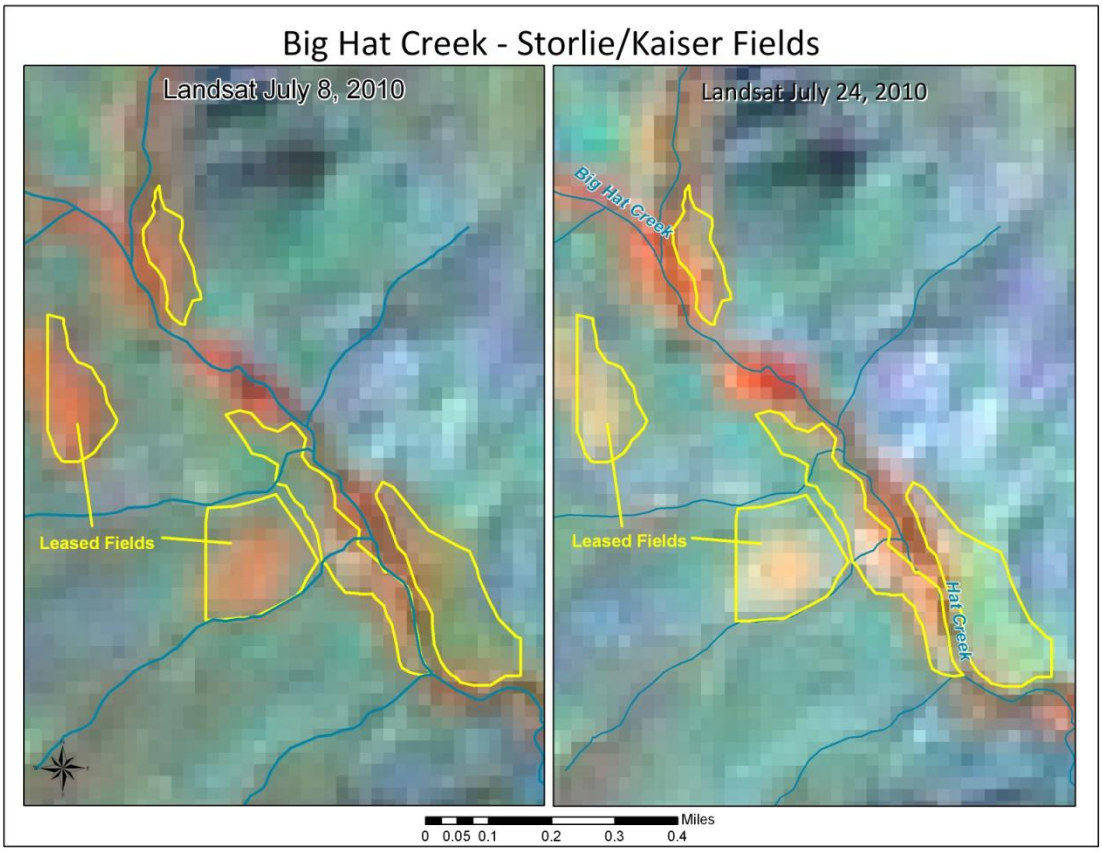

Figure 23. Landsat satellite imagery of the Big Hat Creek leased fields. Red indicates high evapo-transpiration rates.

There has been no PHABSIM modeling of Big Hat Creek. A logger placed in Big Hat Creek by the USFS recorded water temperature every hour between July 1, 2010 and October 12, 2010 (Figure 24).

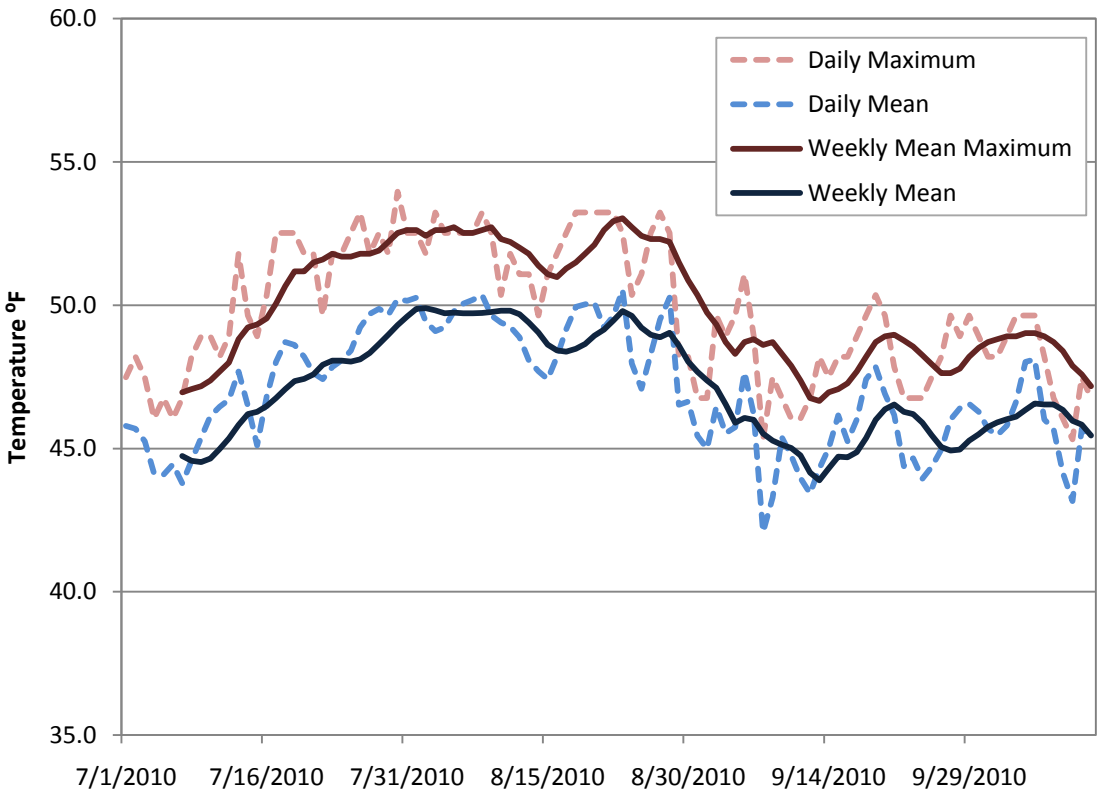

Figure 24. Big Hat Creek (below Storlie/Kaiser diversion) water temperature data (°F) as collected by HOBO Tidbit logger measuring every hour from July 1 to October 12, 2010.

Morgan Creek – Mainstem Salmon River Basin (Valley Creek-Pahsimeroi River)

In 2009, IDWR developed two five-year agreements not to divert from Morgan Creek. The agreements provide a minimum flow of 2 cfs in the lower end of Morgan Creek, which would normally run dry. The irrigators agreed to pump water out of a Salmon River ditch instead of drying up Morgan Creek, whenever flows approached 2 cfs. This flow provides a partial reconnection to important spawning and rearing habitat for Chinook salmon and steelhead.

A site visits to Morgan Creek on 8/31/2010 confirmed that the landowners were complying with the terms of the agreement. A new gage in Morgan Creek, maintained by Idaho Power, monitored flow in the river during the irrigation season (Figure 25). While the gage showed a 2 week period of flow below 2 cfs, a site visit during that period revealed a possible issue with the rating curve at the lower flows. Photos of the Morgan Creek on August 31, 2010, when the gage record showed a discharge of zero flow, revealed a much higher rate (Figures 26-27). A logger placed in Morgan Creek, recorded water temperature every 2 hours between July 9, 2010 and October 5, 2010 (Figure 28). Temperatures dropped several degrees during the period that the gage reflected a zero flow. This provides further evidence that the gage readings were not accurately measuring flow in Morgan Creek.

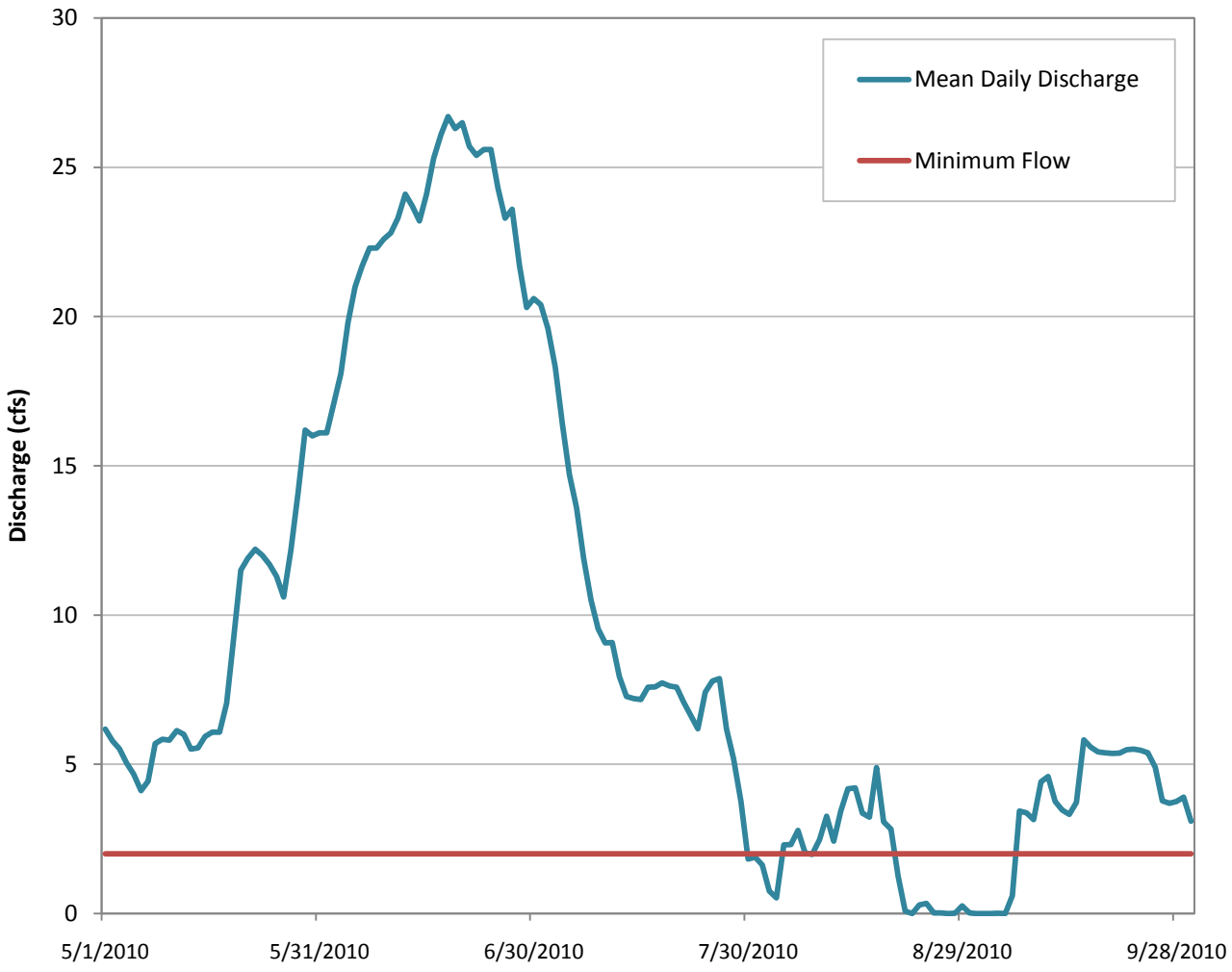

Figure 25. Morgan Creek mean daily flow below Highway 93, July 15 to October 31, 2010.

Figure 26. Morgan Creek upstream of Jones' bridge on August 31, 2010 when the Idaho Power gage reflected a zero flow.

Figure 27. Morgan Creek downstream of Jones' bridge on August 31, 2010 when the Idaho Power gage reflected a zero flow.

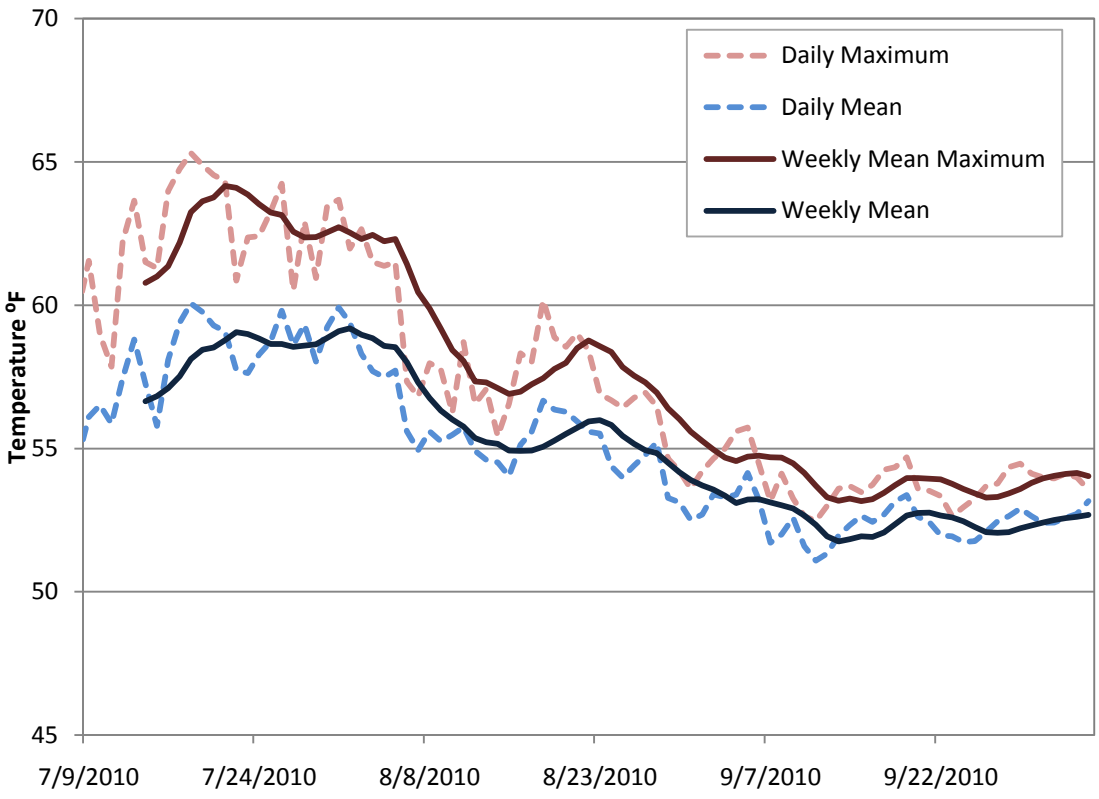

Figure 28. Morgan Creek (at Jones' bridge) water temperature data (°F) as collected by HOBO Tidbit logger measuring every two hours from July 9 – October 5, 2010.

Pahsimeroi P-9 Projects – Pahsimeroi River Basin

The Pahsimeroi P-9 project consists of a set of four 20-year agreements not to divert. The goal of the P-9 ditch removal project was to remove the P-9 ditch and its associated cross ditch. The cross ditch intercepted flows from two spring creeks and transported the flow across an alkali flat. The cross ditch dumped into the Pahsimeroi River and was then picked up by the P-9 ditch. The P-9 ditch intercepted another spring creek and could cause passage problems at the diversion due to low flows. The project leaves almost 30 cfs in the Pahsimeroi River at P-9, Mud Springs Creek, Patterson/Big Springs Creek, and Duck Springs (distribution of that flow is not well defined). The water is now pumped out of the Pahsimeroi River lower in the system, where flow is not limited.

A site visit on 9/2/2010 confirmed that the landowners were complying with the terms of the agreement. Several gages in the project area monitored flows during the irrigation season. The Pahsimeroi River gage below the P-9 ditch monitored flows during the irrigation season (Figure 29). The Pahsimeroi River maintained a base flow of approximately 7 cfs in 2010, compared to previous years when flow dropped to almost zero intermittently. A gage on Patterson-Big Springs monitored flows above the old cross ditch (Figure 30).

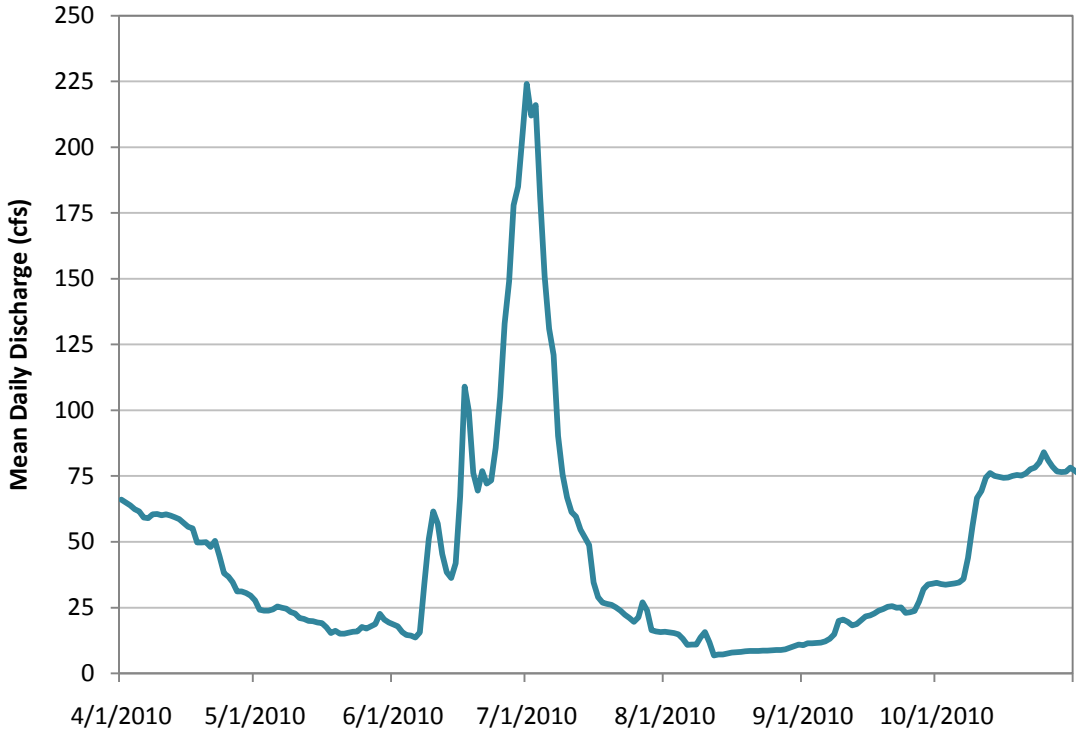

Figure 29. Pahsimeroi River mean daily flow below the P-9 ditch, April 1 to October 31.

Figure 30. Patterson Big Springs mean daily flow above old cross ditch, April 1 to October 31.

IDFG conducted Chinook salmon redd counts in the Pahsimeroi Basin in 2010 and found 42 redds in Patterson Big Springs Creek above the P-9 cross ditch. Loggers placed in the Pahsimeroi River, Patterson Big Springs Creek, Muddy Springs Creek, and Duck Springs recorded water temperature every 2 hours between June 12, 2010 and October 29, 2010 (Figures 31-34.)

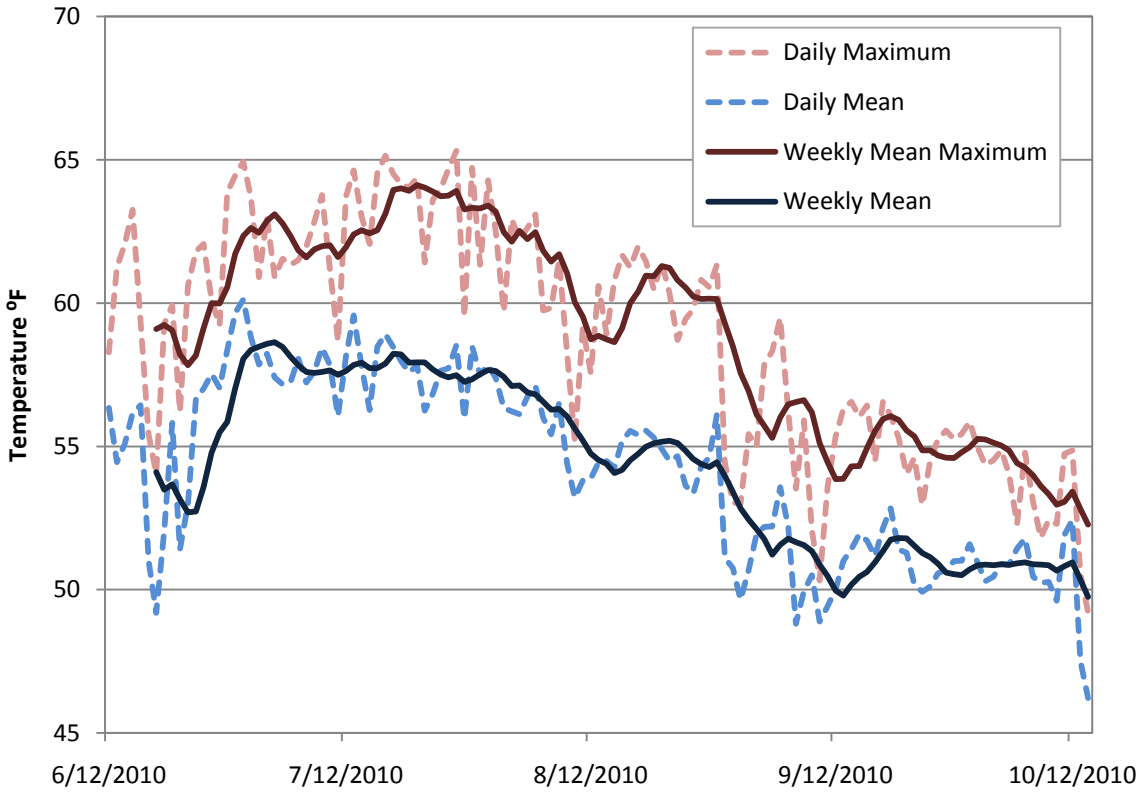

Figure 31. Pahsimeroi River (at P-9) water temperature data (°F) as collected by HOBO Tidbit logger measuring every two hours from June 12 – October 28, 2010.

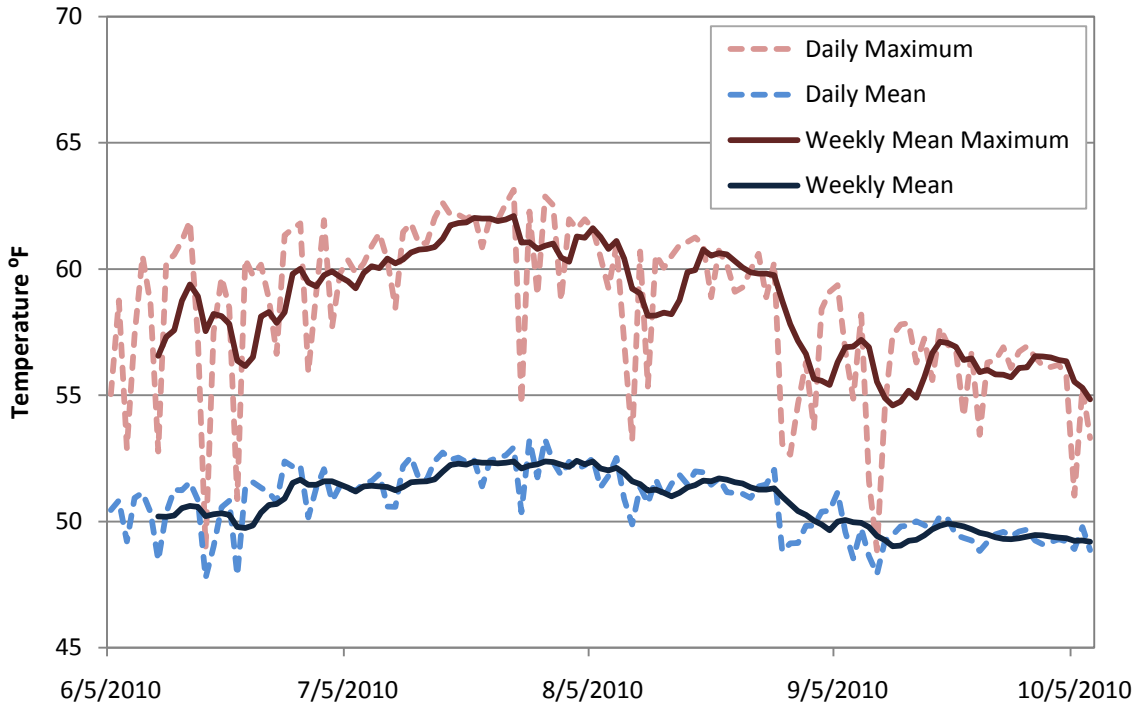

Figure 32. Patterson Big Springs Creek (below cross ditch) water temperature data (°F) as collected by HOBO Tidbit logger measuring every two hours from June 5 – October 28, 2010.

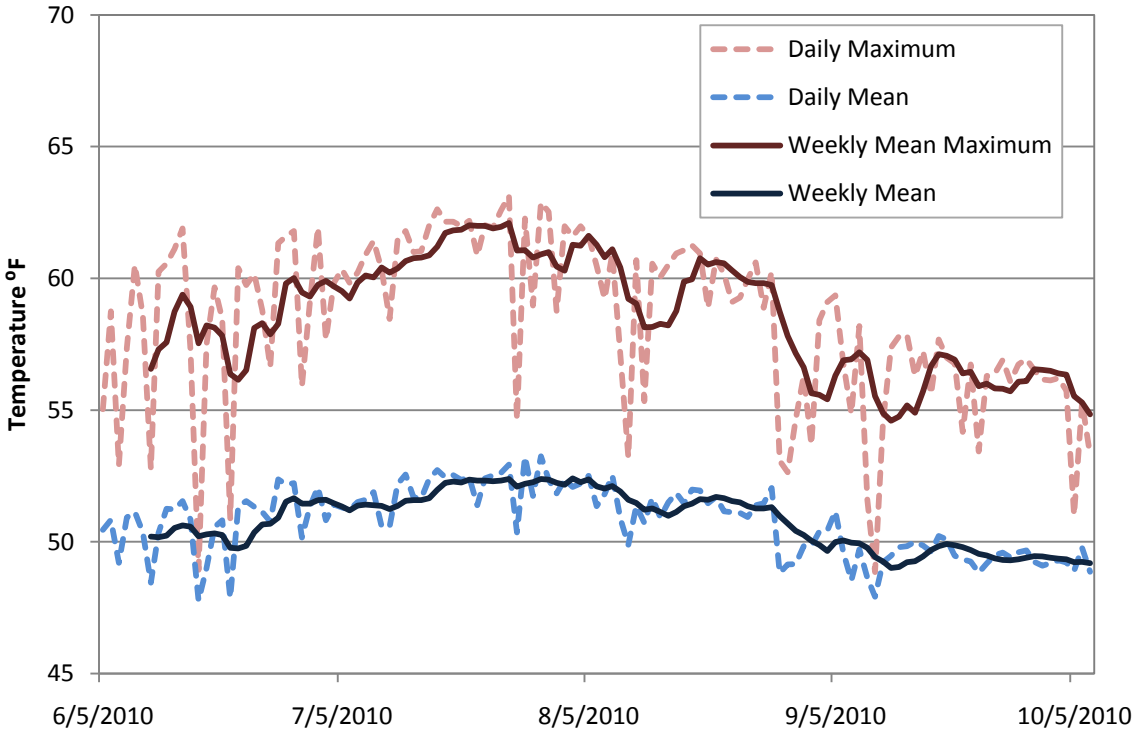

Figure 33. Muddy Springs Creek (lower) water temperature data (°F) as collected by HOBO Tidbit logger measuring every two hours from June 5 – October 28, 2010.

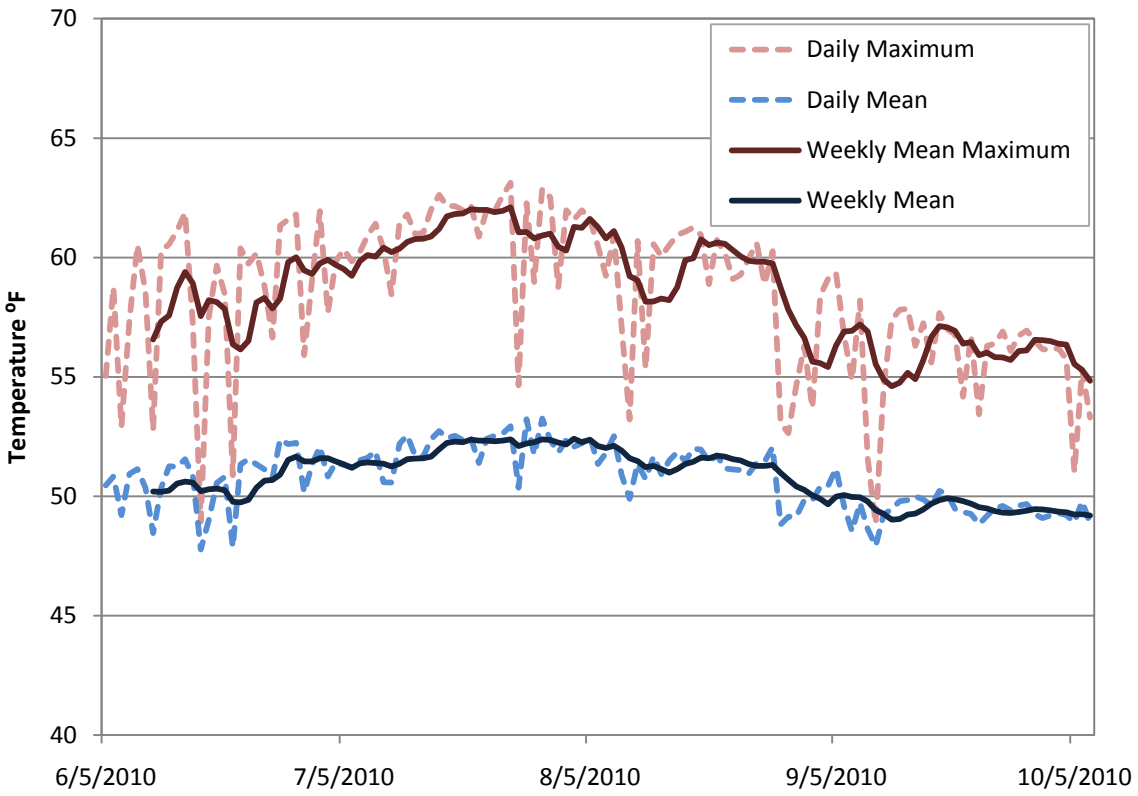

Figure 34. Duck Springs (below old cross ditch intercept) water temperature data (°F) as collected by HOBO Tidbit logger measuring every two hours from June 5 – October 28, 2010.

A 2009 restoration project on Duck Springs removed the cross ditch intercept which had blocked the flow of upper Duck Springs into Lower Duck Springs. Water from Duck Springs is no longer flowing down the remnant cross ditch, but flowing into lower Duck Springs (Figures 35-36).

Figure 35. Duck Springs at former cross ditch intercept September 1, 2009 and September 2, 2010

Figure 36. Duck Springs below former cross ditch intercept August 15, 2007 and September 2, 2010.

Iron Creek Phase II– Mainstem Salmon River Basin (Pahsimeroi River – Lemhi River)

The Iron Creek Phase II project is a twenty-year full-season agreement not to divert. Clyde and Janelle Phillips added a point of diversion on the Salmon River and agreed not to divert 7.08 cfs from Iron Creek, an USBWP SHIPUSS high priority stream. The water provides a reconnection to important spawning and rearing habitat for Chinook salmon and steelhead.

A site visit to Iron Creek on 8/6/2010 confirmed that the landowner was complying with the terms of the agreement. A gage in Iron Creek monitored flow in the river during the irrigation season (Figures 37 and 38). A logger placed in Iron Creek by IDFG, recorded water temperature every 2 hours between January 1, 2010 and September 25, 2010 (Figure 39).

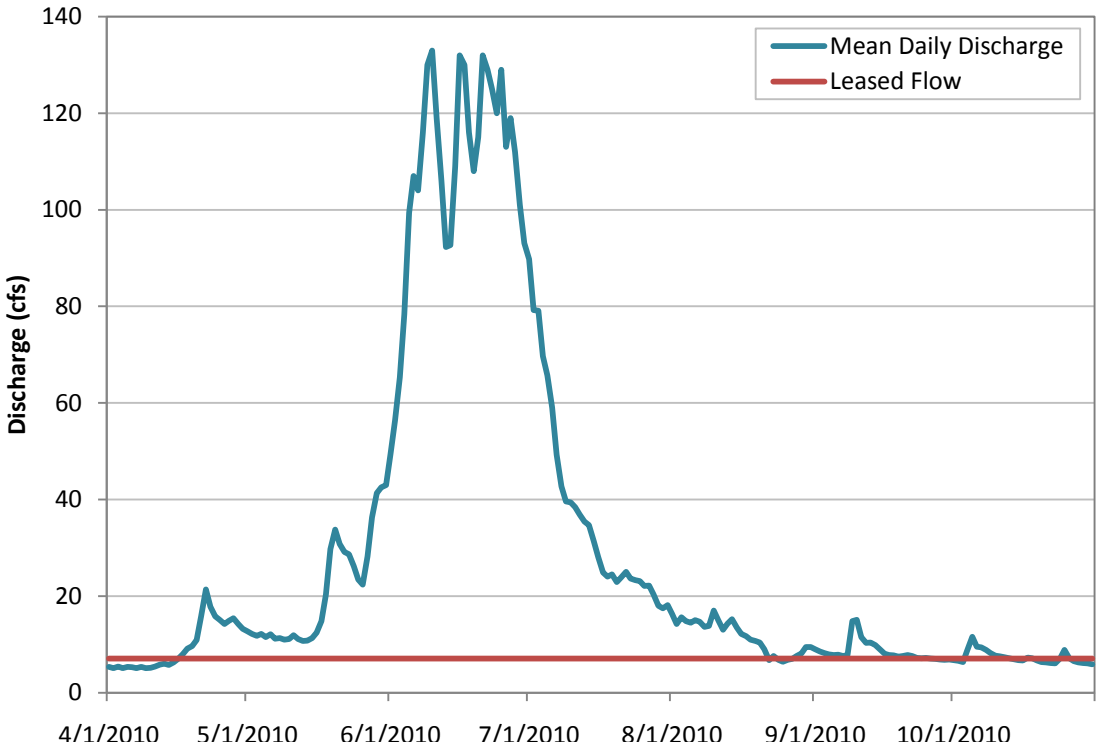

Figure 37. Iron Creek mean daily flow below Phillip's Bridge, April 1 to October 31.

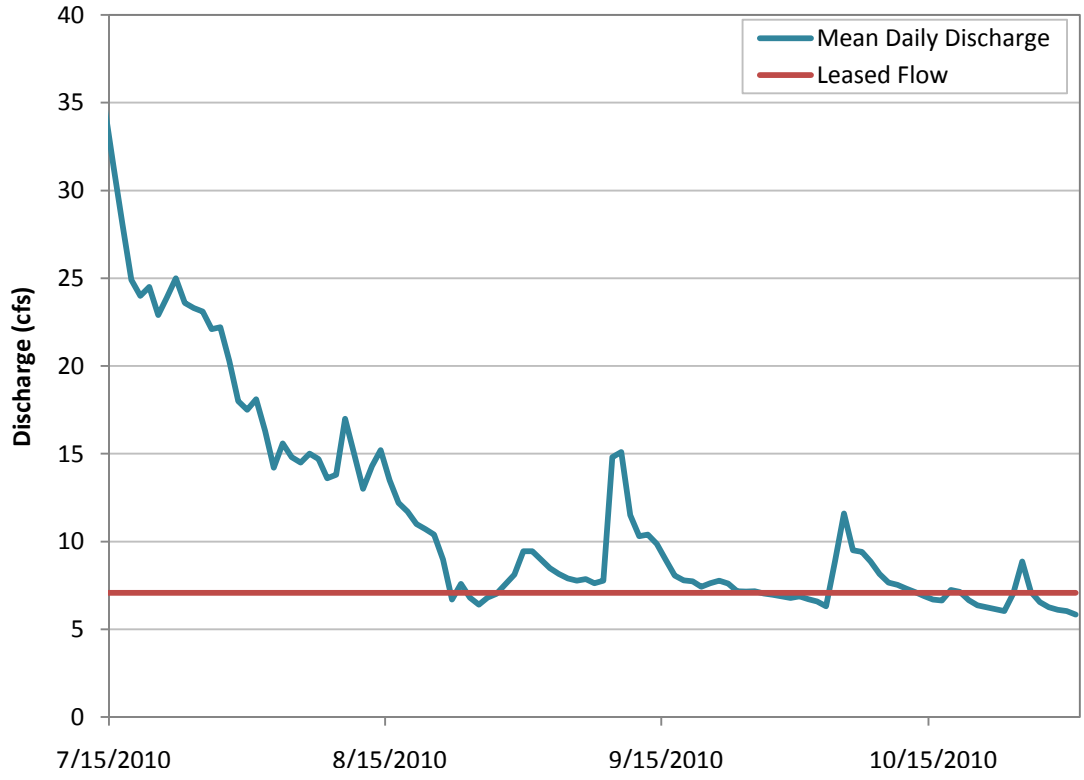

Figure 38. Iron Creek mean daily flow below Phillip's bridge, July 15 to October 31.

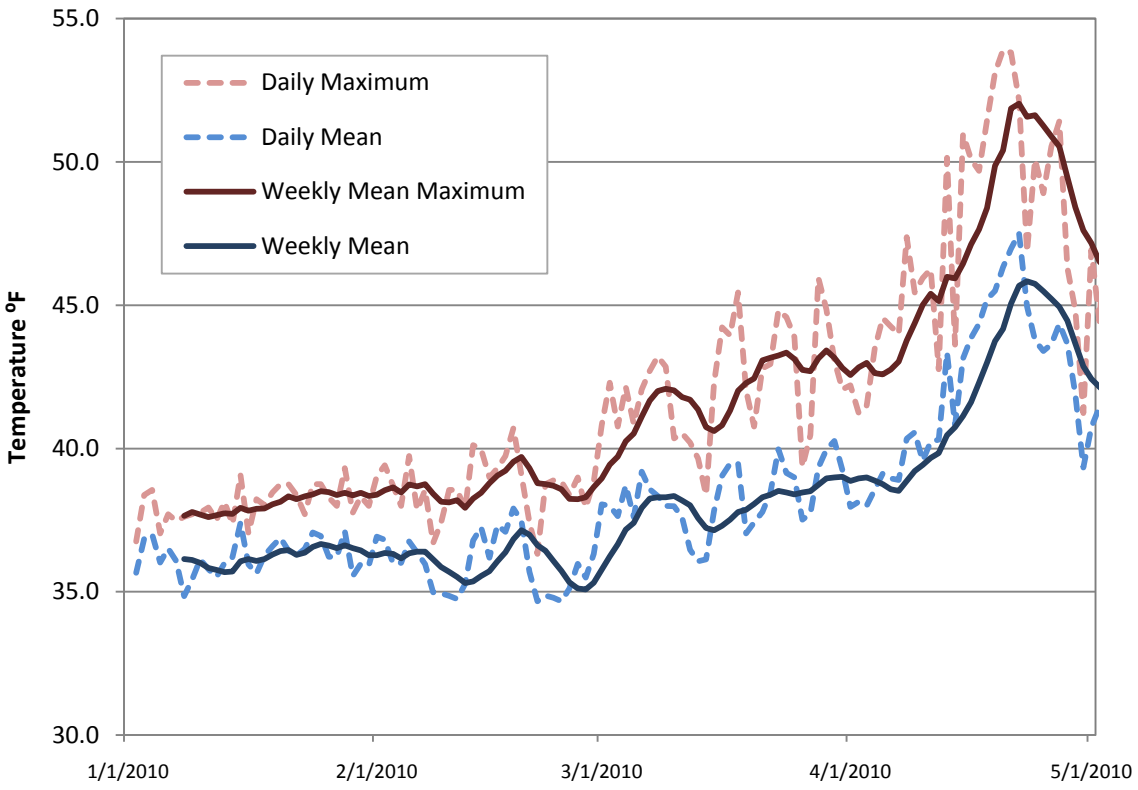

Figure 39. Iron Creek water temperature data (°F) as collected by HOBO Tidbit logger measuring every two hours from January 1 – September 25, 2010.

Lemhi River Agreement not to Divert - Lemhi River Basin

Through permanent conservation easements and annual agreements not to divert water at the L6 diversion with 14 landowners, in cooperation with Water District 74, water was acquired for 29 days to maintain up to 35 cfs from May 15 through November 15. The water provided passage flows necessary for in-migrating adult spring Chinook salmon and steelhead, and for out migrating salmon and steelhead smolts.

Rick Sager, the WD 74 Watermaster, administered this project. He adjusted the flows at L6 to meet the Lemhi Conservation Agreement flows (Figures 40-42). A revised protocol now requires manual measurements at the USGS as flows approach 42 cfs to prevent flows dropping below the targets due to gage shifts at the USGS Real Time Lemhi River gage.

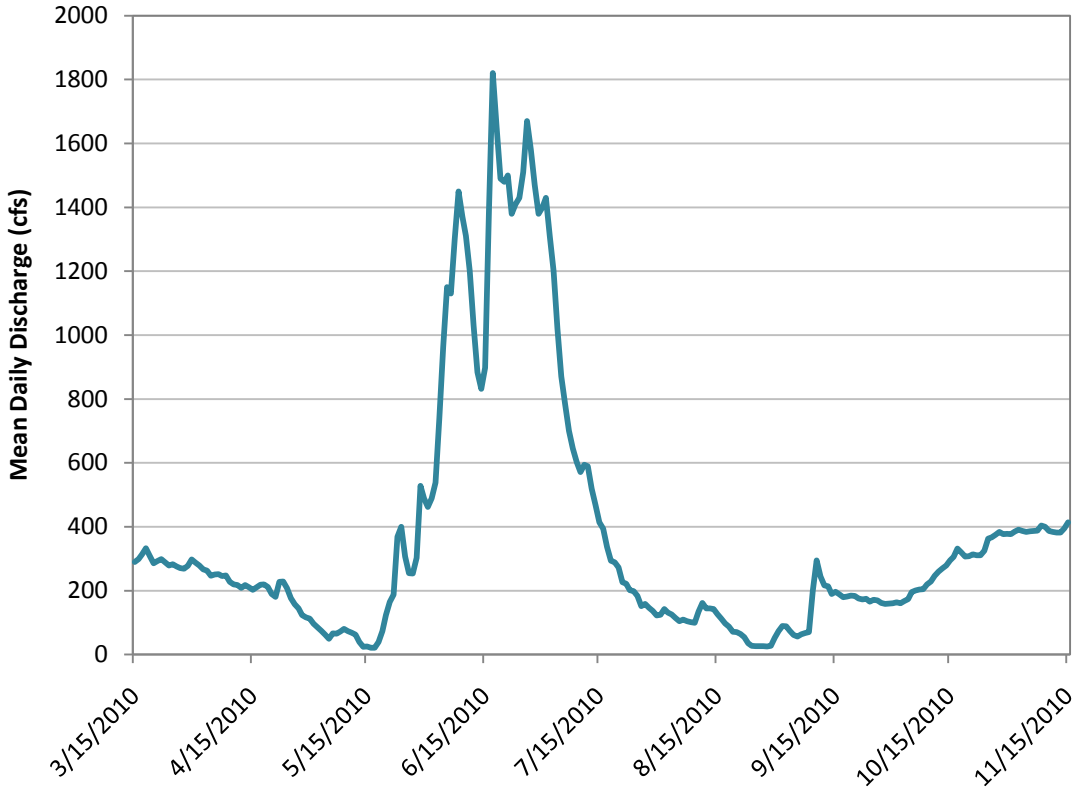

Figure 40. Lemhi River mean daily flow at L5, March 15 to November 15, 2010.

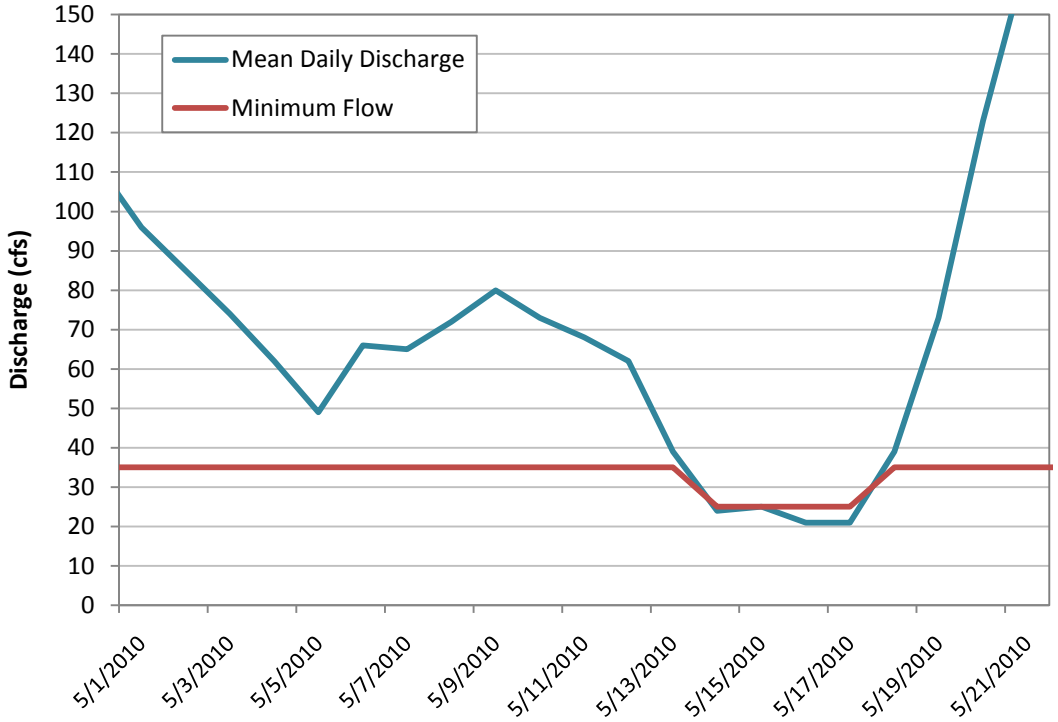

Figure 41. Lemhi River mean daily flow at L5, May 1-22, 2010 during the first period of regulation.

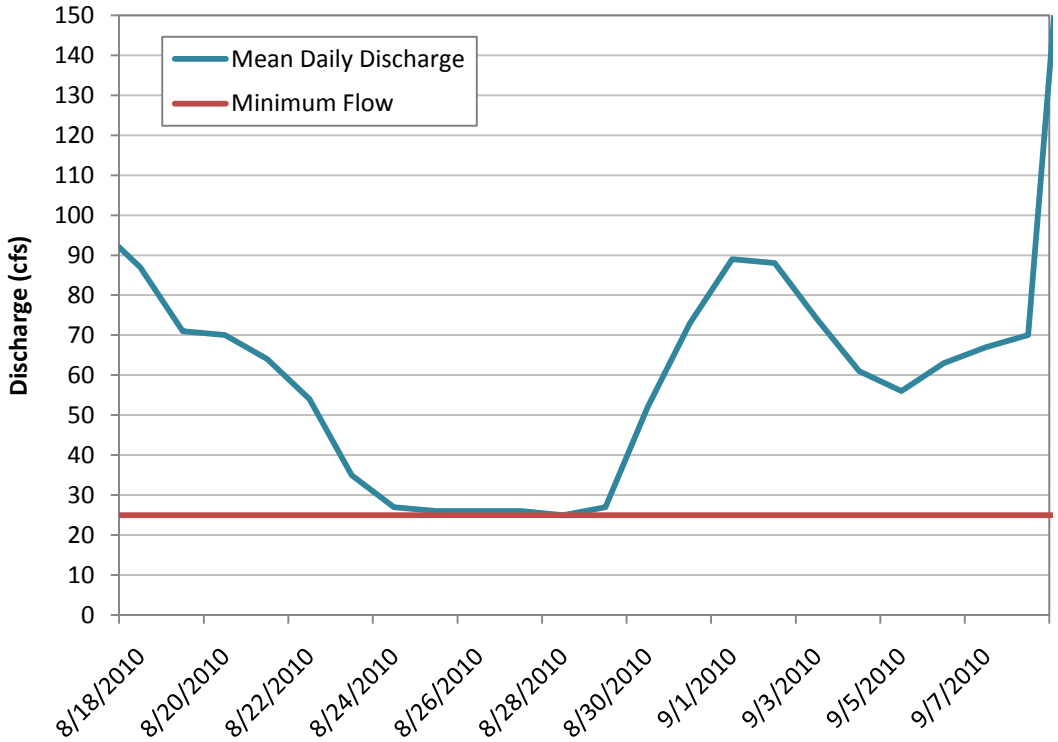

Figure 42. Lemhi River mean daily flow at L5, August 18 to September 8, 2010 during the second period of regulation.

IDFG conducted biologic monitoring in the Lemhi Basin in 2010 and found the 89 Chinook salmon redds in the Lemhi River (Figure 43). A screw trap in the lower Lemhi River also sampled juvenile fish (Figure 44).

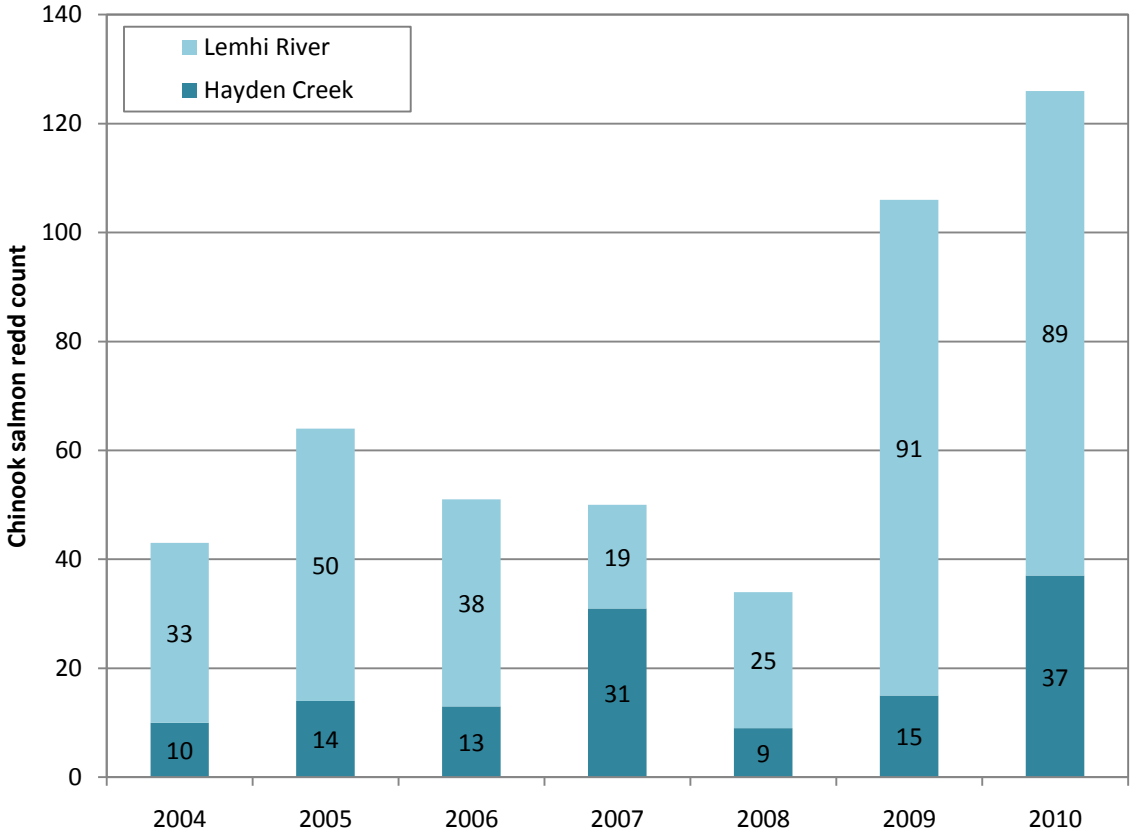

Figure 43. Lemhi River and Hayden Creek Chinook salmon redds 2004-2010 (Lutch 2006, Curet 2008, Biggs 2010, Biggs 2011).

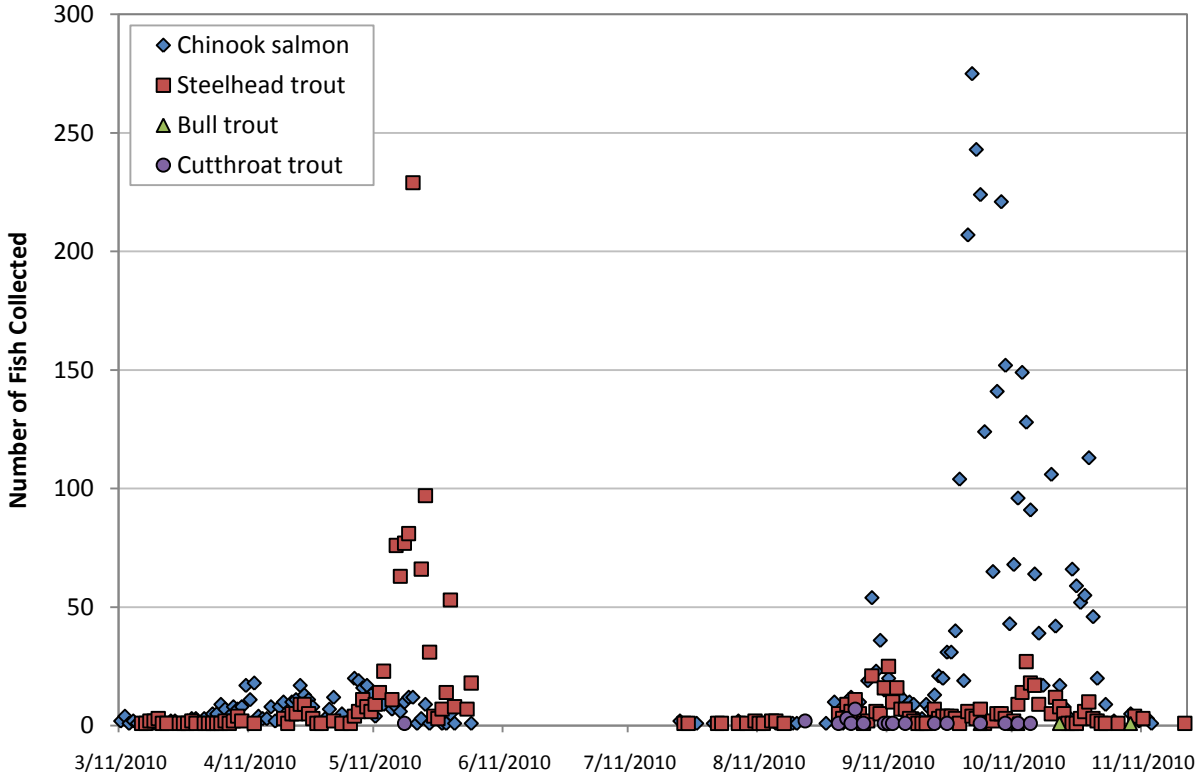

Figure 44. Lower Lemhi River screw trap data showing the number of bull trout, Chinook salmon, steelhead trout captured in 2010 (Biggs 2011).

Eighteenmile Creek – Upper Lemhi River Basin

The Eighteenmile Creek project is a ten-year partial season lease with the Ellsworth Angus Ranch providing 0.5 cfs, formerly irrigating 26 acres. 2010 was the sixth year of the transaction. The water was leased from June 1 to November 15. This lease eliminates the use of a ditch that crosses Hawley Creek, thus reconnecting Hawley Creek with Eighteenmile Creek, and the Lemhi River, when sufficient flows are present.

A gage downstream of the confluence with Hawley Creek monitored flow during the period of the Ellsworth lease (Figure 45). The minimum flow in Eighteenmile Creek was 7.88 cfs. Decent snow pack and a piping project on Hawley Creek most likely contributed to the relatively high flows. Landsat images confirmed that the landowner was complying with the terms of the lease (Figure 46).

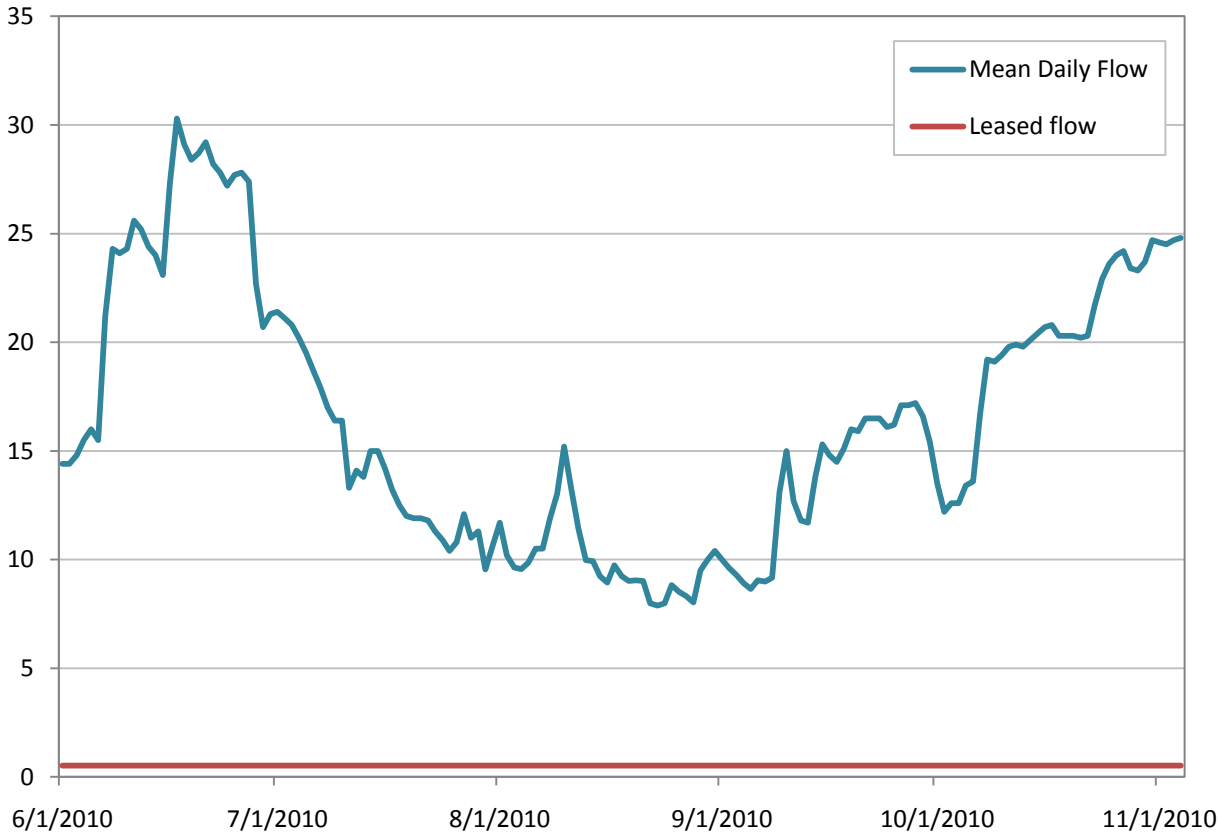

Figure 45. Eighteenmile Creek mean daily flow below the confluence with Hawley Creek June 1 to November 2, 2010.

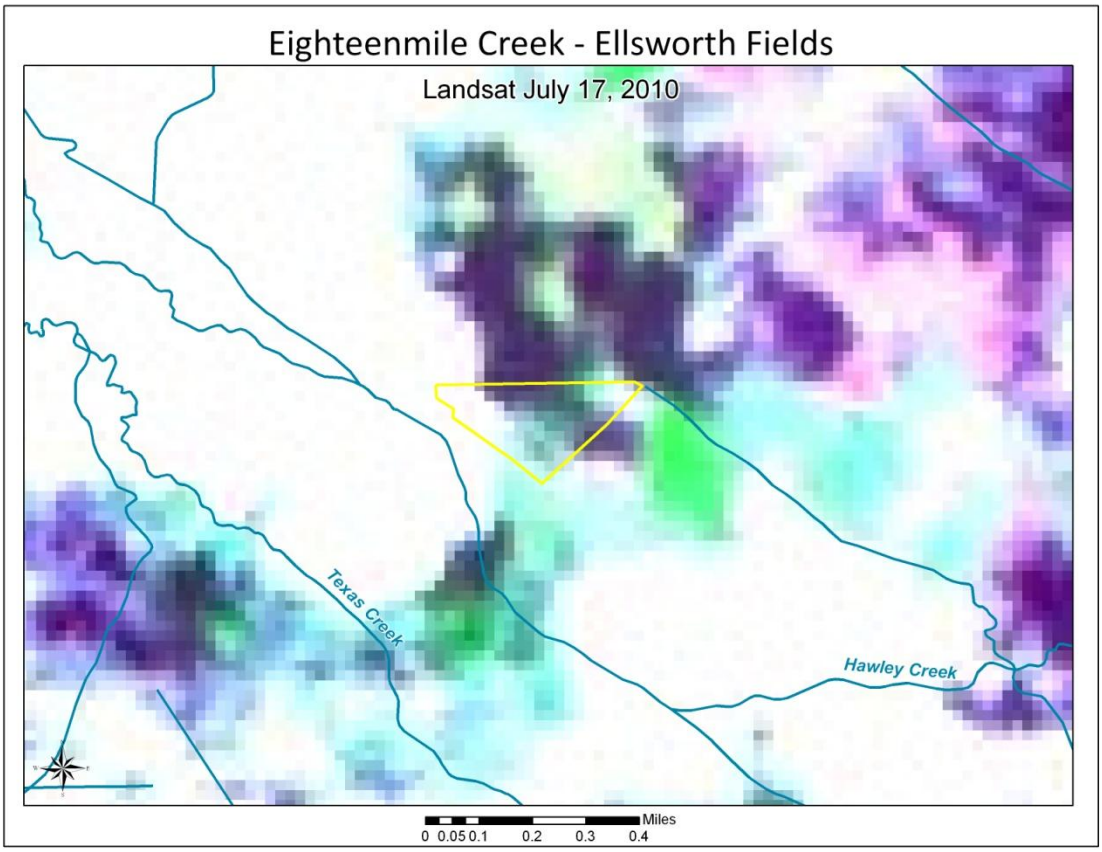

Figure 46. Landsat satellite imagery of the Eighteenmile Creek leased fields. Red indicates high evapo-transpiration rates.

A HOBO Tidbit temperature logger was deployed to record temperatures in Eighteenmile Creek. Unfortunately, a connection error led to the device being installed without initiating data collection. The logger will be re-deployed for data collection in 2011.

Site visits to Eighteenmile Creek on August 5, 2010 and September 1, 2010 confirmed that the Ellsworth diversion was not active. At both visits Hawley Creek was flowing (Figure 47), affirming the importance of having the Ellsworth diversion open to allow for fish passage.

Figure 47. Hawley Creek above confluence with Eighteenmile Creek on August 5, 2010 (left) and September 1, 2010 (right).

Photos were taken at specific locations to show flow in channel and to monitor any changes in riparian condition over time. Figure 48 shows a marked increase in riparian vegetation along the base of the incised channel.

Figure 48. Eighteenmile Creek downstream of Ellsworth diversion on July 19, 2006 (left) and September 1, 2010.

Physical Habitat Simulation (PHABSIM) results from a study on Eighteenmile Creek (Morris and Sutton 2007) were used to develop habitat availability during the lease period. Figures 49-51 represent the percentage of usable area for each species of concern. Juvenile habitat is not included due to limitations of the PHABSIM model.

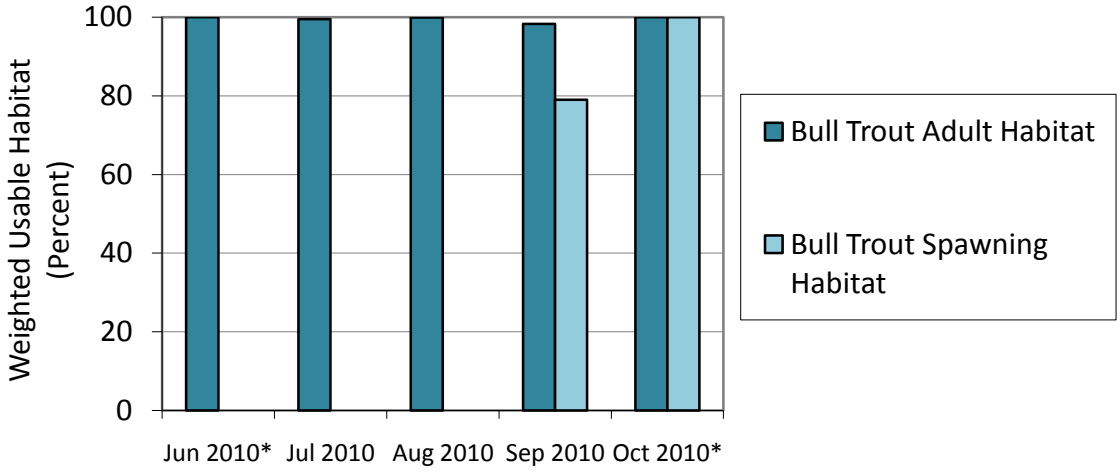

Figure 49. Percent weighted usable habitat for adult and spawning bull trout at mean monthly flows in 2010. * Flows in June and October were beyond the modeled range.

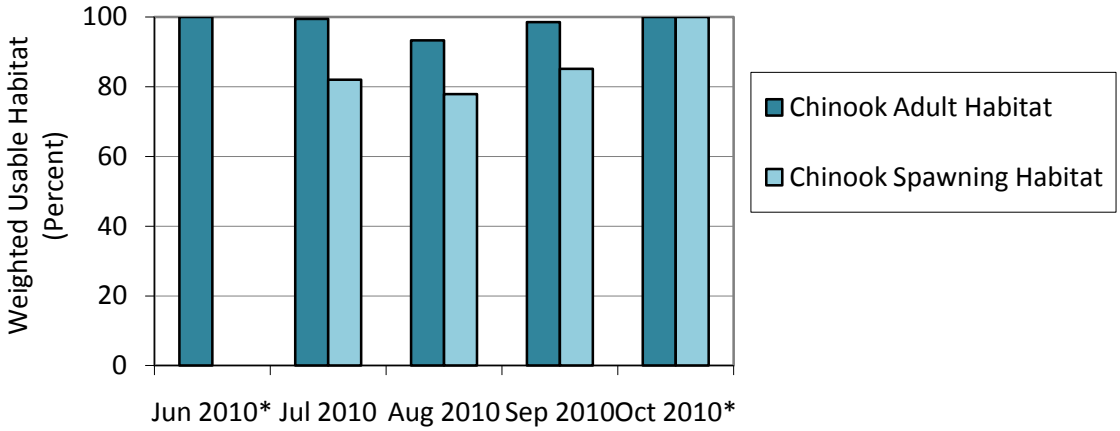

Figure 50. Percent weighted usable habitat for adult and spawning Chinook salmon at mean monthly flows in 2010. * Flows in June and October were beyond the modeled range.

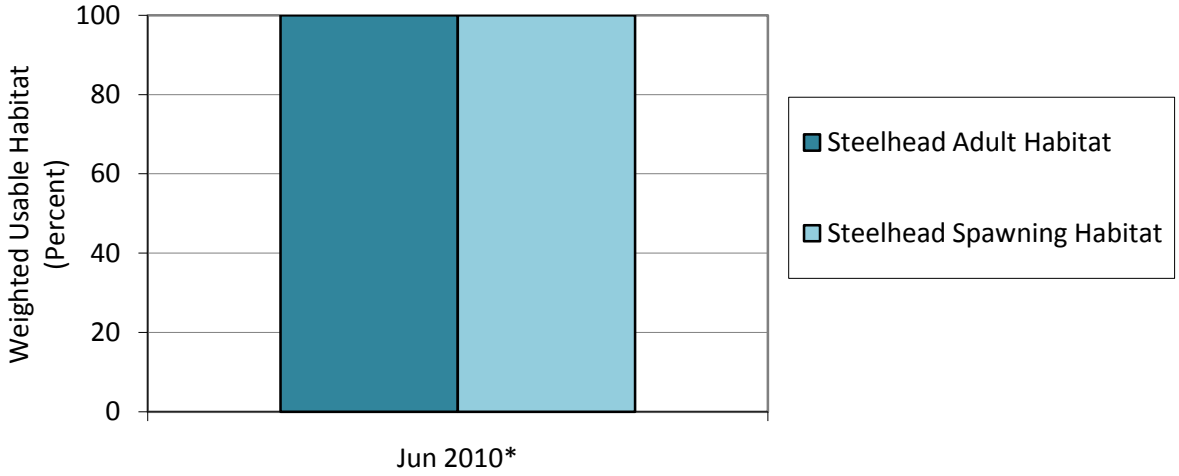

Figure 51. Percent weighted usable habitat for adult and spawning steelhead at mean monthly flows in 2010. * Flows in June were beyond the modeled range.

Whitefish Ditch – Lemhi River Basin

The Whitefish Ditch project removed a 2.8 mile long ditch that intercepted Eighteenmile Creek, Canyon Creek, and an unnamed stream before arriving at the place of use. This 19-year agreement not to divert leaves up to 7.54 cfs in the upper reaches of the Lemhi River, by moving the point of diversion 2.5 miles downstream. The elimination of this ditch also eliminated passage and flow barriers at Eighteenmile Creek and Canyon Creek.

A site visit on 8/5/2010 confirmed that the landowner was complying with the terms of the agreement. Gages in Canyon Creek and the Lemhi River monitored flow during the irrigation season (Figures 52 and 53). Loggers placed in Canyon Creek and the Upper Lemhi River recorded water temperature every 2 hours between January 1, 2010 and May 13, 2010 (Figures 54-55). Data through the rest of the year have not yet been downloaded by IDFG.

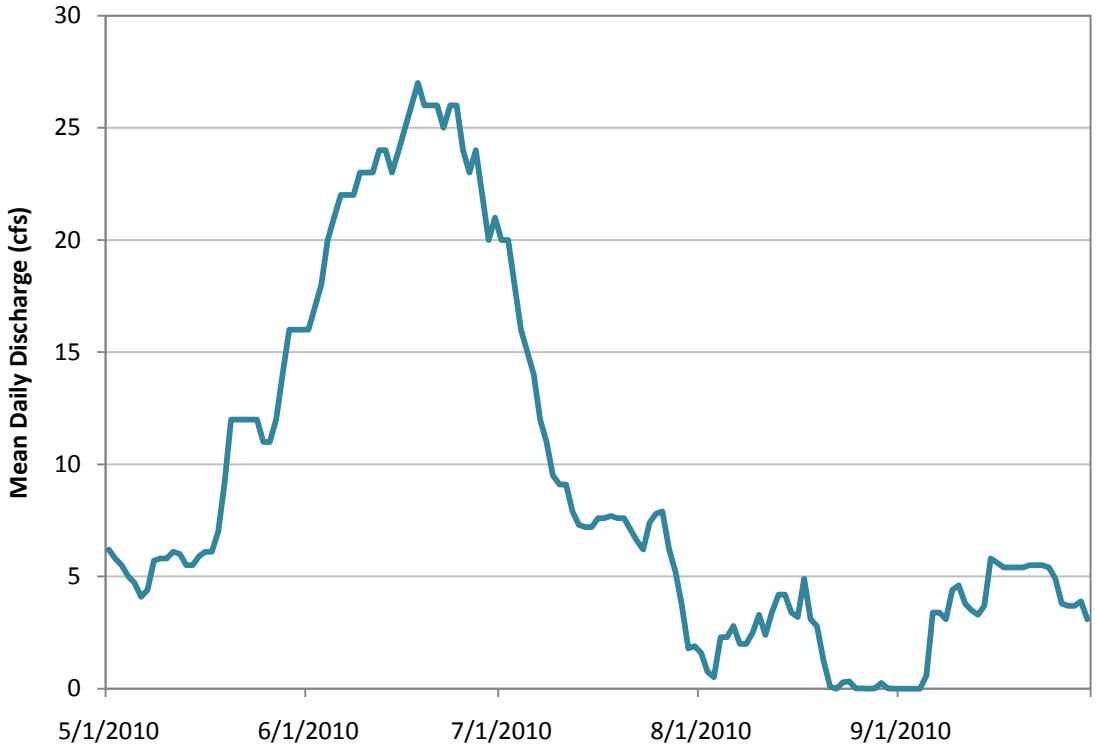

Figure 52. Canyon Creek mean daily flow below confluence with Whitefish Ditch, May 1 to September 30, 2010.

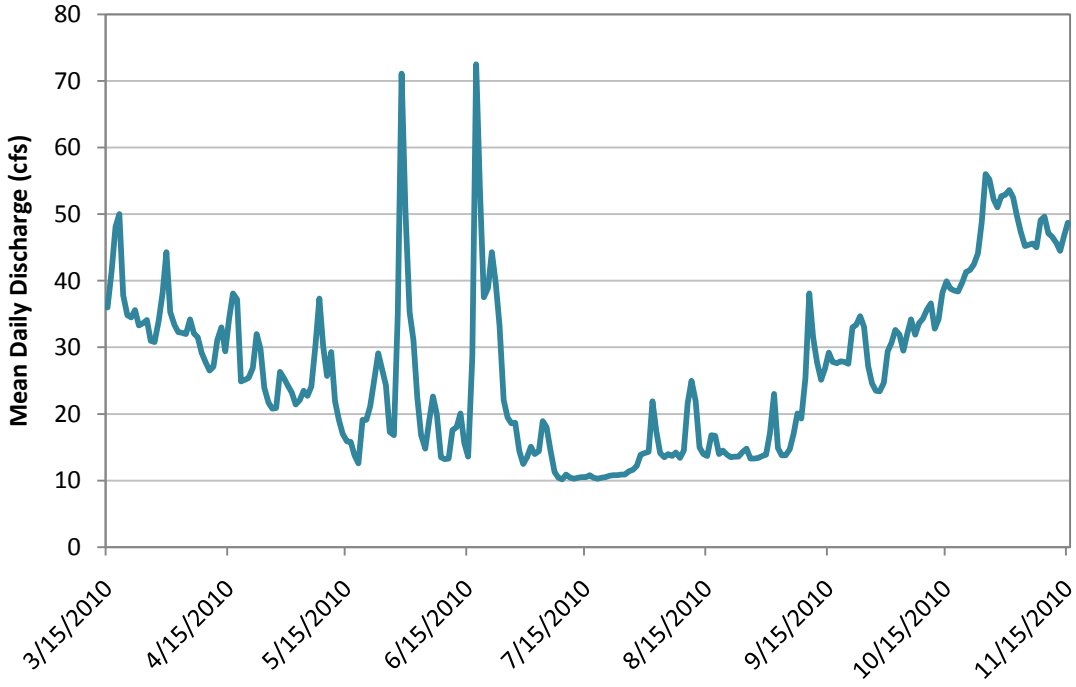

Figure 53. Lemhi River mean daily flow above L-63 diversion, May 1 to November 15, 2010.

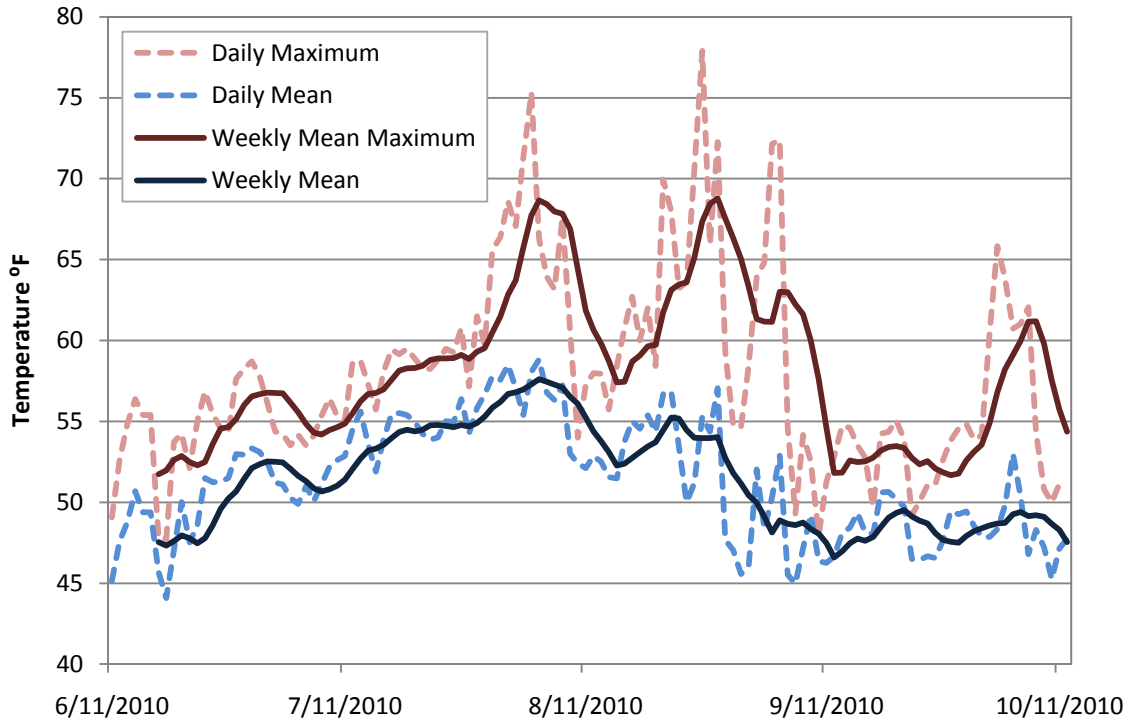

Figure 54. Canyon Creek (below old Whitefish ditch intercept) water temperature data (°F) as collected by HOBO Tidbit logger measuring every two hours from June11 – October 12, 2010.

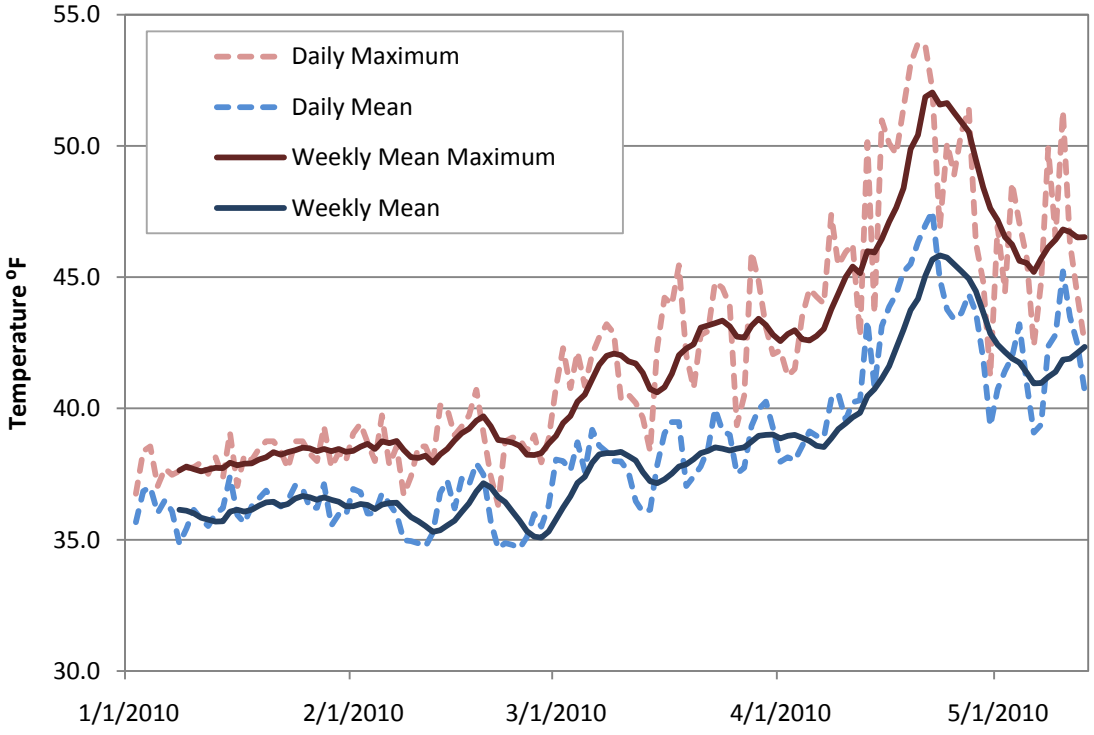

Figure 55. Lemhi River (below Leadore) water temperature data (°F) as collected by HOBO Tidbit logger measuring every two hours from January 1 to May 13, 2010.

Physical Habitat Simulation (PHABSIM) results from a study on Canyon Creek and the Upper Lemhi River (Morris and Sutton 2006) were used to develop habitat availability for those streams. Figures 56-59 represent the percentage of usable area for each species of concern. Juvenile habitat is not included due to limitations of the PHABSIM model. Idaho Fish and game conducted Chinook salmon redd surveys and observed 7 redds in the transaction's primary reach in the Lemhi River.

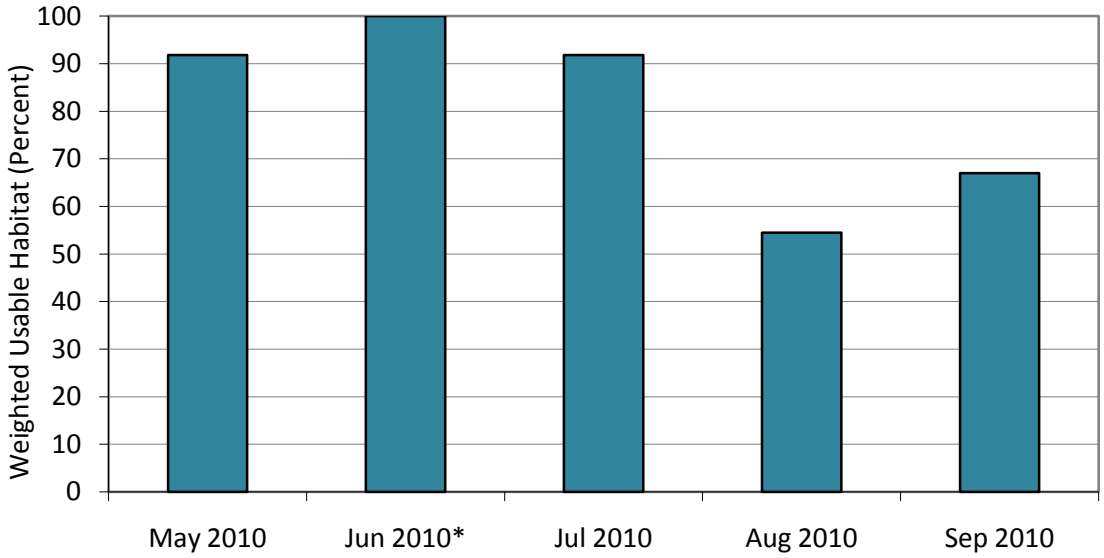

Figure 56. Percent weighted usable habitat for adult bull trout in Canyon Creek at mean monthly flows in 2010. No spawning habitat was available in the lower reach at all sampled flows due to a lack of suitable substrates.*Flows in June were above the modeled range.

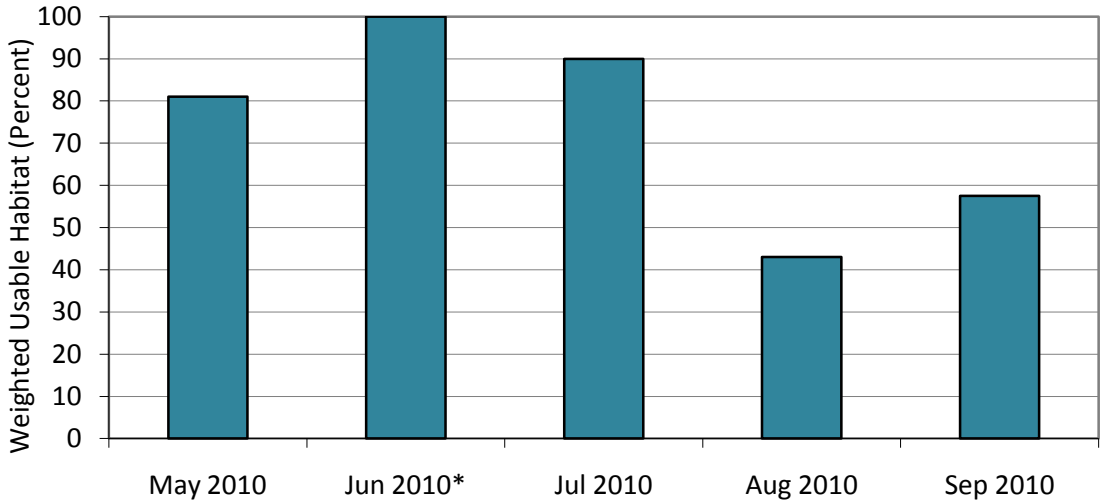

Figure 57. Percent weighted usable habitat for adult Chinook salmon in Canyon Creek at mean monthly flows in 2010. No spawning habitat was available in the lower reach at all sampled flows due to a lack of suitable substrates.*Flows in June were above the modeled range.

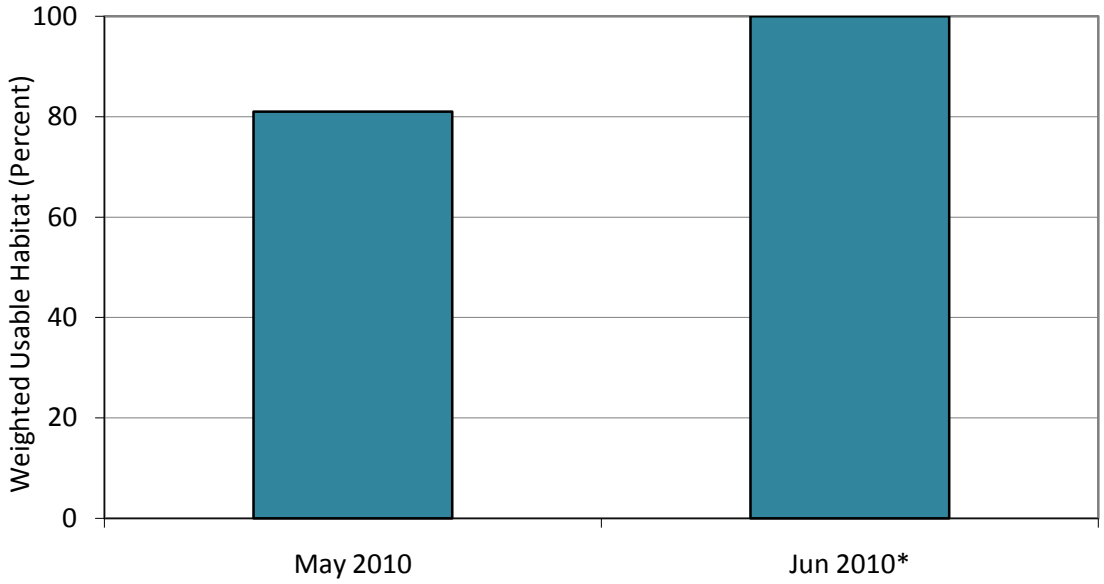

Figure 58. Percent weighted usable habitat for adult steelhead in Canyon Creek at mean monthly flows in 2010. No spawning habitat was available in the lower reach at all sampled flows due to a lack of suitable substrates.*Flows in June were above the modeled range.

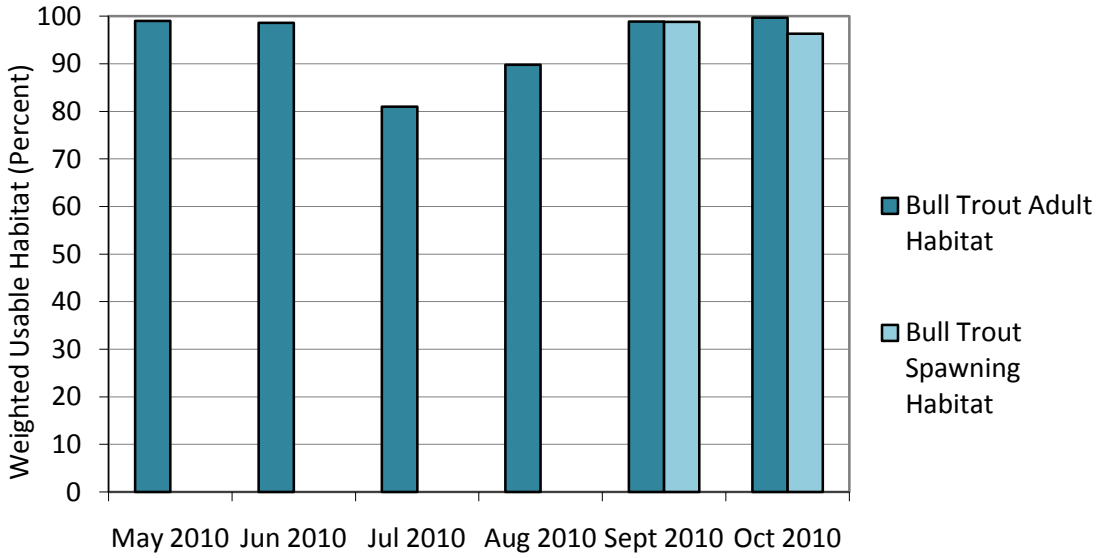

Figure 59. Percent weighted usable habitat for adult and spawning bull trout in the Upper Lemhi River below L-63 at mean monthly flows in 2010.

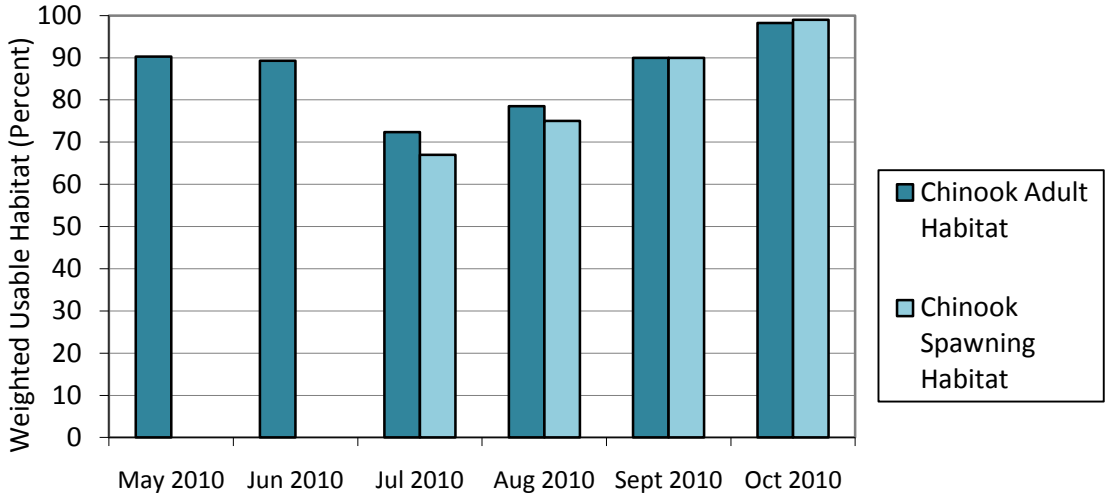

Figure 60. Percent weighted usable habitat for adult and spawning Chinook salmon in the Upper Lemhi River below L-63 at mean monthly flows in 2010.

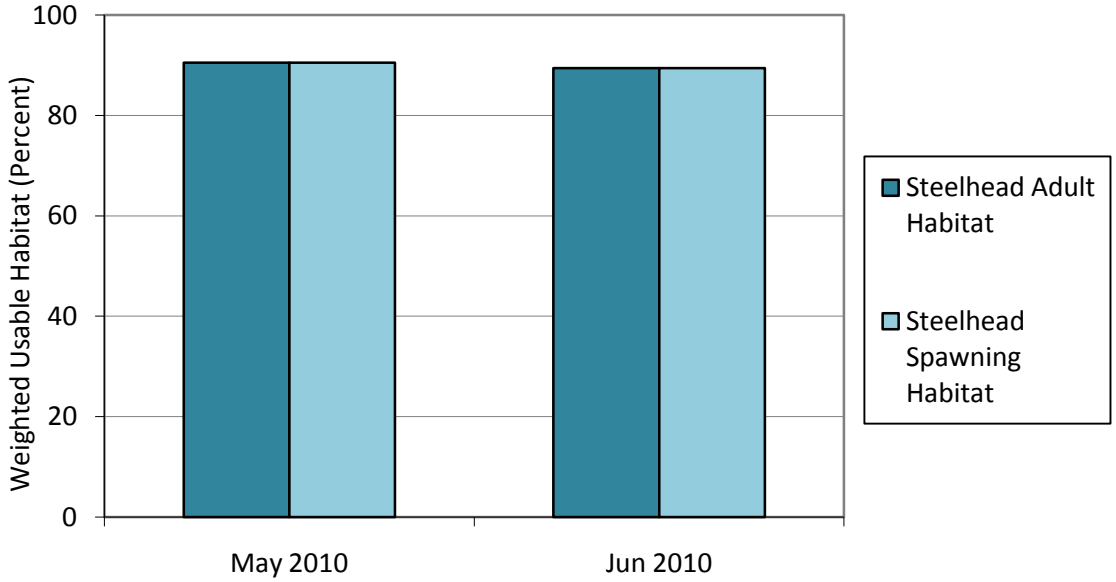

Figure 61. Percent weighted usable habitat for adult and spawning steelhead in the Upper Lemhi River below L-63 at mean monthly flows in 2010.

Big Timber Creek – Lemhi River Basin

The Big Timber Creek Tyler project is a twenty-year full-season agreement not to divert. Leadore land Partners (Tyler) added a point of diversion on the Lemhi River and agreed not to divert 4.5 cfs from Big Timber Creek, an USBWP SHIPUSS high priority stream. The water provides a partial reconnection to important spawning and rearing habitat for Chinook salmon, steelhead, and bull trout.

Site visits on 8/5/2010 and 8/31/2010 confirmed that the landowner was complying with the terms of the agreement. A gage in Big Timber Creek and instantaneous flow measurements monitored flow during the irrigation season (Figure 6**2**). Figure 6**3** show**s** pre- and post-project views of the Big Timber stream channel. A logger placed in Big Timber Creek by IDFG, recorded water temperature every 2 hours between January 1, 2010 and April 27, 2010 (Figure 64). Data from April 28th through the rest of the year has not yet been downloaded by IDFG.

Administration of the transfer proved to be difficult since the rating curve was not fully developed at low flows (high water in late spring and early summer resulted in a new channel profile). The Water District 74 W watermaster does not have access to a flow meter to take flow measurements for accurate administration. Bob Foster, an IDWR water agent in Salmon, took weekly flow measurements from August to his retirement in October. After discussions with IDFG, IDWR Water Distribution, and Water Districts 74 and 74W; it was determined that a weir should be installed to allow the Watermaster to adjust flows to 4.5 cfs daily. Funding for the weir was secured by IDFG; it will be installed in 2011.

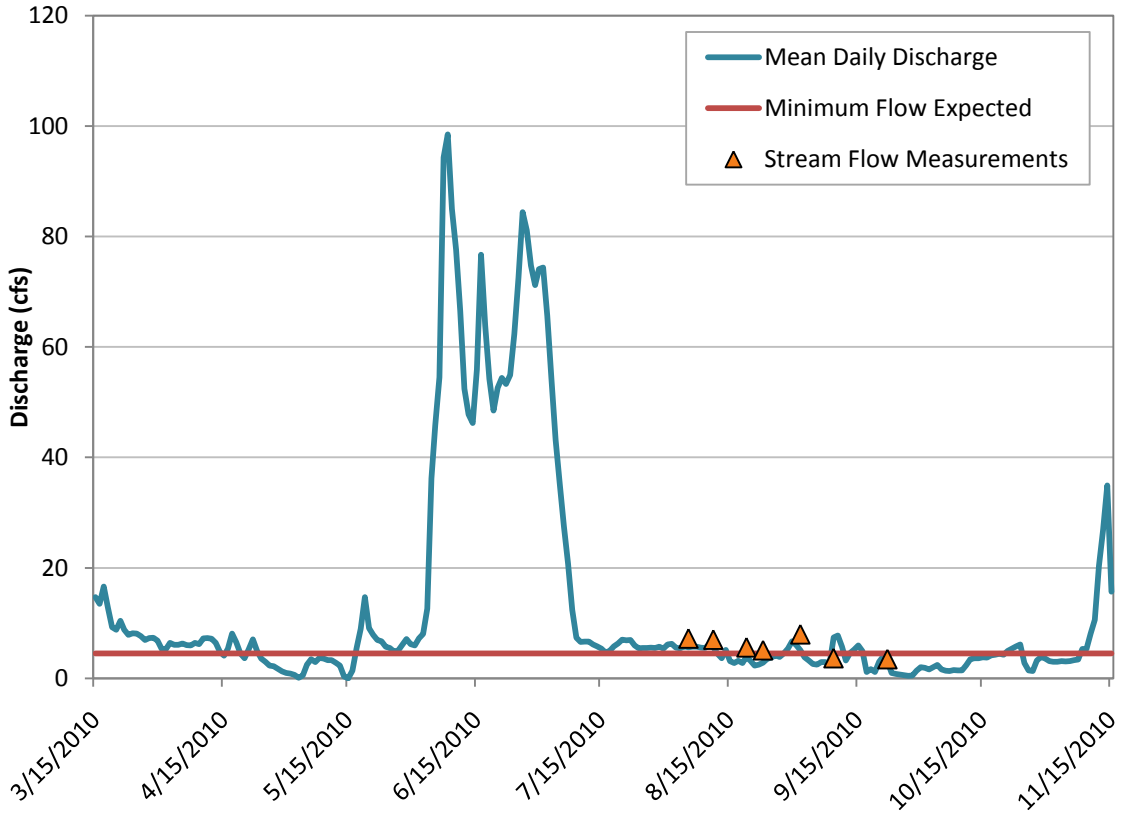

Figure 62. Big Timber Creek mean daily flow and instantaneous flow measurements above the back road March 15, 2010 to November 15, 2010.

Figure 63. Big Timber Creek below back road June 21, 2007 and August 31, 2010.

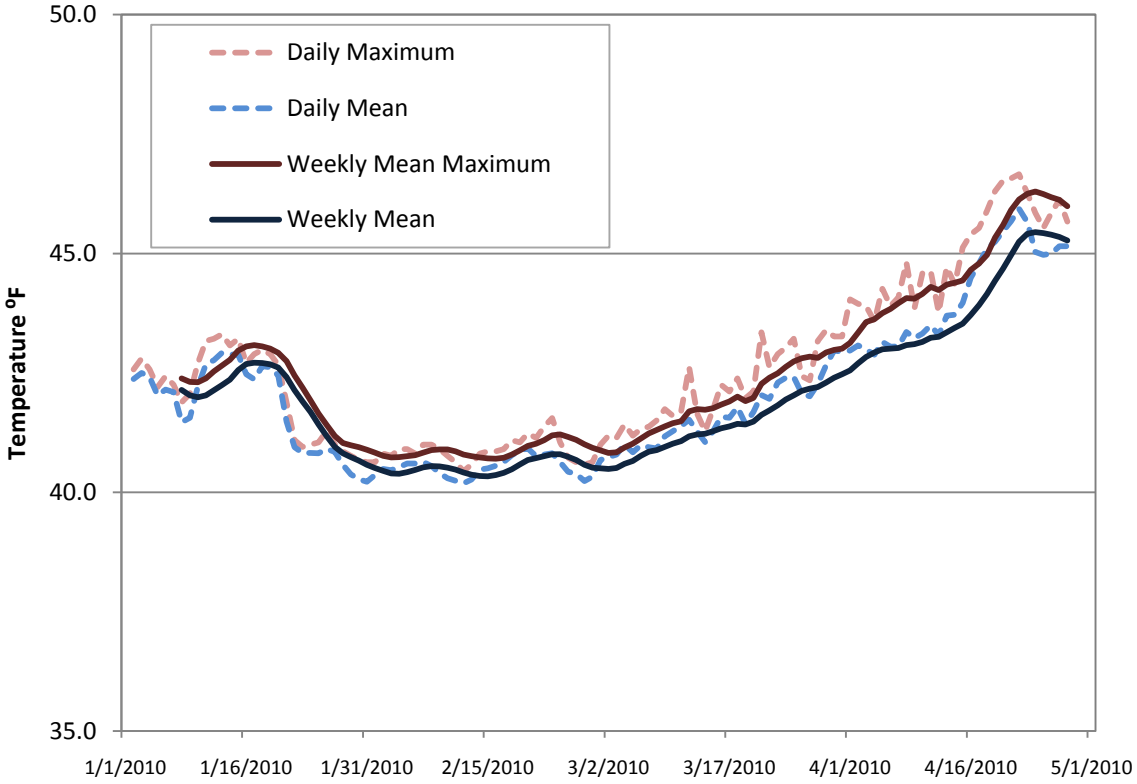

Figure 64. Big Timber Creek (near mouth) water temperature data (°F) as collected by HOBO Tidbit logger measuring every two hours from January 1 – April 27, 2010.

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