Water Transaction Program
Monitoring and Evaluation Report – 2006

Introduction

In 2006, the Idaho Department of Water Resources (IDWR) completed 9 water transactions in the Upper Salmon River basin (Alturas Lake Creek, Big Hat Creek, Lower Eighteenmile Creek - Ellsworth, Lower Eighteenmile Creek – Kruckeberg, Fourth of July Creek, Iron Creek, Lower Lemhi 2006, Morgan Creek, and Pole Creek). The Alturas Lake Creek, Lower Eighteenmile Creek – Kruckeberg, Iron Creek, and Morgan Creek projects represent leases new to the Water Transactions Program. These projects increased flows and provided valuable fish habitat and passage on more than 189 river miles in the Upper Salmon River Basin.

Alturas Lake Creek – Stanley Basin

The 2006 Alturas Lake Creek project is a one-year full-season lease. Katie Breckenridge leased 8.21 cfs, formerly irrigating 145 acres. The water is leased from May 1st through October 31st. The leased water restores the natural flow to Alturas Lake Creek, improving fish habitat.

Site visits to Alturas Lake Creek on May 29, July 31, and August 9th confirmed that the landowner was complying with the terms of the lease. Landsat images also show that the leased water was not being used to irrigate land (Appendix A). A gage in Alturas Lake Creek monitored flow in the river during the irrigation season (Figures 1 and 2).

Habitat assessment was conducted on August 9, 2006 in a 200-meter reach below the leased diversions. Riffle habitat made up 9% of the stream, glide-runs were 78%, and scour pools made up 13% of the habitat. Shrubs and conifers, with some grasses, dominate stream bank vegetation. Ideal Chinook salmon and steelhead spawning substrate particle size in Idaho ranges from fine gravel (6-7mm) to large cobble (128-255 mm) (Maret et al. 2003). Ninety-two percent of the substrate sampled in Alturas Lake Creek fell into the ideal spawning size range for Chinook salmon and steelhead (Figure 3). There has been no PHABSIM modeling of Alturas Lake Creek.

Chinook salmon redd aerial surveys conducted by Idaho Department of Fish and Game showed a redd in Alturas Lake Creek within the primary reach affected by the transaction.

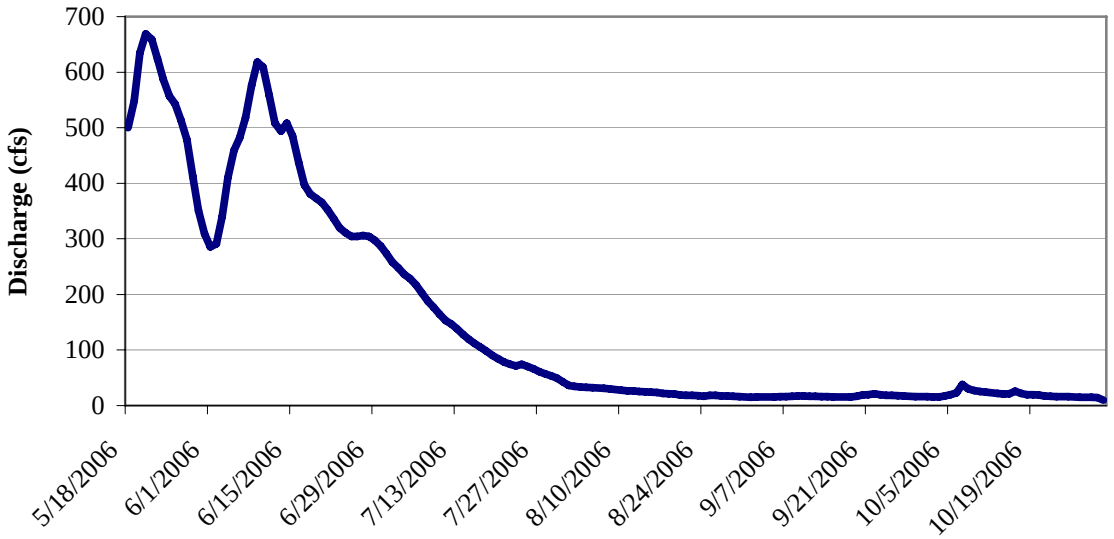


Figure 1. Alturas Lake Creek mean daily flow at Pettit Lane, May 18 to October 30, 2006.

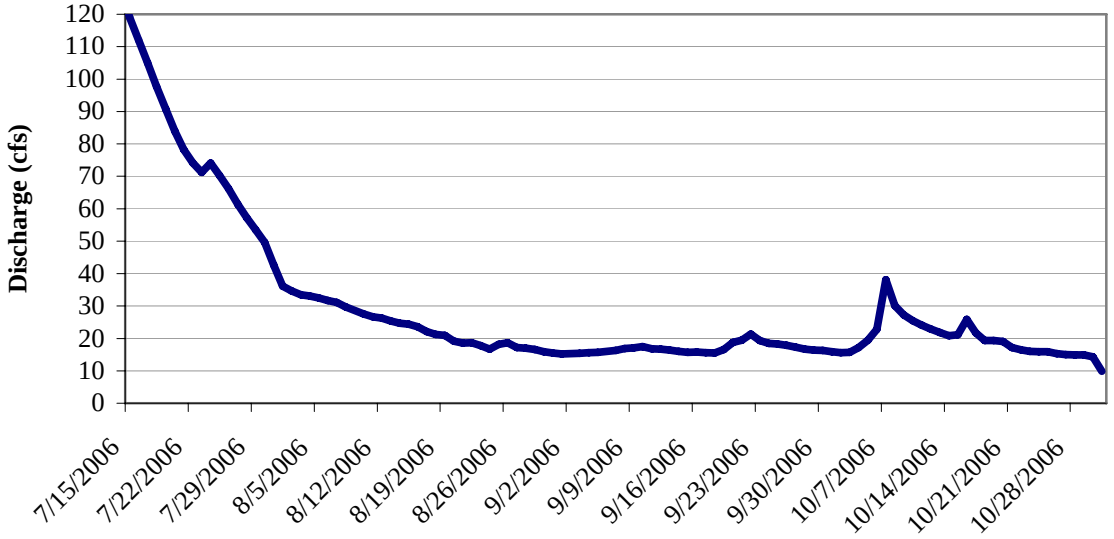


Figure 2. Alturas Lake Creek mean daily flow at Pettit Lane, July 15 to October 30, 2006.

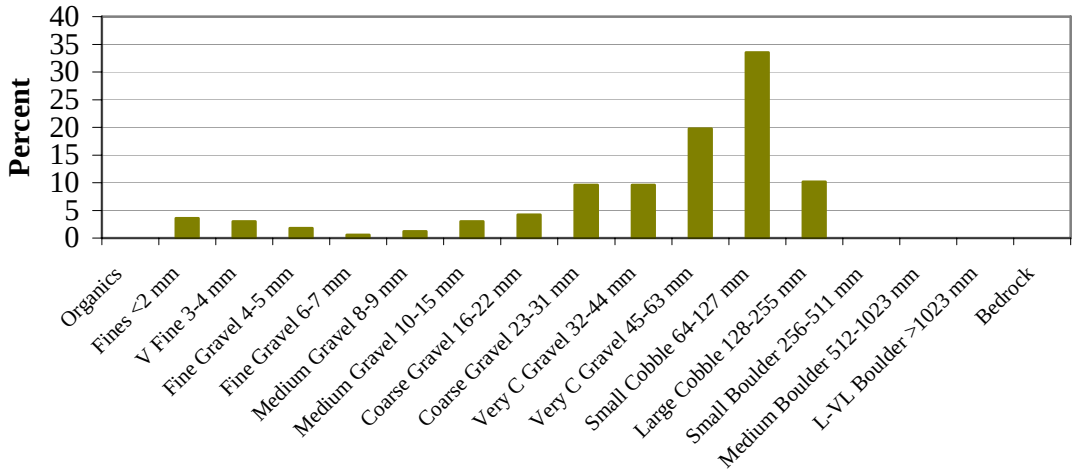


Figure 3. Alturas Lake Creek substrate size distribution as sampled in a 200-meter reach above Pettit Creek on August 9, 2006.

Beaver Creek – Stanley Basin

The Beaver Creek project was IDWR's first long-term lease. In the second 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 fish access to the upper reaches of Beaver Creek.

Site visits to Beaver Creek on May 29th and July 31st confirmed that the landowner was complying with the terms of the lease. Landsat images also show that the leased water was not being used to irrigate land (Appendix A). A gage in Beaver Creek monitored flow in the river during the irrigation season (Figures 4 and 5). The leased water provided a reconnect to Beaver Creek through late July. After mid-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. Since this is a 10 year lease, IDWR is working with the landowners and the Upper Salmon Basin Watershed Project to address dewatering issues related to channel morphology and stream bank stability in this reach. Cattle were not grazed on the property this year. The landowner has agreed to keep cattle off of the property, unless a riparian fence is constructed. IDWR expects riparian vegetation to improve under these conditions, which could reduce stream temperatures and improve bank stability.

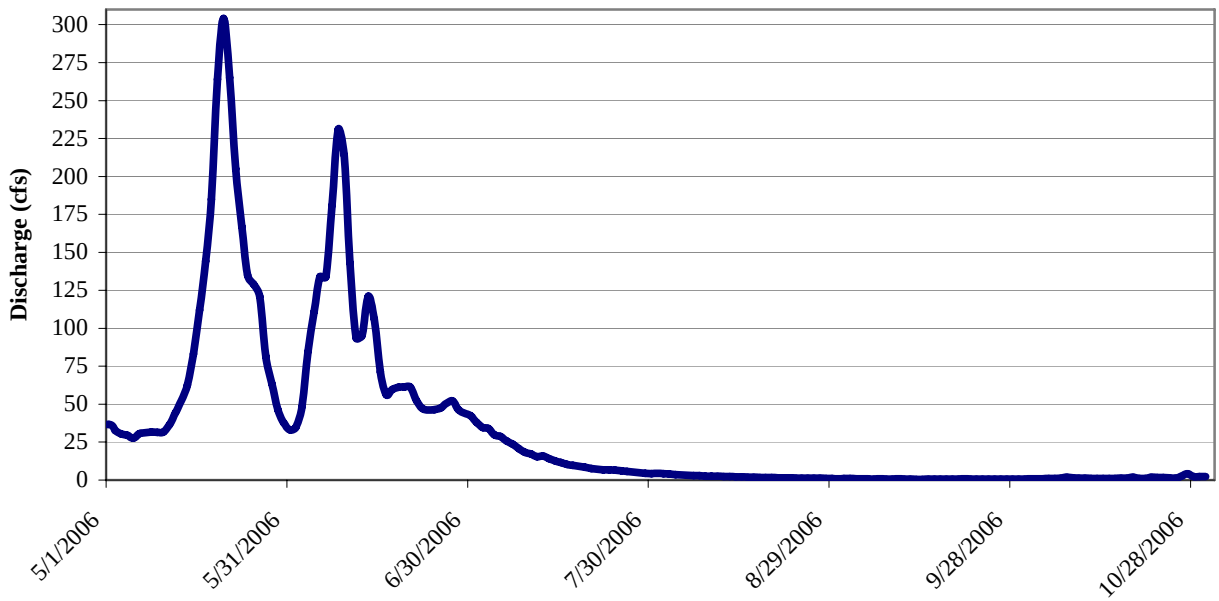


Figure 4. Beaver Creek mean daily flow at Highway 93, May 1 to October 30, 2006.

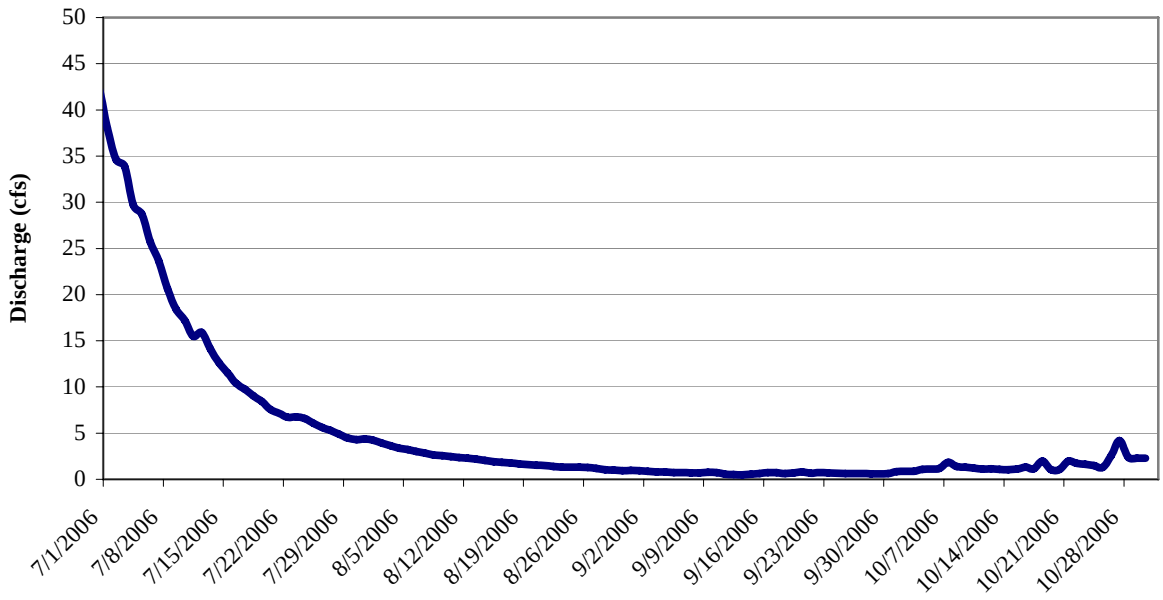


Figure 5. Beaver Creek mean daily flow at Highway 93, July 1 to October 30, 2006.

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 6-8 represent the percentage of usable area for each species of concern. Juvenile habitat is not included due to limitations of the PHABSIM model.

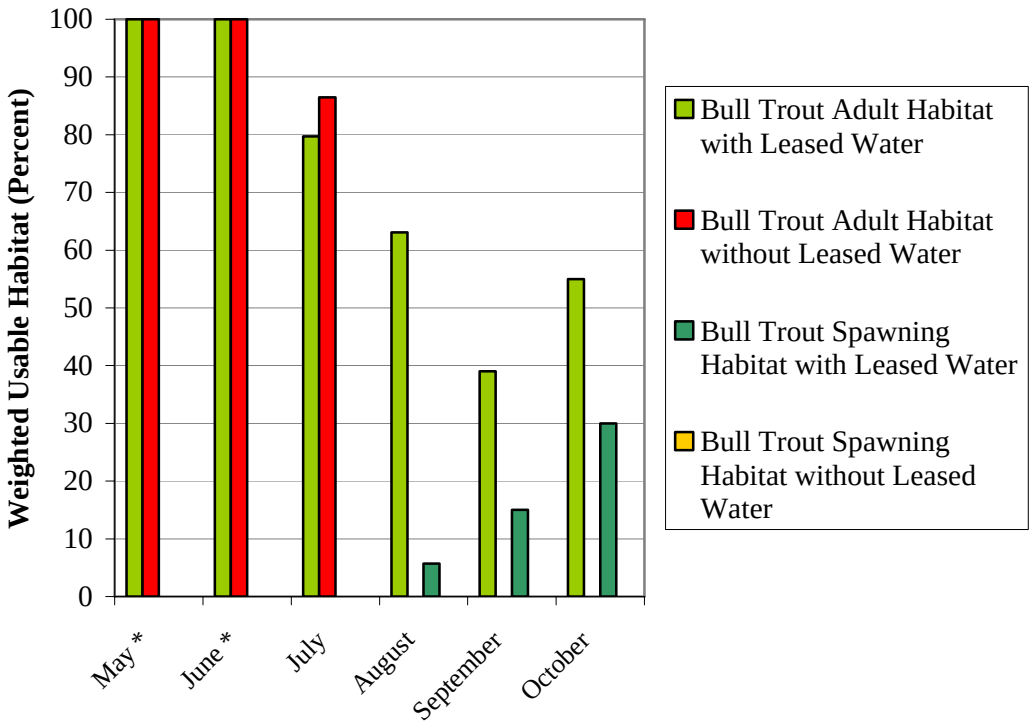


Figure 6. Percent usable habitat for adult and spawning bull trout at mean monthly flows including and excluding the leased 8.77 cfs. * Flows in May and June were beyond the modeled range.

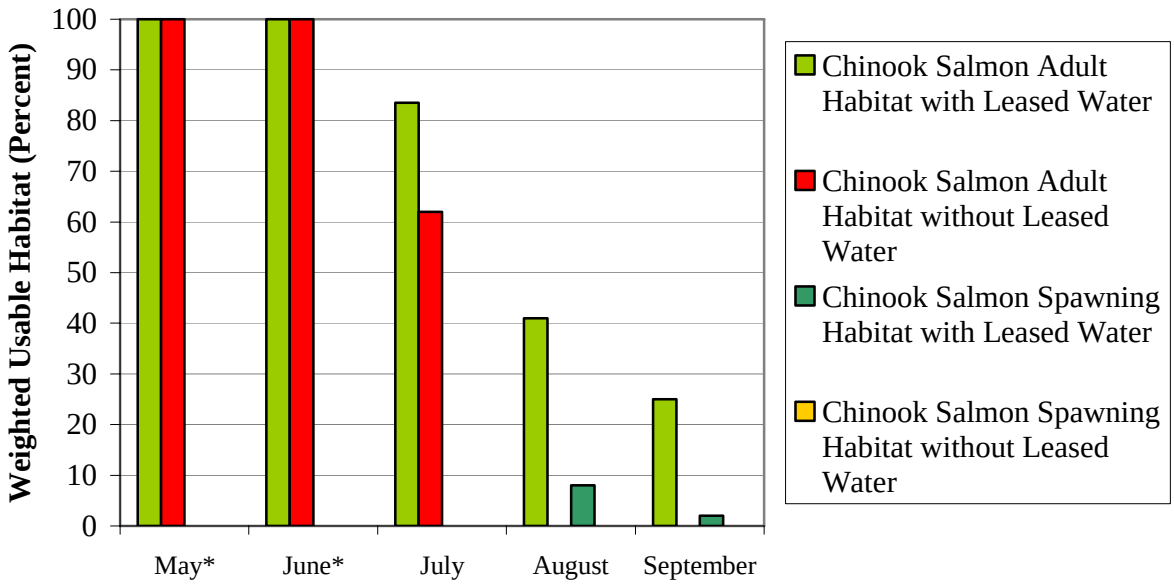


Figure 7. Percent usable habitat for adult and spawning Chinook salmon at mean monthly flows including and excluding the leased 8.77 cfs. * Flows in May and June were beyond the modeled range.

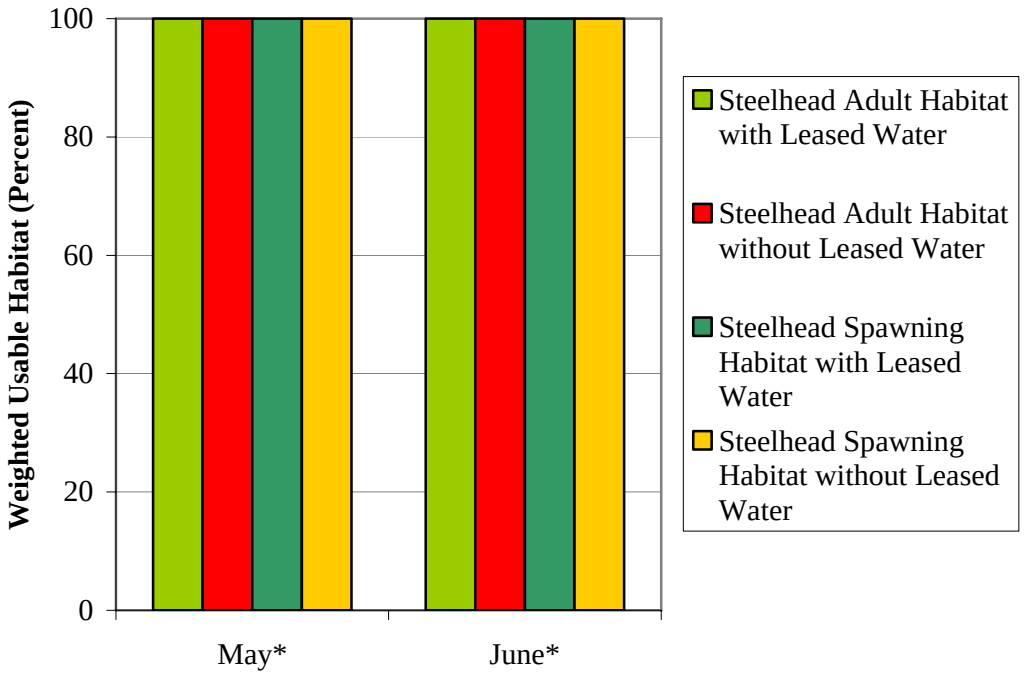


Figure 8. Percent usable habitat for adult and spawning steelhead at mean monthly flows including and excluding the leased 8.77 cfs. * Flows in May and June were beyond the modeled range.

Fourth of July Creek – Stanley Basin

IDWR negotiated a second two-year lease with Bill Vanderbilt for 2.9 cfs, formerly irrigating 43.1 acres. The water was leased from May 1 to Oct. 31. Approximately 2.0 miles of lower Fourth of July Creek was reconnected to the Salmon River. This provided fish access to the upper reaches. The Vanderbilts are amenable to a permanent transaction, once a tax assessment conflict can be resolved with Custer County.

Site visits to Fourth of July Creek on May 29th, August 2nd, and September 11th confirmed that the landowner was complying with the terms of the lease. Landsat images also show that the leased water was not being used to irrigate land (Appendix A). A gage in Fourth of July Creek monitored flow in the river during the irrigation season (Figure 9). The leased water provided a reconnect to the Salmon River throughout most of the irrigation season for juvenile salmon, steelhead and bull trout. Flows after July 7th fell below levels required for adult Chinook passage.

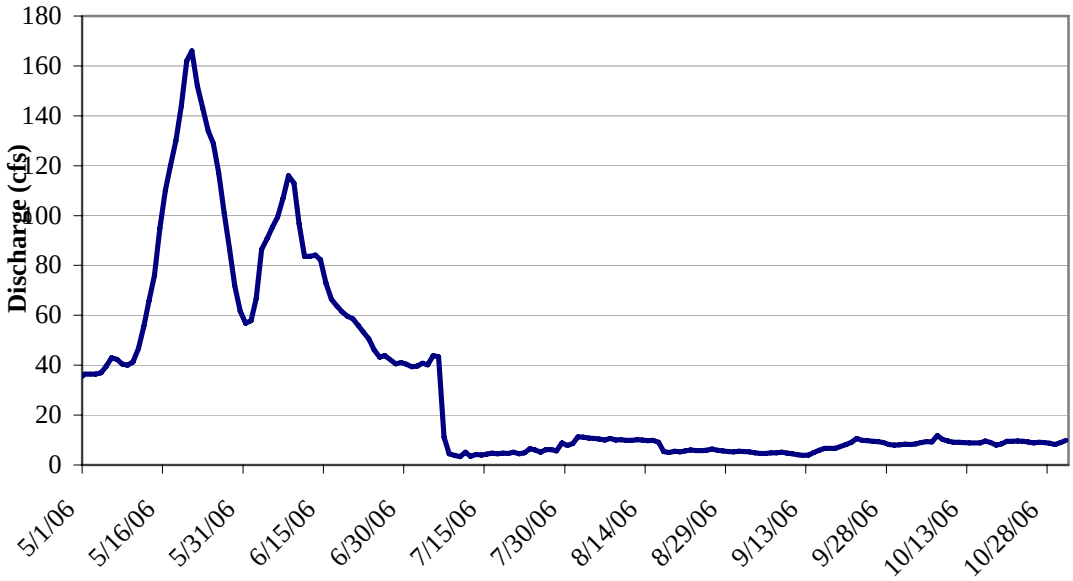


Figure 9. Fourth of July Creek mean daily flow at Highway 93, 2006.

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 10-12 represent the percentage of usable area for each species of concern. Juvenile habitat is not included due to limitations of the PHABSIM model.

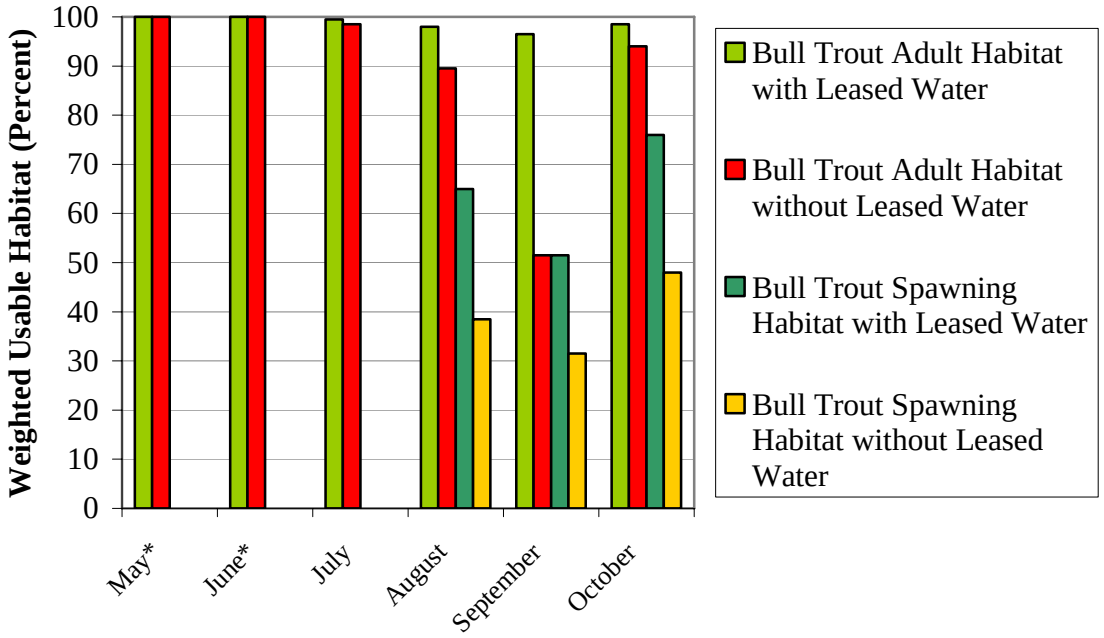


Figure 10. Percent weighted usable habitat for adult and spawning bull trout at mean monthly flows including and excluding the leased 2.9 cfs. * Flows in May and June were beyond the modeled range.

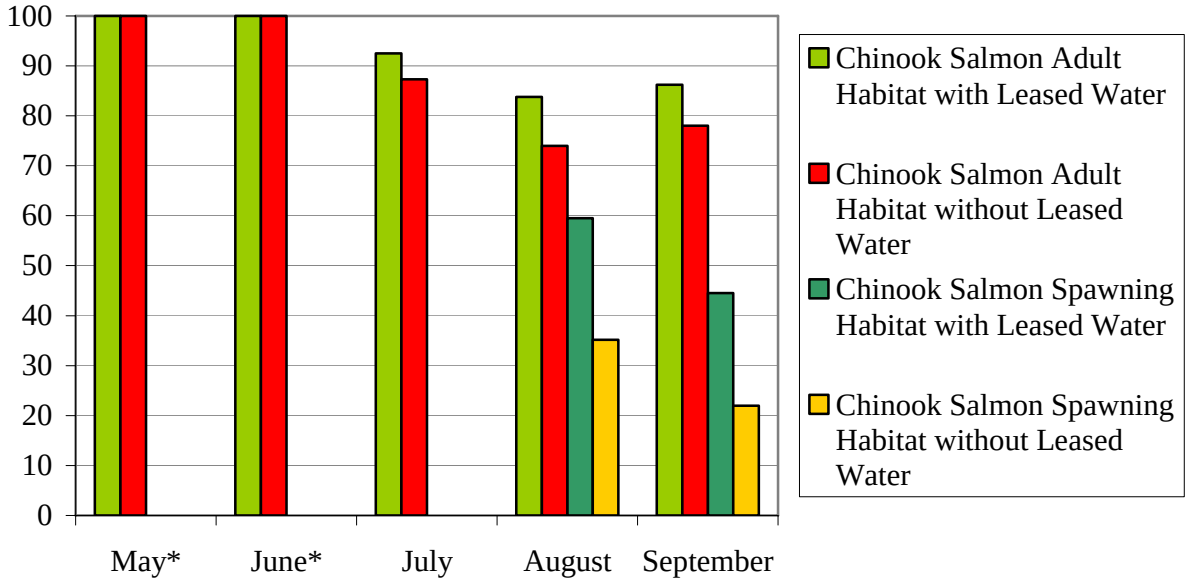


Figure 11. Percent weighted usable habitat for adult and spawning Chinook salmon at mean monthly flows including and excluding the leased 2.9 cfs. * Flows in May and June were beyond the modeled range.

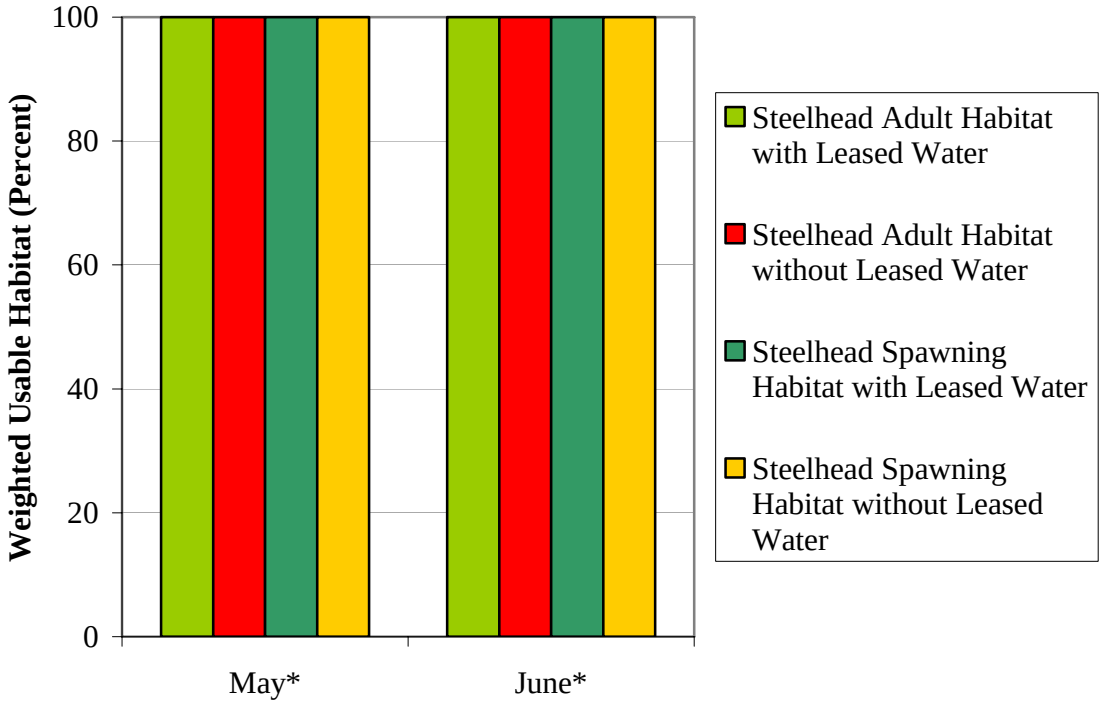


Figure 12. Percent weighted usable habitat for adult and spawning steelhead at mean monthly flows including and excluding the leased 2.9 cfs. * Flows in May and June were beyond the modeled range.

Idaho Department of Fish and Game has been conducting bull trout redd counts in Fourth of July Creek since 2003 (Murphy 2006). They show a marked increase in the total number of redds every year since 2003. In 2003, there were 16 redds, in 2004 there were 33, in 2005 there were 41 redds, and in 2006 there were 71 redds observed (Figure 13). This is most likely due to a combination of factors, one of which being the increased flow and connectivity to the Salmon River from IDWR's transaction. Other factors include improved diversion structures, fish screens and related IDFG activities.

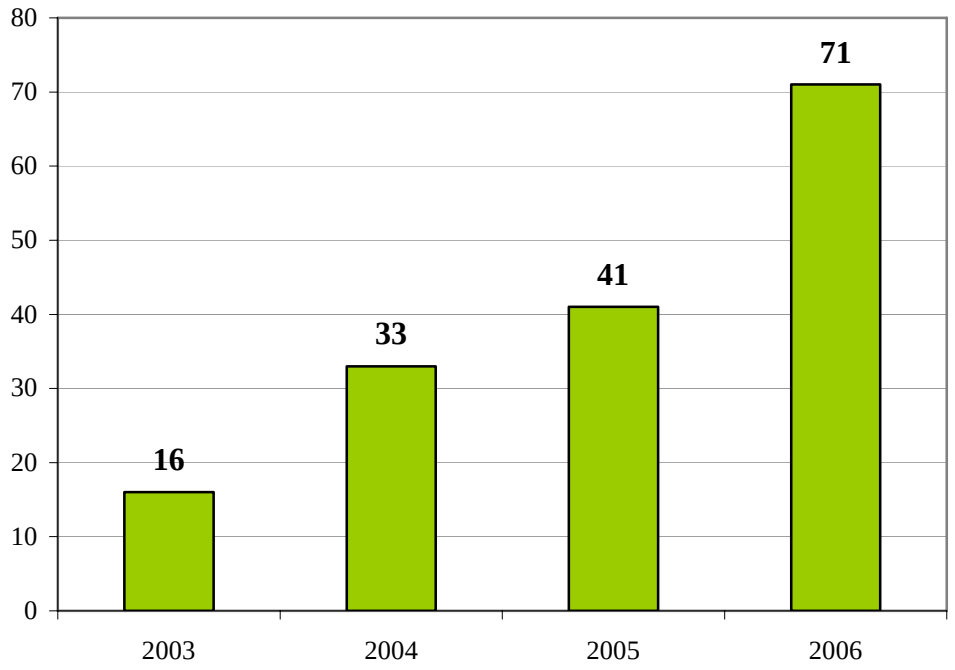


Figure 13. Annual counts of fluvial bull trout redds in Fourth of July Creek (SNRA) from 2003-2006 (Murphy 2006).

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, IDWR and Salmon Falls Sheep Company initiated an agreement not to divert. 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 will supply the landowner with a generator and the funds for fuel.

Site visits to Pole Creek on May 29th, July 31st, and September 11th 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 (Figures 14 and 15). Flows in Pole Creek during the term of the transaction never fell below 5 cfs. The landowner was not required to reduce his hydropower diversion and utilize the diesel generator. The five cfs flow was maintained without any additional expense.

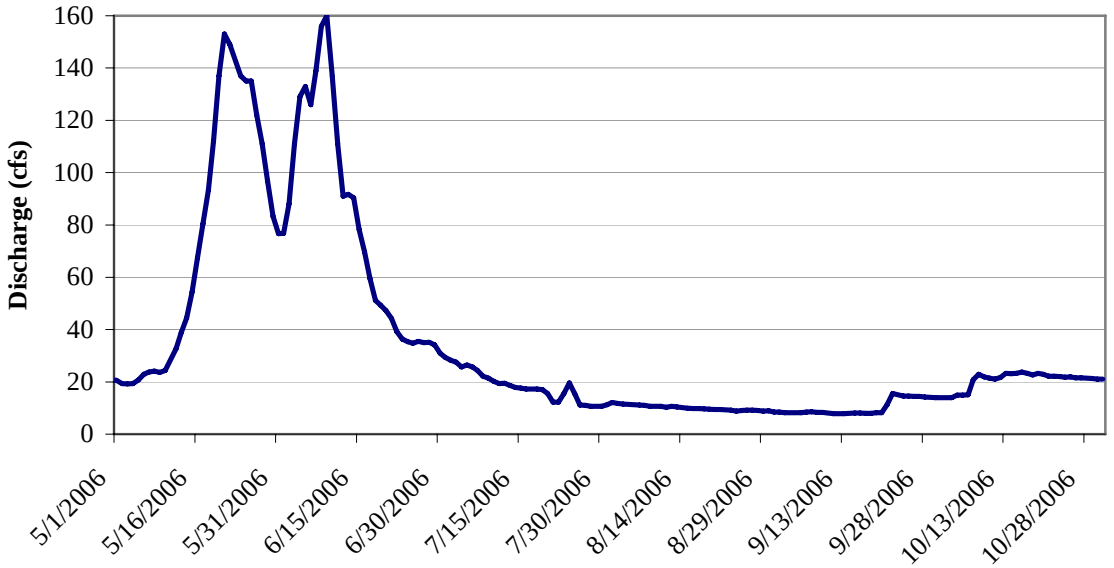


Figure 14. Pole Creek mean daily flow at Highway 93, May 1 to October 31, 2006.

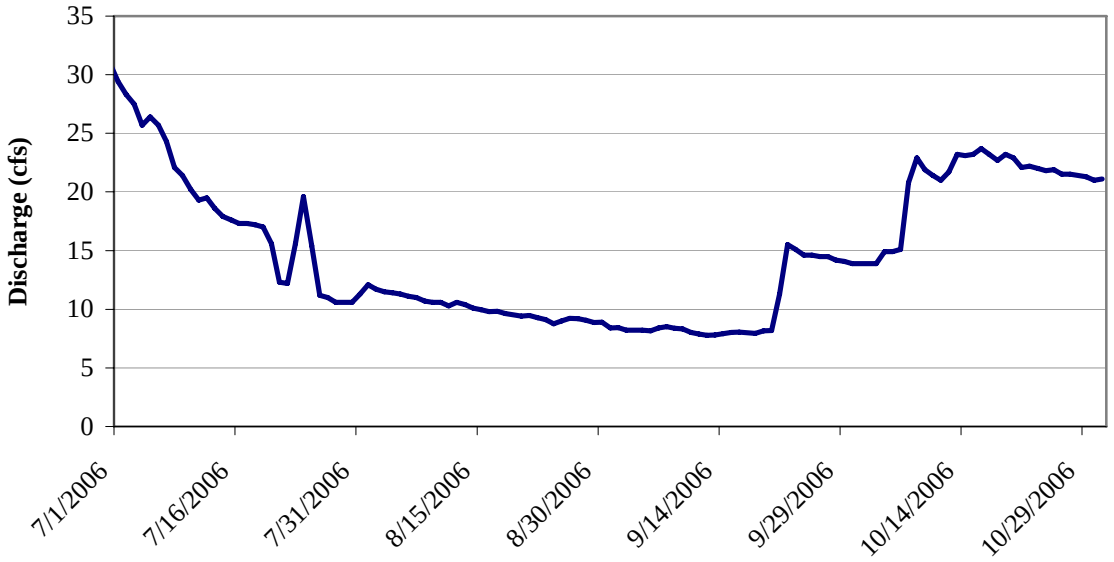


Figure 15. Pole Creek mean daily flow at Highway 93, July 1 to October 31, 2006.

Physical Habitat Simulation (PHABSIM) results from a study on Pole Creek (Maret et al. 2005) were used to develop habitat availability with 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.

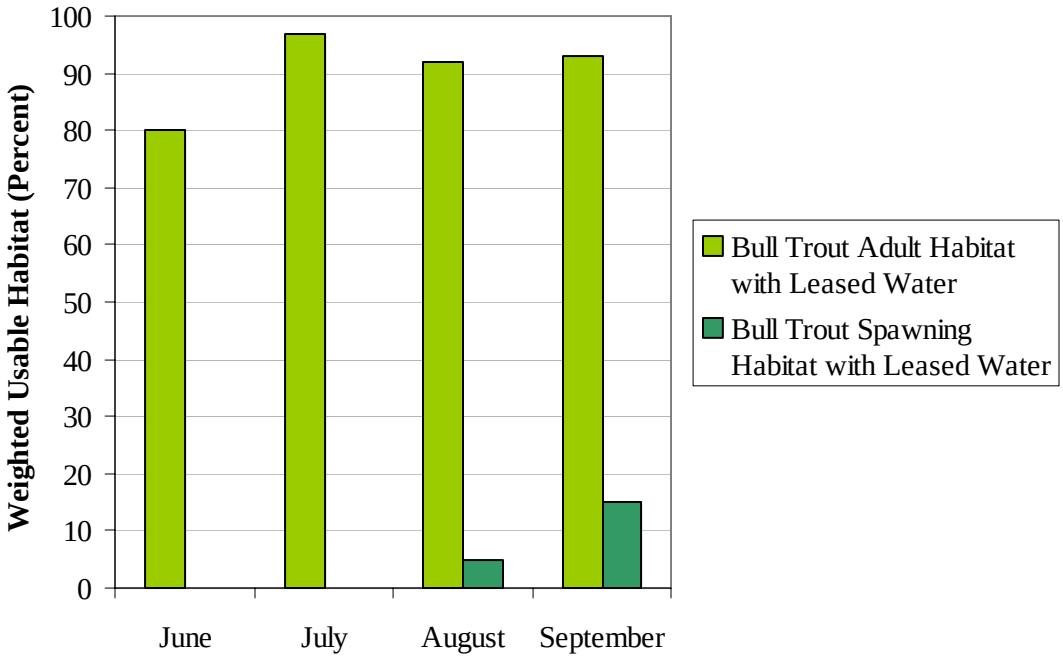


Figure 16. Percent weighted usable habitat for adult and spawning bull trout at mean monthly flows including the leased water.

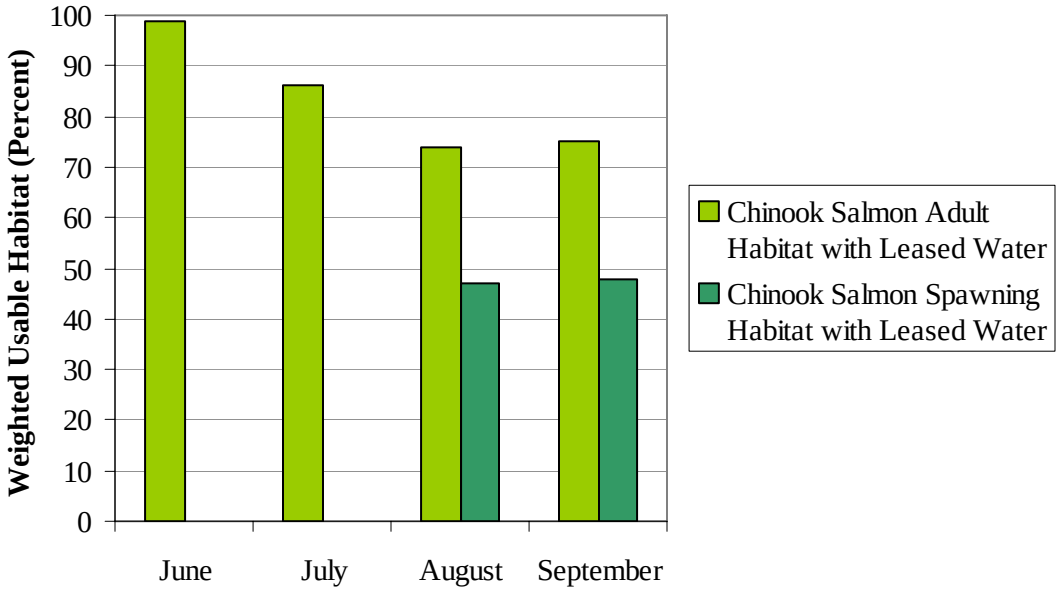


Figure 17. Percent weighted usable habitat for adult and spawning Chinook salmon at mean monthly flows including the leased water.

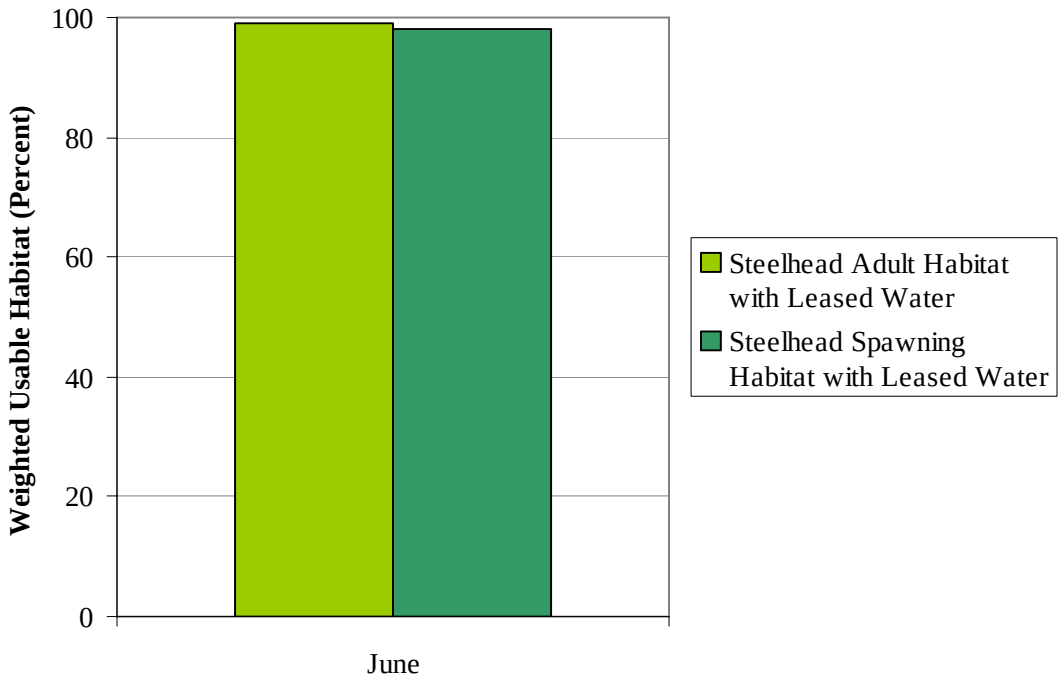


Figure 18. Percent weighted usable habitat for adult and spawning steelhead at mean monthly flows including the leased water.

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

IDWR negotiated a two-year lease with Erik Storlie and Tamara Kaiser for 0.5 cfs, formerly irrigating 35 acres. 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 fish access to the upper reaches of Big Hat Creek.
The landowners are amenable to a permanent transaction, once a partial decree is issued for Basin 75.

A site visit to Big Hat Creek on July 20th confirmed that the landowners were complying with the terms of the lease. Landsat images also show that the leased water was not being used to irrigate land (Appendix A). 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. A flow measurement on July 20th showed 1.5 cfs in Big Hat Creek at the former site of the gage. This Big Hat transaction removes the only diversion on Big Hat Creek, returning the stream to a natural flow. With seasonal 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.

There has been no PHABSIM modeling of Big Hat Creek. The lease is on an USBWP SHIPUSS high priority stream for flow enhancement within an ESU.

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

In early 2006, IDWR developed two one-year agreements not to divert on Morgan Creek. The agreements with Nyle Thornock and Delbert Hughes 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. Negotiations for longer-term agreements are currently under way.

Site visits to Morgan Creek on June 16, August 8, and September 12 confirmed that the landowners were complying with the terms of the agreement. An Aquarod installed by the US Forest Service monitored flows at the lower end of the primary reach (Figure 19). Flows did drop below 2 cfs for several days at a time throughout the irrigation season. A rating curve has been developed for the primary reach, making it possible to identify the stage that corresponds to 2 cfs. This information will make it easier for the landowners to regulate flows.

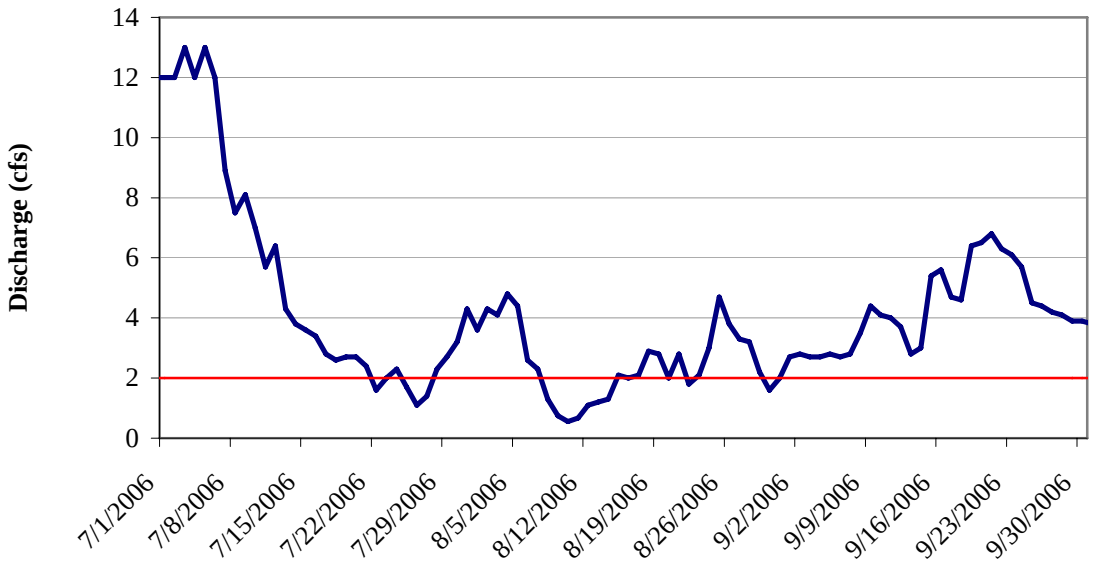


Figure 19. Morgan Creek mean daily flow below Highway 93, July 1 to September 30, 2006.

A PHABSIM study conducted on Morgan Creek in 2005 did not model flows below 10 cfs.

Iron Creek Phase 1– Mainstem Salmon River Basin (Pahsimeroi River – Lemhi River)

The 2006 Iron Creek project is a one-year full-season agreement not to divert. Clyde and Jeannie Phillips added a point of diversion on the Salmon River and agreed not to divert 4.8 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. IDWR will negotiate Phase Two with the Phillips in 2007. A 20-year payment of increased diversion costs will allow the Phillips to convert their entire Iron Creek 7.08 cfs to a Salmon River diversion.

Site visits to Iron Creek on June 7th and August 8th 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 20 and 21).

Habitat assessment was conducted on August 8, 2006 in a 150-meter reach below the leased diversions. Riffle habitat made up 57% of the stream, glide-runs were 7%, and scour pools made up 36% of the habitat. Shrubs and conifers, with some grasses, dominate stream bank vegetation. Ideal Chinook salmon and steelhead spawning substrate particle size in Idaho ranges from fine gravel (6-7mm) to large cobble (128-255 mm) (Maret et al. 2003). Eighty-six percent of the substrate sampled in Iron Creek fell into the ideal spawning size range for Chinook salmon and steelhead (Figure 22). There has been no PHABSIM modeling of Iron Creek.

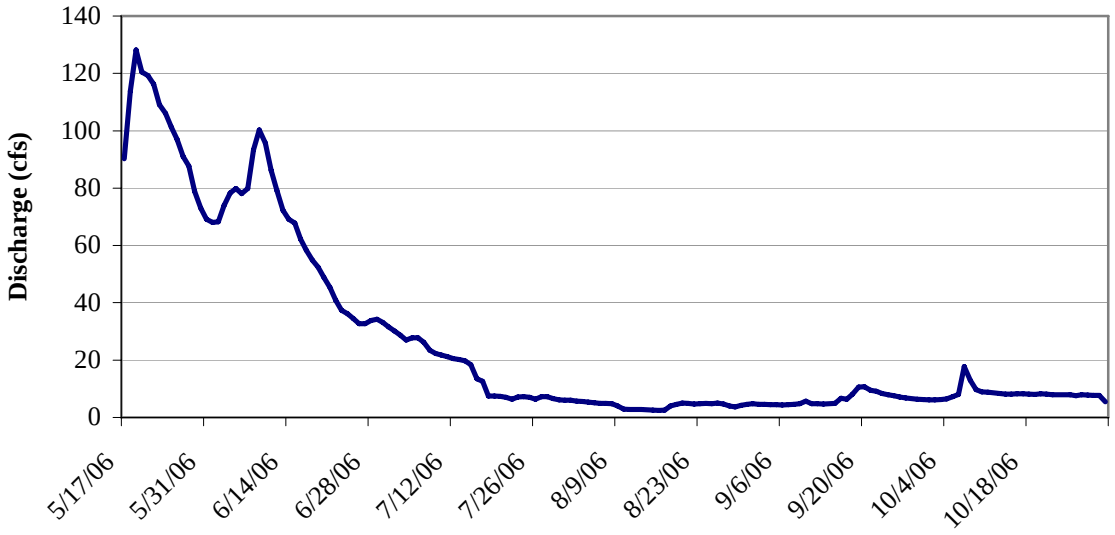


Figure 20. Iron Creek mean daily flow below Phillip's Bridge, May 17 to October 31, 2006.

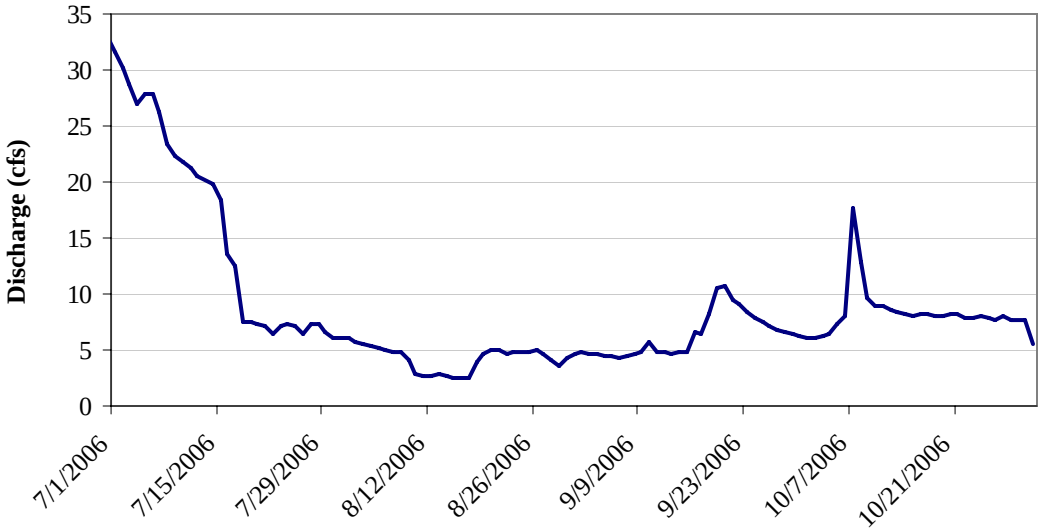


Figure 21. Iron Creek mean daily flow below Phillip's bridge, July 1 to October 31, 2006.

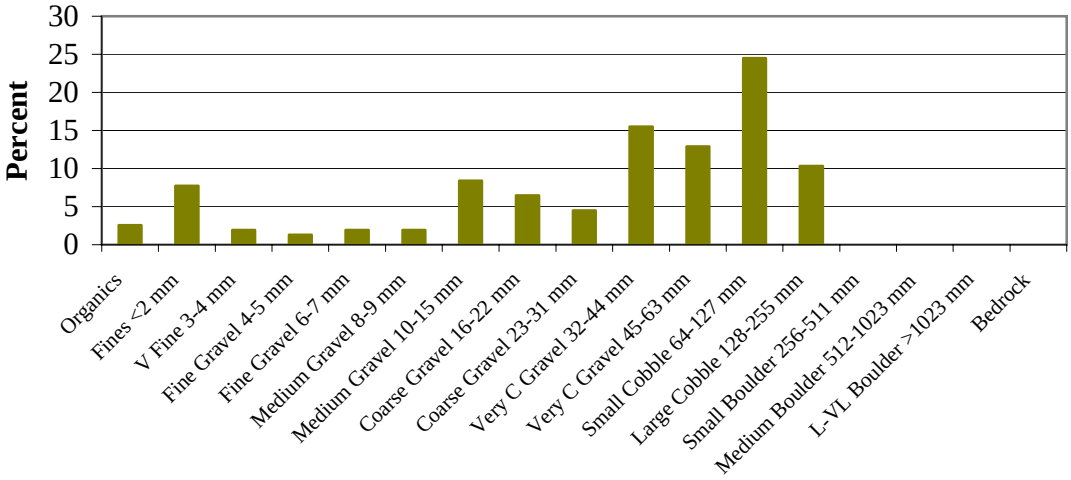


Figure 22. Iron Creek substrate size distribution as sampled in a 150-meter reach above the first culvert on August 8, 2006.

Lemhi River Agreement not to Divert - Lemhi River Basin

Through agreements not to divert water at the L6 diversion with 13 landowners, in cooperation with Water District 74, water was acquired, as needed, to maintain up to 35 cfs from May 15 through June 30. Water was acquired for 61 days. The transaction is 25% of the Lemhi Conservation Agreement (agreement not to divert among multiple water users) to maintain 35 cfs in the Lemhi River for 80% of the days and 25 cfs for 20% of the days commencing on March 15 and continuing through June 30 for 2005. The water provides 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, administers this project. He adjusted the flows at L6 to meet the Lemhi Conservation Agreement flows. NMFS also monitored the real-time flow at USGS Lemhi River gage at L5, to ensure compliance with the Agreement. Figure 23 shows the flows at L5 when the Lemhi River was in regulation.

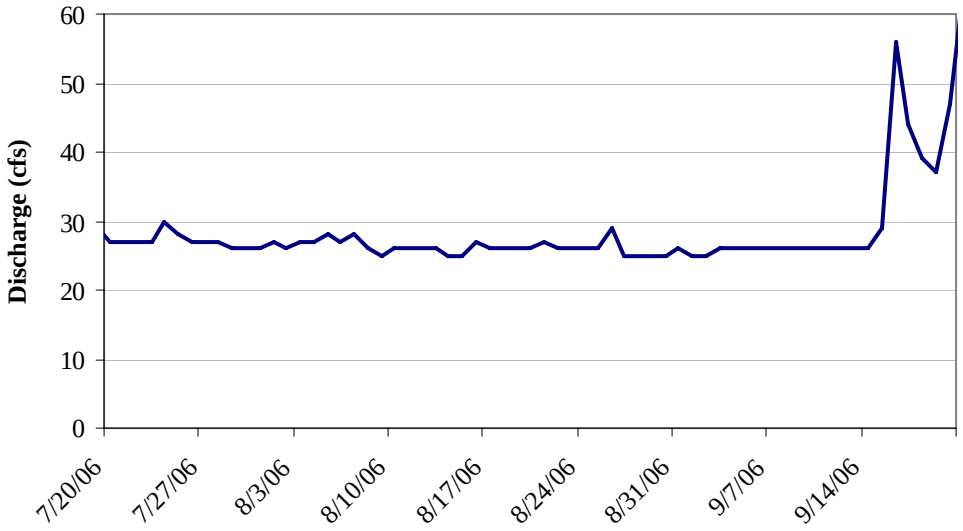


Figure 23. Lemhi River mean daily flow at L5, July 20 to September 20, 2006.

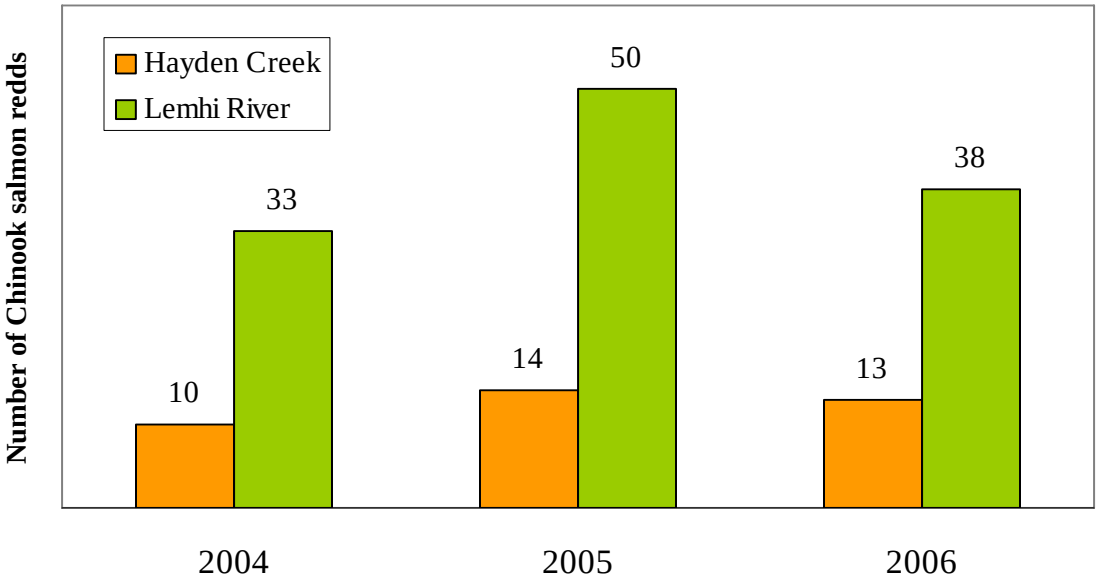


Figure 24. Lemhi River and Hayden Creek Chinook salmon redds 2004-2006 (Lutch 2006).

Eighteenmile Creek – Upper Lemhi River Basin

This is the second year IDWR has leased water for Eighteenmile Creek. A ten-year partial season lease with the Ellsworth Angus Ranch provides 0.5 cfs, formerly irrigating 26 acres. 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 Eighteen Mile Creek, and the Lemhi River, when sufficient flows are present. A one-year partial season lease with James Kruckeberg provided 1.8 cfs; formerly irrigating 153 acres. The water was leased from July 1 to November 15. IDWR is working towards a long-term lease with the new owners of the Kruckeberg property, as well as the elimination of a ditch that intercepts Eighteenmile Creek near the mouth, delivering flows to Canyon Creek. The implementation of these projects would ensure that any flow coming down Hawley and Eighteenmile Creek would provide a reconnect for Chinook salmon, rainbow trout, and bull trout.

Site visits to Eighteenmile Creek on April 27th, June 12th, and July 19th confirmed that the landowners were complying with the terms of the leases. Landsat images also show that the leased water was not being used to irrigate land (Appendix A). Eighteenmile Creek had water flowing past the confluence with Hawley Creek for almost the entire irrigation season, creating an instream flow to at least the confluence with Canyon Creek downstream of Leadore.

PHABSIM modeling was conducted on Eighteenmile Creek during the 2006 irrigation season. Results will be available in 2007. Jude Trapani, a fish biologist with the Bureau of Land Management, observed bull trout in the upper reaches of Eighteenmile Creek while conducting a spawning survey in September 2006.

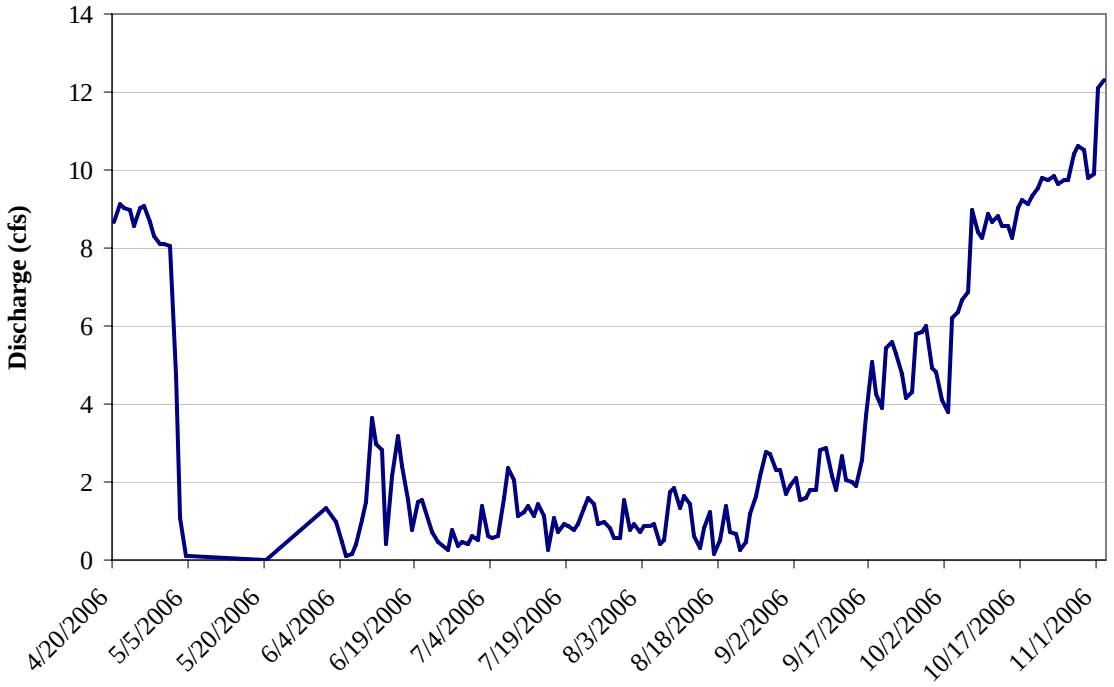


Figure 25. Eighteenmile Creek mean daily flow below confluence with Hawley Creek, April 20 to November 2, 2006.

Photos of all transactions will be available on the IDWR ftp site (ftp://ftp.state.id.us/IDWR/Outgoing/) in the folder named "2006_WTP_M-E_Photos.zip" until March 31, 2007. After than time they will be available upon request from IDWR.

References

Lutch, J. 2006. Fishery Staff Biologist. Idaho Department of Fish and Game. Personal communication.

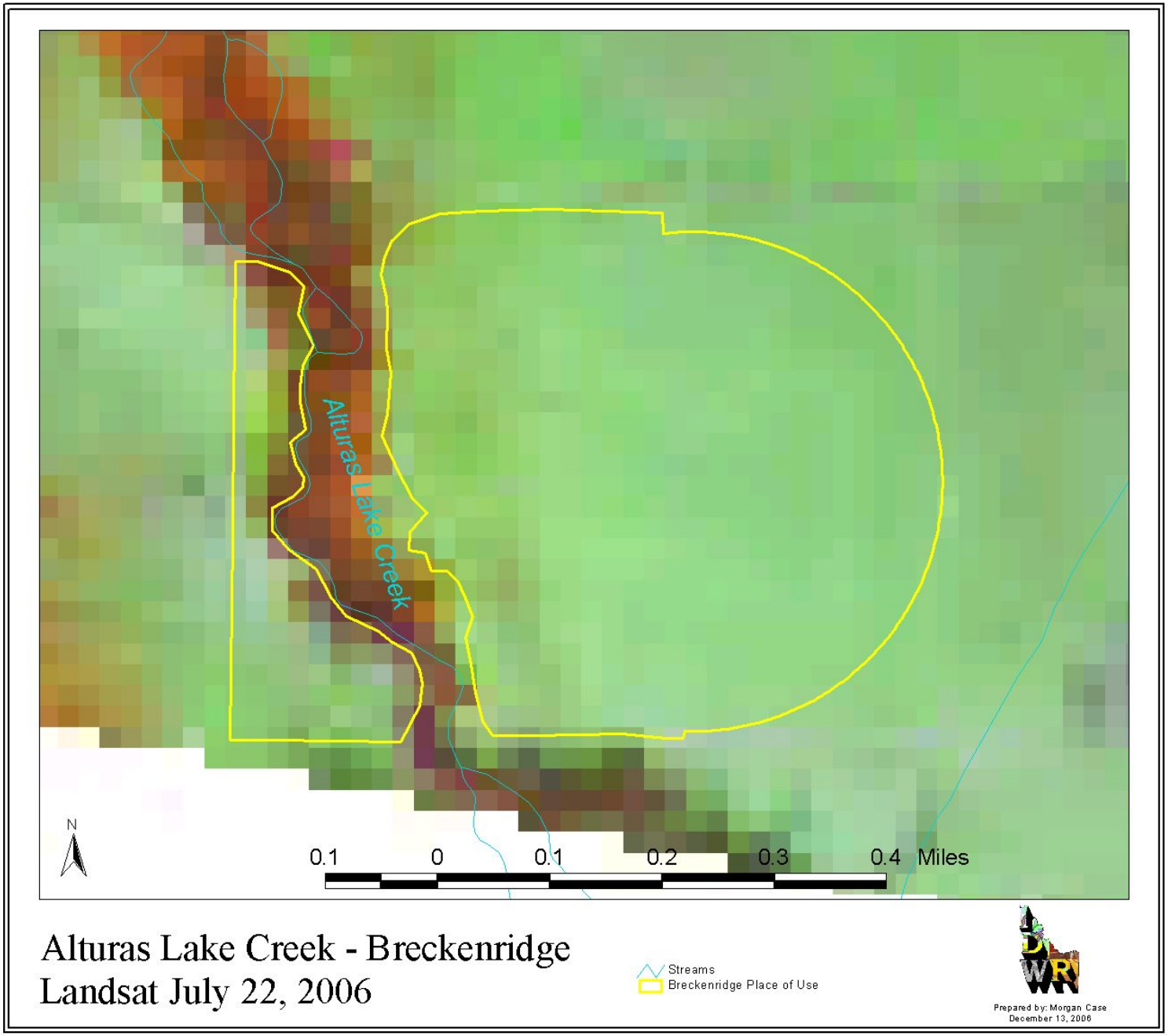
Maret, T.R., Hortness, J.E., and Ott, D.S. 2005. Instream flow characterization of Upper Salmon River Basin streams, central Idaho, 2004. USGS. Scientific Investigation Report 2005-5212.

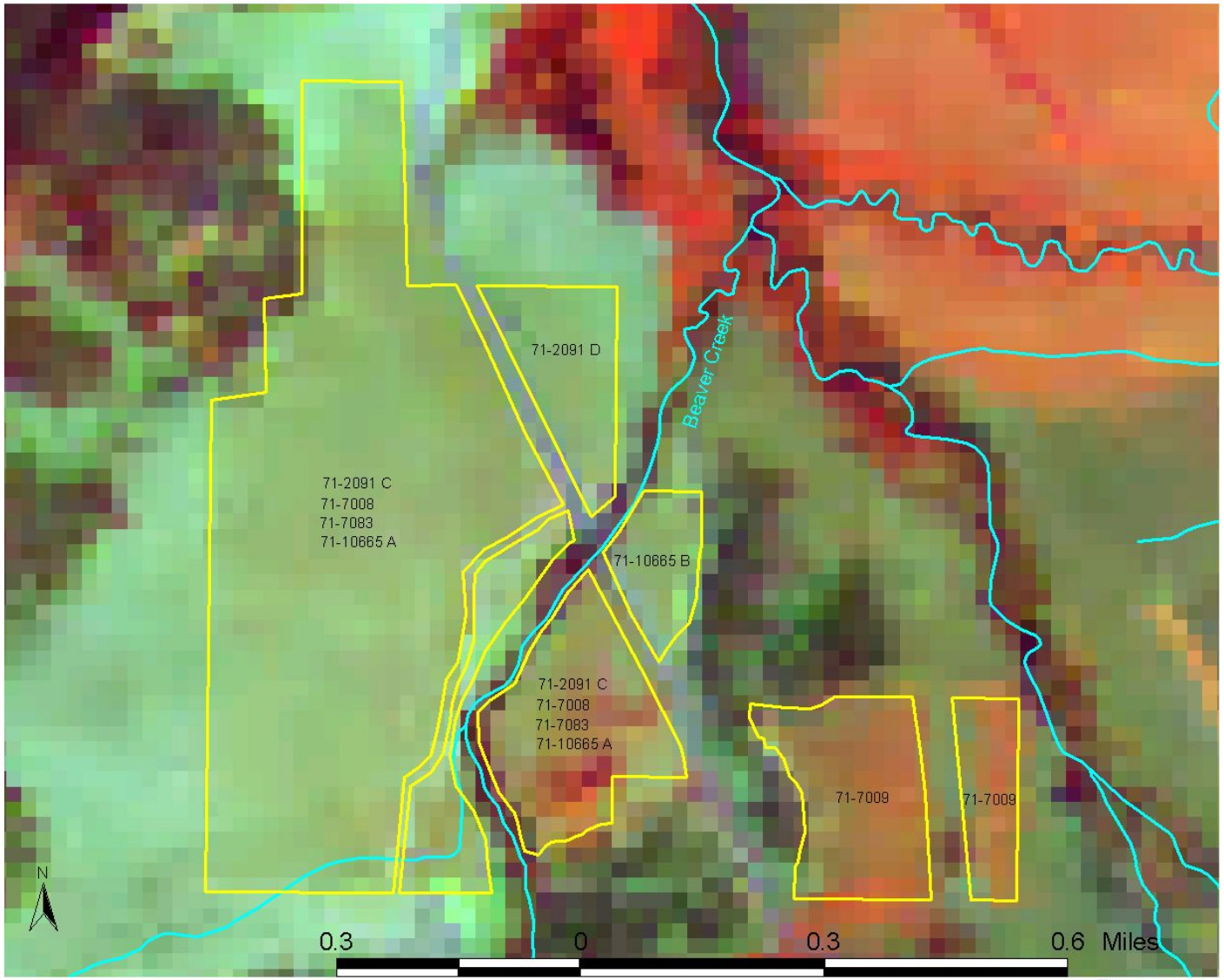
Maret, T.R., Hortness, J.E., and Ott, D.S. 2003. Instream flow characterization of Upper Salmon River Basin streams, central Idaho, 2003. USGS. Scientific Investigation Report 2004-5173.

Murphy, P. 2006. Fisheries Biologist. Idaho Fish and Game Screen Shop. Personal communication.

Trapani, J. 2006. Fisheries Biologist. Bureau of Land Management. Personal communication.

Appendix A
Landsat Images

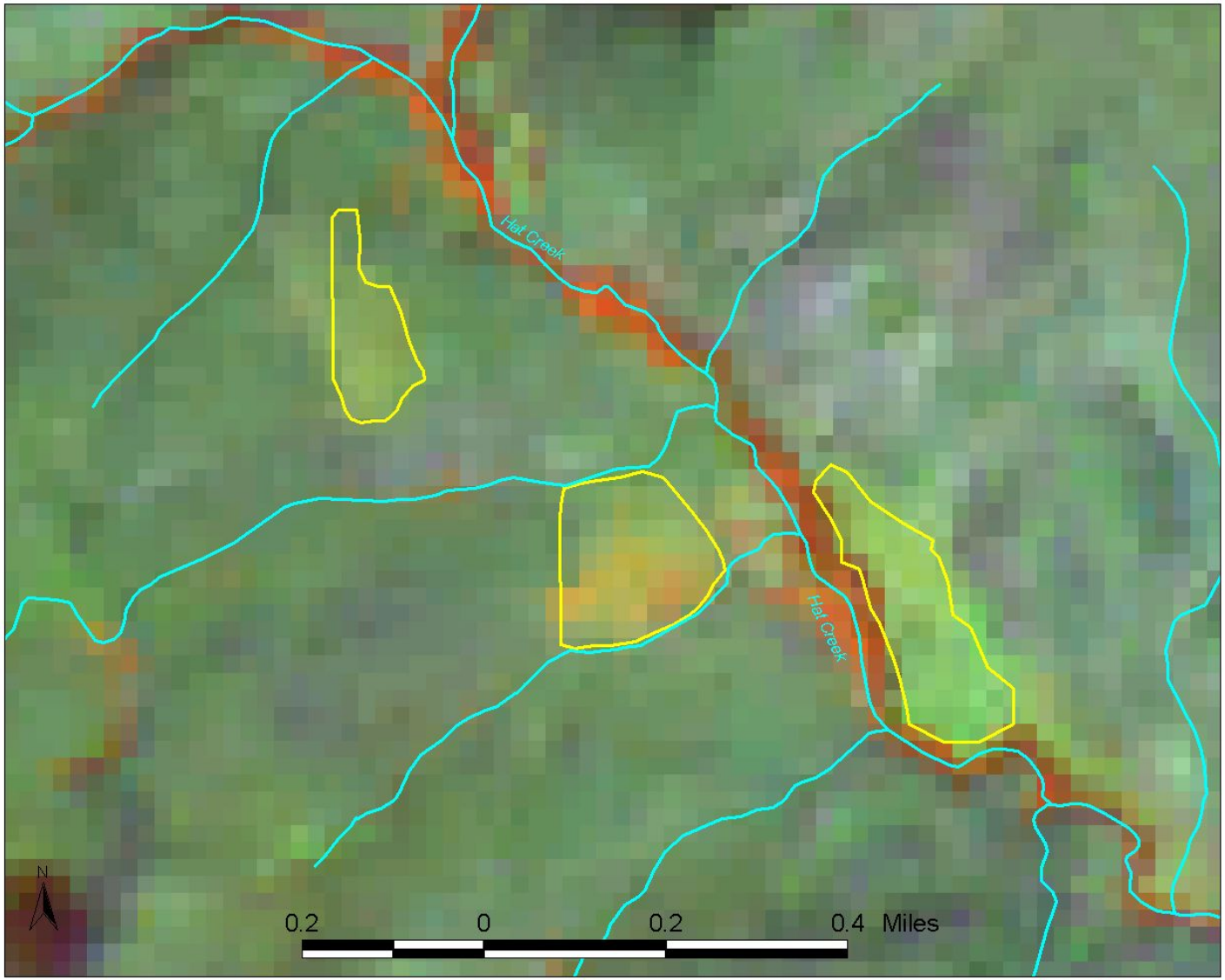

Alturas Lake Creek
N
0.1
0
0.1
0.2
0.3
0.4 Miles
Alturas Lake Creek - Breckenridge
Landsat July 22, 2006
Streams
Breckenridge Place of Use
Prepared by: Morgan Case
December 13, 2006



Beaver Creek - Justus
Landsat June 20, 2006

Justus Place of Use
Streams

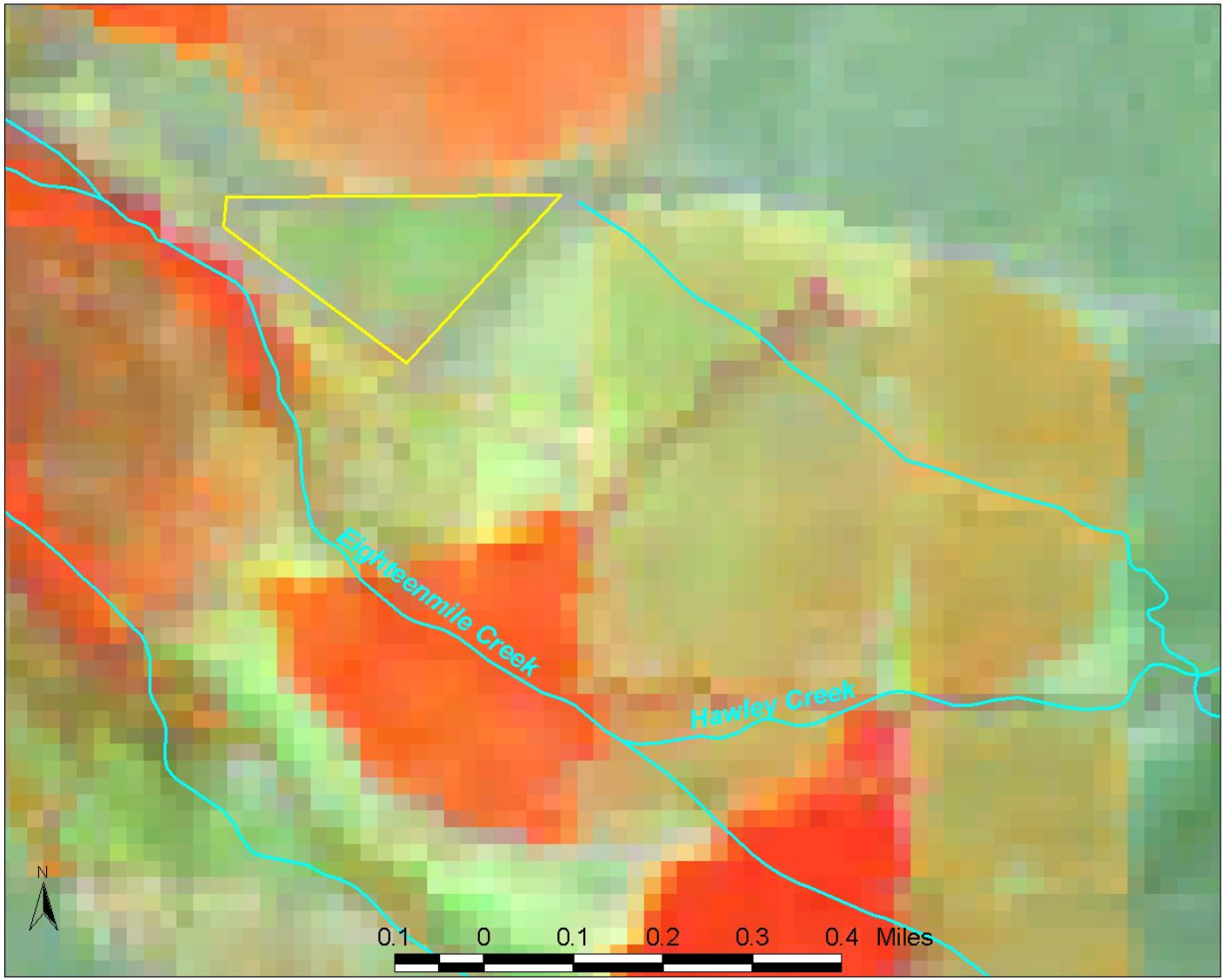
Prepared by: Morgan Case
December 13, 2006



Big Hat Creek - Storlie/Kaiser
Landsat July 22, 2006

Storlie/Kaiser Place of Use
Streams

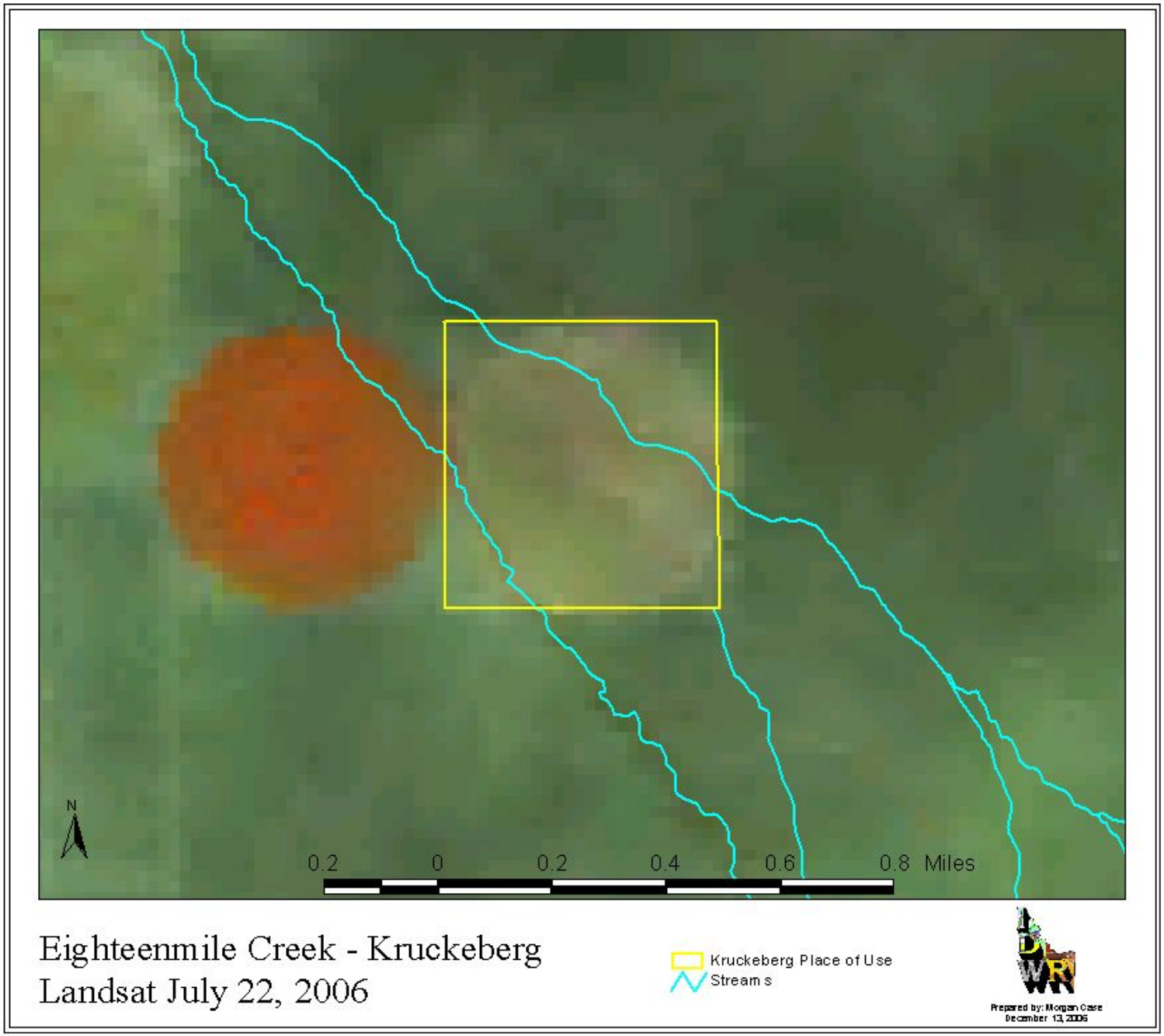
Prepared by: Morgan Case
December 13, 2006

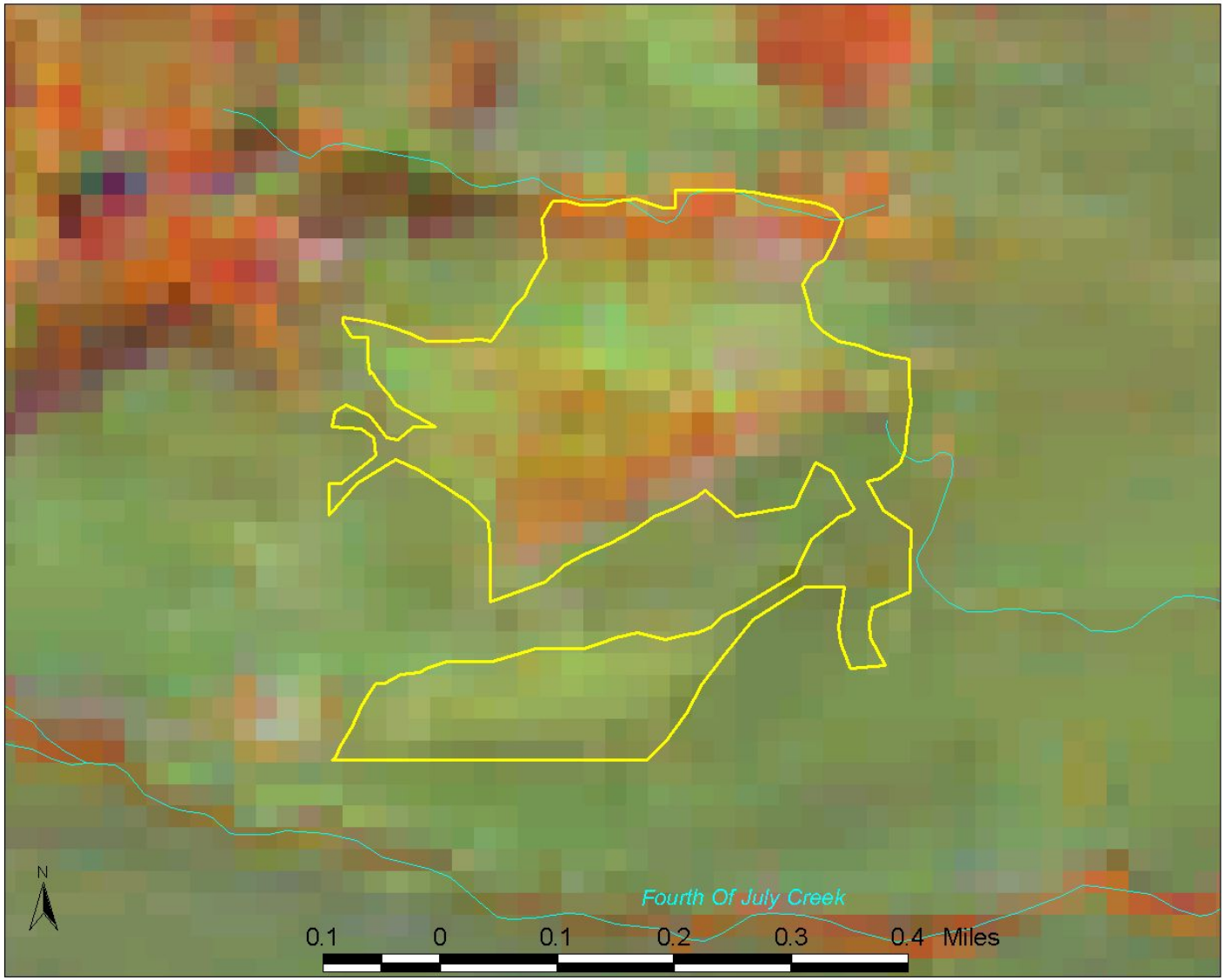


Eighteenmile Creek - Ellsworth
Landsat July 22, 2006

Ellsworth Place of Use
Streams

Prepared by: Morgan Case
December 13, 2006


N
0.2
0
0.2
0.4
0.6
0.8 Miles
Eighteenmile Creek - Kruckeberg
Landsat July 22, 2006
Kruckeberg Place of Use
Streams
Prepared by: Morgan Case
December 13, 2006



Fourth of July Creek - Vanderbilt
Landsat July 22, 2006

Vanderbilt Place of Use
Streams

Prepared by: Morgan Case
December 13, 2006