cutthroat trout spawning, FWP will seek opportunities to work with landowners on practices that will maintain in-stream flow.

6.2.41 Boulder River

The Boulder River (Figure 6-19) originates in the Absaroka and Beartooth mountain ranges in south central Montana and flows north-northeast approximately 60 miles before joining the Yellowstone River in the town of Big Timber. The Boulder River has two major tributaries, the West Boulder River and the East Boulder River, as well as a large number of small tributaries and numerous lakes. The majority of the land on the main Boulder downstream of Natural Bridge Falls is under private ownership. Upstream of the falls, most of the land is within the GNF, with the exception of a number of small in-holdings containing private camps and residences. A large proportion of the GNF is also within the Absaroka-Beartooth Wilderness.

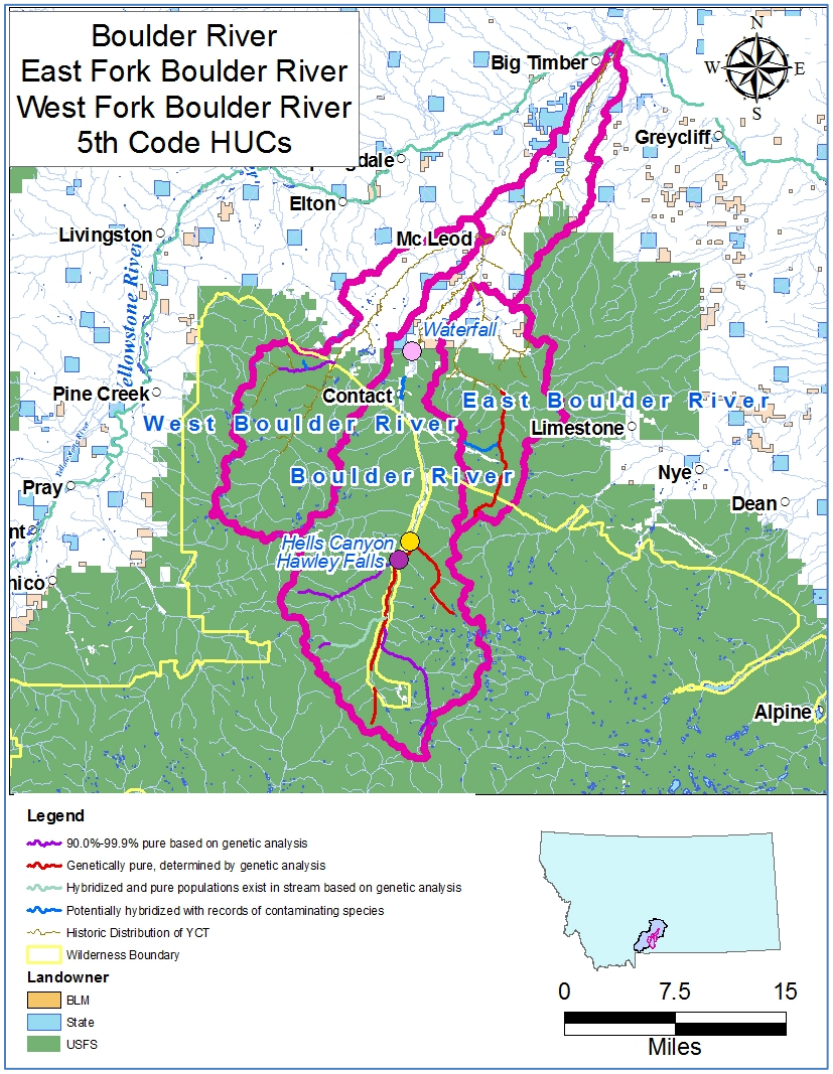

Figure 6-19: Distribution of Yellowstone cutthroat trout in the Boulder River watershed (FWP GIS database).

The Boulder River supports nine species of fish, including nonnative brook trout, rainbow trout, and brown trout (Table 6-43). Fluvial and resident populations of rainbow trout and brown trout use the Boulder River. Brook trout have relatively restricted distribution in the main stem, and are present in about 10 river miles beginning about 37 miles from the mouth. Yellowstone cutthroat trout are limited to the upper reaches of the Boulder River. Other native species include longnose and mountain sucker, longnose dace, mountain whitefish, and mottled sculpin.

Table 6-43: Distribution and abundance of fishes in the Boulder River (MFISH database).

Begin Mile	*End Mile*	*Species*	*Abundance*	*Use Type*	*Genetic Status*	*Data Rating*
37	42	Brook trout	Abundant	Year-round resident	N/A	EFSSO
42	48	Brook trout	Rare	Year-round resident	N/A	EFSSO
0	37	Brown trout	Abundant	Both resident and fluvial populations	N/A	EFMSO
0	23	Longnose dace	Common	Year-round resident	N/A	NSPJ
0	37	Longnose sucker	Abundant	Year-round resident	N/A	NSPJ
0	23	Mottled sculpin	Common	Year-round resident	N/A	NSPJ
0	23	Mountain sucker	Common	Year-round resident	N/A	NSPJ
0	37	Mountain whitefish	Abundant	Year-round resident	N/A	EFMSO
0	50	Rainbow trout	Common	Year-round resident	N/A	EFMSO
52	56	Rainbow trout	Common	Year-round resident	N/A	EFSSO
50	60	Yellowstone cutthroat trout	Rare	Unknown	Nonhybridized	NSPJ
60	65	Yellowstone cutthroat trout	Rare	Unknown	Tested conservation	NSPJ

The historic and current distribution of fish in the Boulder River watershed relates largely to the presence of two waterfalls and introductions of native and nonnative salmonids. From its headwaters downstream to Natural Bridge Falls (Figure 6-19), the Boulder River was historically fishless, as these falls blocked upstream movement of fish. From the falls downstream to the Yellowstone River, the Boulder river historically contained a population of Yellowstone cutthroat trout that moved freely among the Yellowstone, Boulder, East Boulder, and West Boulder rivers. The introduction of nonnative brown, rainbow, and brook trout in this river system has resulted in the extirpation of Yellowstone cutthroat trout in all but a few places in the

East Boulder and West Boulder rivers. Because the lower Boulder River is such a large and interconnected stream system with a popular rainbow and brown trout fishery, few options exist to restore a Yellowstone cutthroat trout population in the main stem of the river below Natural Bridge Falls.

Above Natural Bridge Falls, the Boulder River fishery is a reflection of fish stocking in lakes and streams, with a second waterfall also influencing fish distribution. The presence of brook trout downstream of Hells Canyon, and their absence above the canyon, had led to inference that a passage barrier within the canyon prevented invasion of brook trout. In 2010, biologists confirmed the presence a 12-foot-high waterfall upstream of Hells Canyon between the confluences of Hawley Creek and Fourmile Creek, and referred to it as Hawley Falls (J.R. Wood, FWP, personal communication; Figure 6-20).

Figure 6-20: Hawley Falls on the upper Boulder River.

The area above this waterfall likely presents the best opportunity to establish secure populations of Yellowstone cutthroat trout in the drainage. Currently, populations of nonhybridized Yellowstone cutthroat trout, rainbow trout, and various degrees of hybrid fish exist in this portion of the watershed. In the extreme headwaters, the population of Yellowstone cutthroat

trout is approximately 99% nonhybridized, with progressively increasing rainbow trout hybridization transitioning downstream to Hawley Falls. Between Hawley Falls and Natural Bridge Falls, rainbow trout, brook trout, and hybrids comprise the community, with a few nonhybridized Yellowstone cutthroat trout trickling down from areas upstream. Brown trout are not present upstream of Natural Bridge Falls. Brook trout are in the Boulder River up to Hawley Falls, but none have been found upstream of this barrier (J.R. Wood, FWP, personal communication).

Much of the genetic makeup of the fish in the upper Boulder is likely the result of downstream movement of fish from headwater lakes. Of the 103 lakes occurring in the Boulder River drainage, approximately 36 contain fish. Most of these lakes contain nonhybridized Yellowstone cutthroat trout, with a handful containing rainbow trout and golden trout.

Above Hawley Falls, FWP is collaborating with the GNF forest with the goal of achieving a conservation population of Yellowstone cutthroat trout, with a target of 90% or better genetic status. Actions to achieve this goal include selective removal of rainbow trout from a number of headwater lakes and tributaries that are likely sources of rainbow trout. These efforts began in 2009 and continued through 2012. By combining progressive Yellowstone cutthroat trout restoration projects with natural processes that are contributing to species presence, it may be possible to foster the development of a healthy conservation population of Yellowstone cutthroat trout.

An alternative to mechanical removal and reliance on natural processes to achieve a conservation population would be chemical removal of fish, followed by introduction of nonhybridized Yellowstone cutthroat trout. Several factors limit the feasibility of this alternative. Notably, the scale of this effort would be prohibitive given the amount of stream habitat and number of lakes. Moreover, piscicide projects of this scale require considerable use of motorized equipment to transport material into rugged backcountry, and to mix piscicide into lakes. As all but the Boulder River corridor is within wilderness, obtaining permission to use motorized equipment and piscicide on this scale may be difficult. Moreover, as this portion of the watershed was historically fishless, justification to use motors and piscicide within the wilderness would be less than if the project aimed to protect existing or restore an extirpated population of Yellowstone cutthroat trout.

Extending the conservation area to Natural Bridge Falls may be an option over the long-term; however, several factors present challenges and affect feasibility. The presence of brook trout in the system downstream of Hawley Falls would necessitate the use of chemical removal in establishment of a Yellowstone cutthroat trout conservation area. The extent of stream miles within this portion of the watershed means chemical removal would require considerable effort and expense. Additionally, this portion of the Boulder River supports a popular recreational fishery, and reclamation would temporarily disrupt angling opportunities. Furthermore, all but the Boulder River corridor is within wilderness, which brings wilderness rules into consideration.

The final factor relates to conservation objectives under the Agreement (1.0 Introduction). As this portion of the Boulder River was historically fishless, establishing a Yellowstone cutthroat trout population would relate to the third ranking conservation priority, which entails establishing a population in previously fishless waters. Given the time and expense required to establish a Yellowstone cutthroat trout population in this location, and its lower priority as a previously fishless area, such an effort would rank lower compared to projects securing existing nonhybridized populations or reestablishing populations to where they have been extirpated.

A large number of tributaries contribute to the Boulder River, particularly in its upper reaches. Below are descriptions of the fish populations in streams upstream of the Natural Bridge Falls. Many of the tributaries in the upper part of the drainage are steep and small, and only contain fish near their confluence with the Boulder. Others are much larger, lower gradient streams that contain healthy fish populations. Introduced fish populations in many headwater lakes influence species composition of the tributaries. Mechanical removal of nonnative rainbow trout from these lakes and their tributaries, and restocking with Yellowstone cutthroat trout, would remove the source of rainbow trout alleles.

Boulder River

The portion of the Boulder River (Figure 6-21) with the greatest potential for Yellowstone cutthroat trout conservation is the reach upstream of Hawley Falls. Genetic analyses in 1989 found no evidence of hybridization in the Yellowstone cutthroat trout present in this portion of the Boulder River; however, in 2008, the population was a hybrid swarm with 88.7% of alleles being characteristic of Yellowstone cutthroat trout (Table 6-44). This level of introgression makes this population a sport population. Mechanical removal of rainbow trout and hybrids from lakes, tributaries, and the main stem may result in reduction of the proportion of rainbow trout alleles present in the population, and establishment of a conservation population of Yellowstone cutthroat trout.

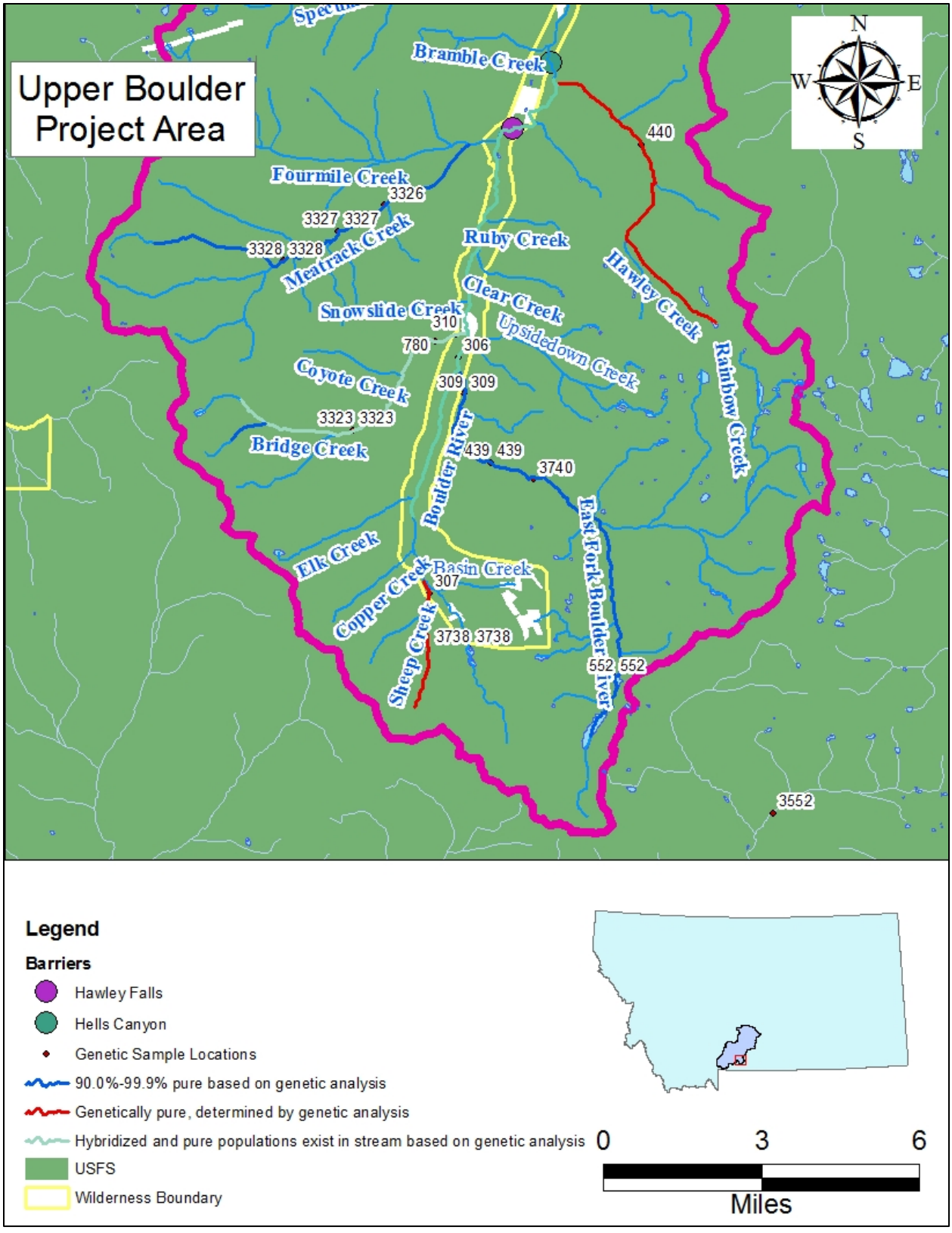

Figure 6-21: Upper Boulder River project area.

Table 6-44: Summary of genetic analyses conducted in the Boulder River watershed (MFISH database).

Stream	*Sample No.*	*Collection Date*	*Sample Size*	*Species Name*	*Percent*	*Count*
Boulder River	306	08/01/1989	24	YCT	100	
Boulder River	3738	07/15/2008	17	YCT	88.7	
Boulder River	3738	07/15/2008	17	RBT	11.3	
Bridge Creek	3323	07/15/2006	20	YCT		19
Bridge Creek	3323	07/15/2006	20	YCT×RBT		1
Bridge Creek	7080	08/01/1993	2	YCT	100.0	
Bridge Creek	310	08/02/1989	25	YCT	98	
Bridge Creek	310	08/02/1989	25	RBT	2	
Davis Creek	3551	07/11/2007	26	YCT	100	
Davis Creek	357	09/26/1989	25	YCT	96.6	
Davis Creek	357	09/26/1989	25	RBT	3.4	
East Boulder River	815	08/19/1993	29	YCT	100	
East Boulder River	430	08/17/1990	26	YCT	100	
East Boulder River	333	08/22/1989	29	YCT	100	
East Fork Boulder River	3739	07/15/2008	32	YCT	99	
East Fork Boulder River	3739	07/15/2008	32	RBT	1	
East Fork Boulder River	3740	07/15/2008	12	YCT×RBT		12
East Fork Boulder River	552	09/11/1991	27	YCT	98.9	
East Fork Boulder River	552	09/11/1991	27	RBT	1.1	
East Fork Boulder River	439	09/06/1990	23	YCT	92.4	
East Fork Boulder River	439	09/06/1990	23	RBT	7.6	
East Fork Boulder River	309	08/02/1989	26	YCT	95.9	
East Fork Boulder River	309	08/02/1989	26	WCT	4.1	
Hawley Creek	440	09/06/1990	2	YCT	100	
Meatrack Creek	3326	07/24/2006	29	YCT	100	
Meatrack Creek	3327	07/24/2006	30	YCT		29
Meatrack Creek	3327	07/24/2006	30	YCT×RBT		1
Meatrack Creek	3328	07/24/2006	30	YCT		26
Meatrack Creek	3328	07/24/2006	30	YCT×RBT		4
Meatrack Creek	3085	08/12/2003	30	YCT	99	
Meatrack Creek	3085	08/12/2003	30	RBT	1	
Sheep Creek	307	08/01/1989	7	YCT	100	
West Boulder River	356	09/21/1989	25	YCT	79.3	
West Boulder River	356	09/21/1989	25	WCT	17.2	
West Boulder River	356	09/21/1989	25	RBT	3	

Basin Creek

Basin Creek (Figure 6-21) is in the extreme headwaters of the Boulder River and enters the Boulder River near the mining ghost town of Independence. Substantial mining activity has taken place in the creek's headwaters. Much of Basin Creek is likely fishless. Because of its small size, short length (around 1.5 miles) and extremely steep gradient, Basin Creek is not a suitable candidate for Yellowstone cutthroat trout introduction.

Sheep Creek

Sheep Creek (Figure 6-21) enters the Boulder River immediately downstream of Basin Creek. The creek contains two forks: main Sheep Creek and the South Fork, which join about 0.75 miles

upstream from the Boulder River. The steep stream gradient near the wilderness boundary limits the potential to support fish. Sampling in 1989 revealed the presence of nonhybridized Yellowstone cutthroat trout, although the small sample size (N=7) limits certainty on the genetic status of this population (Table 6-44). The extent of fish distribution in the drainage is uncertain, but Yellowstone cutthroat trout probably do not extend upstream of the forks. Further investigation will be necessary to describe the extent of fish distribution in the creek and identify potential suitable fish habitat further upstream.

Copper Creek

Copper Creek (Figure 6-21) flows to the northeast until its confluence with the Boulder River, and is the next drainage to the north of Sheep Creek. Fisheries data are lacking for Copper Creek. The creek likely contains Yellowstone cutthroat trout near its mouth, but because of the steep gradient and small drainage area of this 2.5-mile creek, fish probably do not extend far beyond the mouth. Nonetheless, future sampling is warranted to determine fish species composition and fisheries potential.

Elk Creek

Elk Creek (Figure 6-21) originates at Elk Lake and flows about 3.25 miles to where it joins the Boulder River downstream of Copper Creek. Stocking of Elk Lake began in 1936 with introduction of rainbow trout. Because suitable spawning habitat does not exist in Elk Lake, rainbow trout probably did not reproduce there; however, some fish may have moved downstream and populated portions of the Boulder River watershed. A Yellowstone cutthroat trout stocking program began in 1977, and stocking reoccurs on a six-year rotation. Today, Yellowstone cutthroat trout may move downstream from Elk Lake and populate Elk Creek and the Boulder. Although no sampling data are available, fish population densities in Elk Creek are likely low due to the extremely steep gradient, particularly near the wilderness boundary. Further sampling would provide a better characterization of the fishery in Elk Creek.

East Fork Boulder River

The East Fork Boulder River (Figure 6-21) flows for more than 11 miles, much of it through low gradient, high quality habitat before it joins the Boulder River, below the Box Canyon trailhead. Over 20 lakes are present in the East Fork drainage, and 13 of these contain fish. The Yellowstone cutthroat trout population in the East Fork Boulder River is likely a result of fish that were stocked in these headwater lakes. The upper 4 to 6 miles of the East Fork contain Yellowstone cutthroat trout that are greater than 99% nonhybridized (Table 6-44). This population is probably a result of historic downstream movement of fish from Blue Lake, which has been stocked with Yellowstone cutthroat trout on a regular basis since 1965. Several fishless lakes draining into the East Fork have potential to support Yellowstone cutthroat trout if introduced, and include Lamb, Wool, Mutton, Kathleen, and Raymond lakes.

Rainbow Lakes and Mirror Lake

Rainbow Lakes and Mirror Lake are within the Yellowstone cutthroat trout conservation area above Hawley Falls and support nonnative fishes or highly introgressed Yellowstone cutthroat trout. These lakes are a source of rainbow trout and contribute to hybridization in the Boulder River watershed upstream of Hawley Falls. A Yellowstone cutthroat trout conservation effort has been underway since 2011 and will continue through 2013 to achieve core or conservation populations in the lakes and the streams they feed.

The strategy for replacing rainbow trout and hybrid populations in these lakes entails selective removal of rainbow trout through gillnetting and genetic swamping with Yellowstone cutthroat trout. The gillnetting component began in 2011 and continued in 2012. Gillnets were set within these lakes for 1 to 2 weeks, and adult rainbow trout captured in these nets were sunk to keep nutrient cycling within the lakes.

Genetic swamping entails stocking high densities of juvenile Yellowstone cutthroat trout in lakes that contain rainbow trout or hybrids. These young fish will not be susceptible to gillnetting, a least for the first few years. Genetic swamping achieves success through two potential mechanisms. First, the stocked Yellowstone cutthroat trout interbreed with rainbow trout, but through several generations, genetic composition tends toward Yellowstone cutthroat trout as the stocking overwhelms the rainbow trout populations reduced by gillnetting. Alternatively, stocked Yellowstone cutthroat trout may outcompete rainbow trout of the same year class to the extent that Yellowstone cutthroat trout replace an entire year class of rainbow trout.

Stocking Yellowstone cutthroat trout on top of an existing rainbow trout population may appear counterintuitive, especially in light of the role rainbow trout have had in the decline of Yellowstone cutthroat trout, a factor repeated throughout this document. Nonetheless, this method has been successful in Montana and has resulted in elimination or substantial reduction of rainbow trout genes from some lakes. The first mechanism, which entails continued genetic swamping, results in a trend towards more Yellowstone cutthroat trout genes, but may take several decades to be successful. With the second method, intensive gillnetting removes 50 to 75% of the adult rainbow trout in 1 to 2 years, while stocking Yellowstone cutthroat trout at high rates for several years. This section option has been successful in converting a rainbow trout fishery to predominantly Yellowstone cutthroat trout in as little as 4 years (M. Boyer, FWP, personal communication).

Rainbow Creek

Rainbow Creek (Figure 6-21) is a tributary of the East Fork Boulder River, and joins this stream near its midpoint. Rainbow Creek begins in a chain of lakes, and these were the first mountain lakes in Montana to be stocked by airplane, with introduction of rainbow trout in 1932. Currently, all seven of the Rainbow Lakes contain self-sustaining populations of rainbow trout. Nearby Mirror Lake is the only other lake in the drainage that contains rainbow trout. Fish, Chickadee and Burnt Gulch lakes support self-sustaining Yellowstone cutthroat trout

populations. A number of fishless lakes in the drainage have unknown potential to support Yellowstone cutthroat trout if introduced.

Although no official survey data exist for Rainbow Creek, the creek likely supports a population of rainbow trout with some intermixing of Yellowstone cutthroat trout and hybrids. Below the mouth of Rainbow Creek, fish sampled for genetics analysis in the East Fork of the Boulder show much higher levels of hybridization than those upstream of Rainbow Creek (Table 6-44). This finding indicates that Rainbow Creek and Rainbow Lakes are a source of rainbow trout genetics contributing to hybridization further down the drainage. Rainbow Creek is part of the Yellowstone cutthroat trout conservation project that includes gillnetting and genetic swamping in Rainbow Lakes. Chemical removal of the existing fishery will occur by 2013, and Yellowstone cutthroat trout from Rainbow Lakes will populate this stream from the connected lake system.

Upsidedown Creek

Upsidedown Creek (Figure 6-21) is a 5-mile-long tributary to the Boulder River downstream of Rainbow Creek. Horseshoe Lake, near the creek's headwaters, was stocked with Yellowstone cutthroat trout in 1970 and now supports a self-sustaining population. Other lakes in the drainage (Diamond, Upper Hicks, Lower Hicks, and several unnamed lakes) are likely fishless. Diamond Lake was stocked with Yellowstone cutthroat trout in 1970, although no data are available to determine if it supports a self-sustaining population. Sampling near the mouth of Upsidedown Creek in 2003 resulted in the capture of 21 Yellowstone cutthroat trout and one rainbow trout. A potential barrier to upstream fish passage was identified approximately 1/3 mile upstream from the mouth. No fish were captured in a short distance sampled above this barrier. While little is known about the fish population between Horseshoe Lake and the Boulder River, Yellowstone cutthroat trout presumably can move freely downstream from the lake and contribute to the fish population in the Boulder. The creek is likely too steep to support a significant fish population.

Bridge Creek

The 6.5-mile long Bridge Creek (Figure 6-21) begins at Bridge Lake and flows into the Boulder River opposite Upsidedown Creek. Bridge Lake contains a stocked population of Yellowstone cutthroat trout that was originally introduced in 1970 and is supplemented every six years. The creek contains several small tributaries (South Fork, Coyote Creek, Tuscarora Creek, and two unnamed creeks). All but the South Fork Bridge Creek are likely fishless. Several sampling events in the lower reaches of Bridge Creek have identified both nonhybridized and slightly hybridized populations of Yellowstone cutthroat trout. A barrier to upstream fish passage likely keeps rainbow trout from inhabiting the upper reaches of Bridge Creek, but hybridization from rainbow trout is probable in the lower reaches. A population of Yellowstone cutthroat trout is present throughout the creek between Bridge Lake and the Boulder River.

Snowslide Creek

Snowslide Creek (Figure 6-21) is a small stream that joins the Boulder River downstream of Upsidedown Creek. Because of its small size and steep gradient, Snowslide Creek is unlikely to support much of a fishery. No data are available to confirm the status of this stream's fish population.

Clear Creek

This short, steep tributary to the Boulder River (Figure 6-21) likely only contains a few fish near its mouth. Electrofishing surveys in 2003 upstream and downstream of the culvert crossing on the Boulder Road resulted in the capture of only one fish, which appeared to be a Yellowstone cutthroat trout × rainbow trout hybrid (Olsen 2003). Emerald Lake, in the headwaters of Clear Creek, is fishless. Most of the creek is likely too small and steep to support a fish population.

Ruby Creek

Ruby Creek (Figure 6-21) is another short (<1.5 miles), steep tributary to the Boulder River downstream of Clear Creek. Electrofishing surveys in 2003 near the Boulder Road culvert crossing resulted in the capture of three Yellowstone cutthroat trout × rainbow trout hybrids (Olsen 2003). Further upstream, Ruby Creek is likely too small and steep to support a fish population.

Trout Lake

Trout Lake (Figure 6-21) is a 0.9-acre lake near the Boulder River just upstream from the mouth of Fourmile Creek. The lake supports a popular fishery for hatchery-reared catchable Yellowstone cutthroat trout. This recreational fishery for nonhybridized Yellowstone cutthroat trout will be maintained.

Fourmile and Meatrack Creeks

Fourmile Creek (Figure 6-21) is a 7.5-mile-long tributary to the Boulder River. In the upper portion of the basin, the creek originates from three lakes: Silver, Prospect and Patient. Two of these lakes support introduced fish populations. Stocking in Silver Lake began in 1931 with plants of cutthroat trout, followed by stocking of rainbow trout beginning in 1939. Stocking of rainbow trout into Prospect Lake began in 1980. Until recently, both Silver and Prospect supported self-sustaining populations of rainbow trout. A number of small tributaries flow off steep mountain faces and enter Fourmile Creek throughout its length. Except for Trail Creek, none of these streams support significant numbers of fish. Further investigation of Trail Creek is a conservation need that will determine the extent of fish distribution here.

The main stem of Fourmile Creek supports a healthy population of rainbow trout and rainbow × Yellowstone cutthroat trout hybrids throughout most of its length. Electrofishing surveys in 2003 revealed relatively high fish densities in the creek (Olsen 2003). This population likely originated as a result of fish stocking in Silver and Prospect lakes and fish plants in Fourmile Creek from

1932-1944. Upstream movement of fish from the Boulder River is another potential avenue of dispersal; however, a large cascade may be a barrier to upstream invasion by fish.

Meatrack Creek joins Fourmile Creek just upstream of the confluence with the Boulder River. Meatrack Creek supports a healthy fish population, primarily of Yellowstone cutthroat trout, throughout over 8 miles of stream. Meatrack Creek fish are mainly nonhybridized Yellowstone cutthroat trout, but some level of Yellowstone cutthroat trout × rainbow trout hybridization does exist (Table 6-44). This hybridization may be a result of a 1952 stocking of rainbow trout following the 1950 introduction of Yellowstone cutthroat trout.

Downstream of where Fourmile and Meatrack creeks join, but upstream of the Boulder River, a large cascade may prevent upstream movement of fish from the Boulder River. Evaluation to determine whether the cascade is a barrier to fish passage has proven difficult. Several options for Yellowstone cutthroat trout restoration in the upper Boulder drainage revolve around this potential barrier. One option would entail building a permanent structure to ensure that upstream fish passage were completely prevented in the drainage, and subsequently replacing the fish populations from Fourmile and Meatrack creeks with nonhybridized Yellowstone cutthroat trout. This option would ensure additional protected populations of nonhybridized Yellowstone cutthroat trout, but would likely be costly. Another option for Yellowstone cutthroat trout conservation in the drainage would be to replace rainbow trout with Yellowstone cutthroat trout from Fourmile Creek, Silver Lake and Prospect Lake, and assume that upstream movement of rainbow trout and hybrids over the cascade would be minimal, allowing the Yellowstone cutthroat trout population above the cascade to remain a >90% nonhybridized conservation population.

The option that does not entail construction of a barrier is likely the most feasible. Notably, this cascade likely prevents the passage of most fish during most times of the year. Moreover, downstream movement of fish from Fourmile and Meatrack creeks is much more prevalent than upstream movement of fish from the Boulder River. Subsequently, these creeks would be a source of Yellowstone cutthroat trout genetics for the Boulder River, with more Yellowstone cutthroat trout moving downstream and breeding with rainbow trout and hybrids in the main Boulder River. Combined with the removal of rainbow trout from Rainbow Lakes and Rainbow Creek, this action could be the most significant action in increasing the prevalence of Yellowstone cutthroat trout in the upper Boulder River drainage.

Efforts to secure the Fourmile Creek drainage for Yellowstone cutthroat trout began in 2007, and more actions are likely in the next few years. The initial step was mechanical removal of rainbow trout from headwater lakes using intense gillnetting. Gillnetting efforts ceased in 2009, and planting of nonhybridized Yellowstone cutthroat trout followed the next year. Stocking will continue until Yellowstone cutthroat trout establish a self-sustaining population. A waterfall barrier at the outlet of Silver Lake prevents rainbow trout in the creek from colonizing the lake, which protects this investment in fish conservation over the short term. In 2012, Fourmile Creek

and lower Meatrack Creek were treated with piscicide to remove rainbow trout; restocking with nonhybridized Yellowstone cutthroat trout will follow in 2013.

Hawley Creek

Hawley Creek (Figure 6-21) is a 6.5-mile long tributary that enters the Boulder River upstream of Hells Canyon, but downstream of Hawley Falls. The creek is exceptionally steep in its lower reaches, which likely limits its ability to provide fish habitat, and prevents upstream fish passage. The only fisheries data for Hawley Creek is a genetic investigation in 1990 that identified two nonhybridized Yellowstone cutthroat trout (Table 6-44). Two lakes stocked with Yellowstone cutthroat trout, Squeeze and Narrow Escape, are the likely source of Yellowstone cutthroat trout in the creek. No survey data are available to characterize the abundance and distribution of this population, but it likely serves as a source of Yellowstone cutthroat trout moving downstream into the Boulder River. Two other lakes in the drainage, Hawley Lake and Helicopter Lake, are fishless but may be capable of supporting Yellowstone cutthroat trout.

Bramble Creek

Bramble Creek (Figure 6-21) is a steep, 3-mile-long tributary to the Boulder below Hells Canyon. Three lakes in the headwaters of the creek support introduced Yellowstone cutthroat trout populations. The creek is almost certainly too small and steep to support a Yellowstone cutthroat trout population. No fish were captured during electrofishing sampling near the mouth of the creek in 2003 (Olsen 2003).

Speculator Creek

The 8-mile long Speculator Creek (Figure 6-22) begins at Speculator Lake and enters the Boulder River just downstream of a private camp. The creek is steep near its mouth, and upstream fish movement is not possible beyond a short distance from the Boulder River. The creek was stocked with rainbow trout in 1943, and cutthroat trout in 1950. Both times, fish were planted near the confluence with the Boulder River. Several rainbow trout were caught during electrofishing sampling near the mouth of the creek in 2003 (Olsen 2003). Speculator Lake was stocked with Yellowstone cutthroat trout beginning in 1976. As is common in these systems, Yellowstone cutthroat trout have likely moved downstream out of the lake and colonized the creek. Due to its size and relatively low gradient, Speculator Creek likely supports a Yellowstone cutthroat trout population throughout much of its length. Collection of fish survey data is a conservation priority for Speculator Creek. The results will inform development of a specific strategy for Yellowstone cutthroat trout conservation as warranted.