

Soon after entering private lands, an irrigation system intercepts Piney Creek's flows, and water occupies its historic channel only during spring run-off or storm events. The irrigation system presents a sink for Yellowstone cutthroat trout in Piney Creek, as fish entering the canals are lost. Livestock use of the riparian area has potential to reduce habitat quality and trample redds in the small amount of available spawning habitat. Pool habitat and areas with spawning gravels are also limited, which affects carrying capacity and recruitment of Yellowstone cutthroat trout.

Several actions have contributed to conservation of Piney Creek's Yellowstone cutthroat trout population. In 2010, modification of the downstream diversions established a means to continue delivery of water to water rights holders, while impeding entrainment of Yellowstone cutthroat trout. This project involved impounding the lower end of the fish-bearing portion of Piney Creek into an existing depression. Instead of culverts set at grade, installation of three screened standpipes allowed for delivery of water to irrigation ditches and the historic channel. The pond provides low-water refugia for Yellowstone cutthroat trout, and the standpipes discourage entrainment of juvenile and adult Yellowstone cutthroat trout. Young fish will be unlikely to venture into the water column and will not encounter the standpipes. The screens will prevent older fish from being entrained.

Habitat improvements have also been a part of conservation actions in Piney Creek. Riparian fencing and off-channel stock tanks now reduce the pressure exerted by livestock on the stream. Installation of rock and log structure promote scour of pools and allow for sorting of gravels to improve the availability and quality of spawning habitat.

Small population size and isolation continue as substantial risks to Piney Creek's Yellowstone cutthroat trout population. FWP will monitor the population and its genetic status.

Reintroduction may be necessary in the event disturbance eliminates this small population.

Likewise, supplementing the population may be warranted if inbreeding depression results in genetic risks.

6.10.3 Bear Creek

Bear Creek (Figure 6-45) is a tributary of Sage Creek that likely supported Yellowstone cutthroat trout historically. Its headwaters originate in the Pryor Mountains, and it flows through CNF lands, BLM lands, and private lands until its confluence with Sage Creek. No fisheries data are available for Bear Creek. Future efforts should include fish surveys and determination of Bear Creek's potential to support reintroduction of Yellowstone cutthroat trout.

6.11 Lower Bighorn Subbasin (HUC 10080015)

The lower Bighorn River hydrologic (Figure 6-46) unit begins at Yellowtail Dam, and encompasses the area contributing to the Bighorn River until its confluence with the Yellowstone River. The upstream portions of the watershed are within the Crow Reservation, and the downstream two thirds of the basin are on primarily private lands. Land uses include livestock grazing and irrigated crop production.

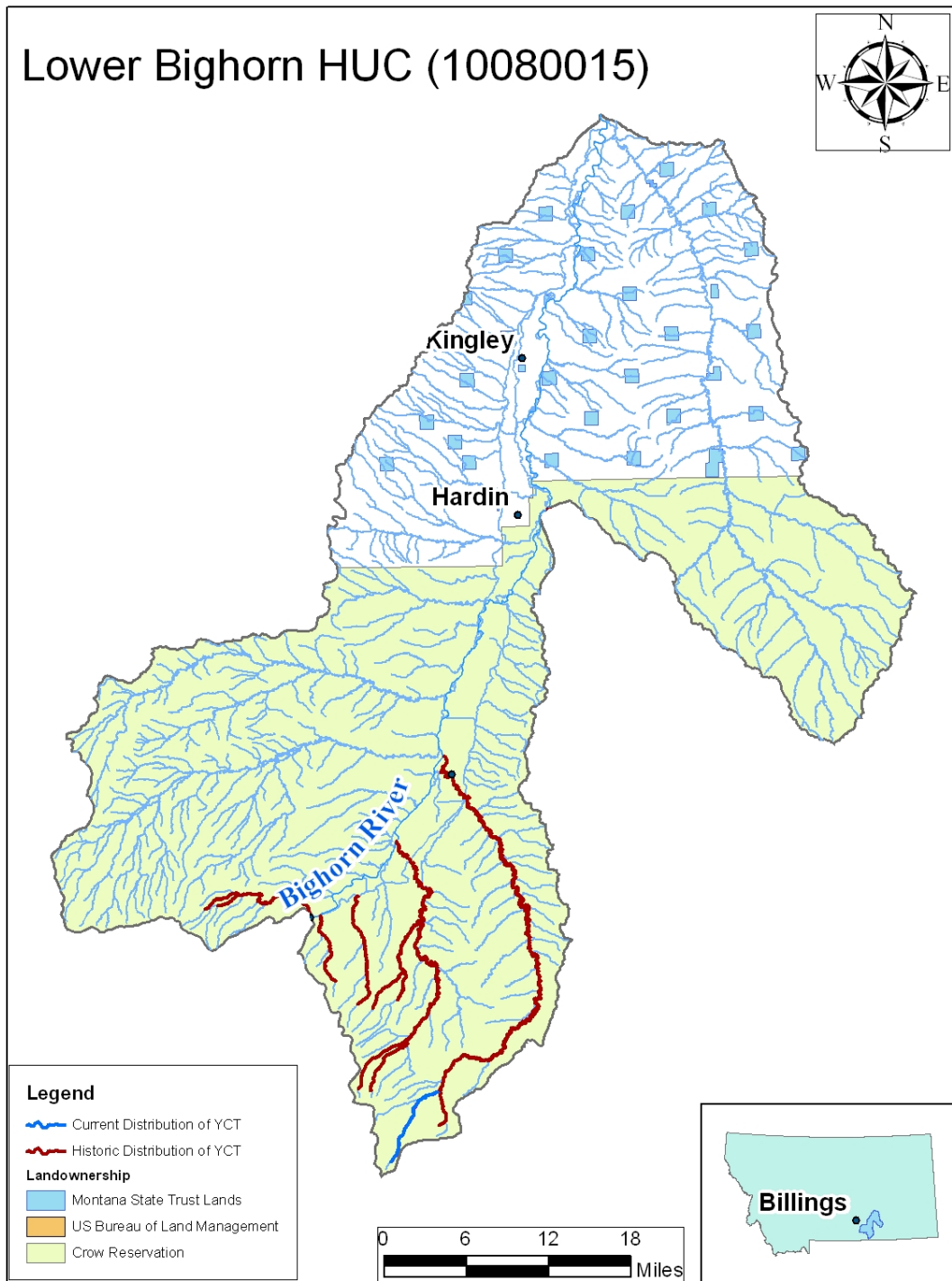


Figure 6-46: Lower Bighorn River Subbasin (HUC 100810015).

The Lower Bighorn River Subbasin provides habitat to warm-water and cold-water fish assemblages. Streams with headwaters in the Bighorn Mountains have potential to support cold-

water fisheries, and Yellowstone cutthroat trout occupied these streams historically. Otherwise, streams support warm-water fish assemblages composed mostly of native prairie species (Table 6-63).

Table 6-63: Distribution and abundance of fishes rating as common or abundant in the Bighorn River (MFISH database).

<i>Begin Mile</i>	<i>End Mile</i>	<i>Species</i>	<i>Abundance</i>	<i>Data rating</i>
42	53	Brown trout	Common	EFMSO
53	84	Brown trout	Abundant	EFMSO
0	53	Burbot	Common	EFSSO
0	50	Channel catfish	Common	EFMSO
0	85	Common carp	Common	EFMSO
0	42	Flathead chub	Common	EFSSO
0	53	Goldeye	Abundant	EFMSO
53	66	Goldeye	Common	EFMSO
0	53	Longnose dace	Common	NSPJ
53	84	Longnose dace	Abundant	NSPJ
0	84	Longnose sucker	Abundant	EFMSO
0	53	Mountain sucker	Common	EFSSO
42	53	Mountain whitefish	Common	EFMSO
53	84	Mountain whitefish	Common	EFMSO
0	53	Rainbow trout	Common	EFMSO
53	84	Rainbow trout	Abundant	EFMSO
0	53	River carpsucker	Common	EFSSO
0	53	Shorthead redhorse	Common	EFMSO
0	42	Western silvery/plains minnow	Common	NSPJ
0	84	White sucker	Abundant	EFMSO

Completion of Yellowtail Dam altered the fisheries potential in this portion of the Bighorn River. Historically, this river supported a warm-water assemblage of riverine species. The hypolimnetic release of cold, clear nutrient-rich water now supports a popular tailwater fishery for rainbow and brown trout for 21 miles, with trout found throughout and often abundant for over 40 miles downstream of the dam. The Bighorn River then reverts to a warm-water prairie river. The abundance of brown trout and rainbow trout downstream of Yellowtail Dam means any Yellowstone cutthroat trout restoration in adjacent tributaries would require construction of barriers to prevent invasion of the nonnative fishes.

6.11.1 Rotten Grass Creek

Rotten Grass (Figure 6-47) emerges from numerous springs on the northern slope of the Bighorn Mountains on the Crow Reservation. The stream flows to the north for about 70 miles through a mixture of tribal, allotted, and private lands until its confluence with the Bighorn River near Saint Xavier.

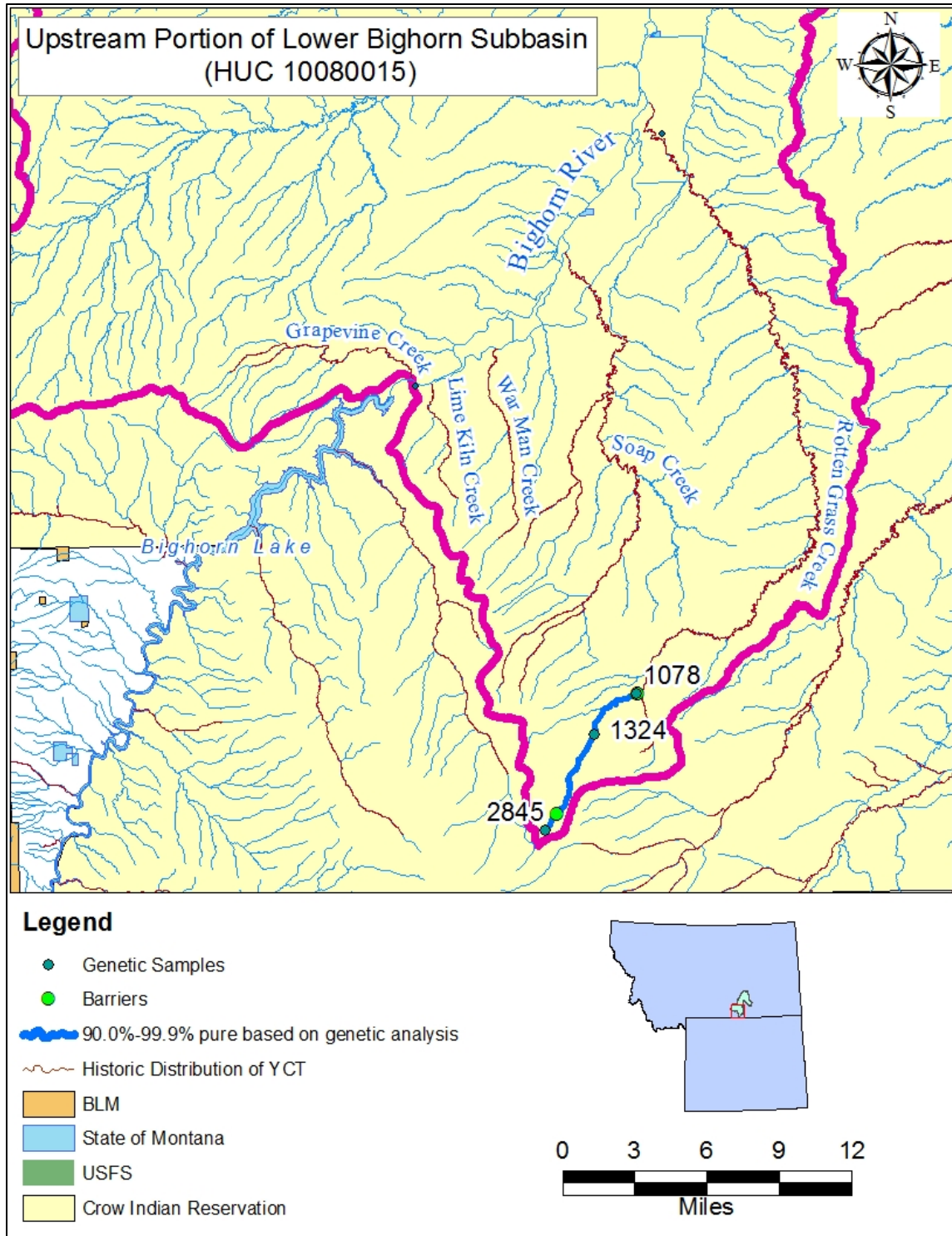


Figure 6-47: Portions of the lower Bighorn River watershed supporting cold-water fisheries.

Fish community composition varies along the length of Rotten Grass Creek (Table 6-64). The lower 60 miles of stream supports a warm-water assemblage of mostly native prairie species. Historically, Yellowstone cutthroat trout were present in the upper 20 miles of Rotten Grass

Creek, but are now relegated to the upper 9 miles above a natural barrier. These fish are slightly introgressed (Table 6-65) with westslope cutthroat trout genes originating from a fish car-stocking event in 1917. This slightly introgressed population is managed as a conservation population.

Table 6-64: Distribution and abundance of fishes in Rotten Grass Creek (MFISH database).

<i>Begin Mile</i>	<i>End Mile</i>	<i>Species</i>	<i>Abundance</i>	<i>Data Rating</i>
16	17	Fathead minnow	Unknown	EFSSO
16	17	Lake chub	Rare	EFSSO
0	75	Longnose dace	Common	EFSSO
0	75	Longnose sucker	Common	NSPJ
0	75	White sucker	Common	EFSSO
67	74	Yellowstone cutthroat trout	Common	NSPJ

Table 6-65: Summary of genetic analyses conducted in Rotten Grass Creek (MFISH database).

<i>Sample No.</i>	<i>Sample Size</i>	<i>Target Species</i>	<i>Percent of Genes</i>	<i>Collection Date</i>
2845	29	YCT	98	06/21/2000
2845	29	WCT	2	06/21/2000
1324	16	YCT	99	10/29/1998
1324	16	WCT	1	10/29/1998
1078	10	YCT	100	08/20/1995

Habitat impairment presents a constraint on Rotten Grass Creek’s ability to support a healthy Yellowstone cutthroat trout population. Current livestock grazing practices have adverse effects on riparian health and function, bank stability, and stream morphology. Irrigation withdrawals result in chronic dewatering in the stream’s lower reaches. Implementing agricultural BMPs that are compatible with livestock production and Yellowstone cutthroat trout conservation would be beneficial to this isolated population of cutthroat trout.

6.11.2 Soap Creek

Soap Creek (Figure 6-47) emerges from two springs at the base of the north slope of the Bighorn Mountains on the Crow Reservation. The stream flows to the north for approximately 30 miles through a mixture of tribal, allotted, and private lands before its confluence with the Bighorn River.

Historically, Yellowstone cutthroat trout occupied the upper 15 miles of Soap Creek, but are no longer present. The existing fishery is a mixture of native minnows and suckers, and introduced brown trout, rainbow trout, and brook trout (Table 6-66).

Table 6-66: Distribution and abundance of fishes in Soap Creek (MFISH database).

<i>Begin Mile</i>	<i>End Mile</i>	<i>Species</i>	<i>Abundance</i>	<i>Use Type</i>	<i>Data Rating</i>
0	38	Brook trout	Rare	Year-round resident	NSPJ
0	38	Brown trout	Common	Year-round resident	NSPJ
0	38	Fathead minnow	Common	Year-round resident	NSPJ
0	38	Lake chub	Rare	Year-round resident	NSPJ
0	38	Longnose dace	Common	Year-round resident	NSPJ
0	38	Longnose sucker	Common	Year-round resident	NSPJ
0	38	Mountain sucker	Common	Year-round resident	NSPJ
0	38	Rainbow trout	Common	Year-round resident	NSPJ
0	38	Shorthead redhorse	Rare	Year-round resident	NSPJ
0	38	White sucker	Common	Year-round resident	NSPJ

Potential conservation actions for Soap Creek include reintroduction of Yellowstone cutthroat trout, and implementation of grazing BMPs to restore stream health. Reestablishment of a Yellowstone cutthroat trout population would require removal of the existing nonnative species occupying this stream and construction of a barrier to prevent reinvasion by nonnatives in the neighboring Bighorn River. Future investigations should focus on identification of potential barrier sites.

6.11.3 War Man Creek

War Man Creek (Figure 6-47) is a small stream originating from springs on the northern slopes of the Bighorn Mountains and flowing to the north for about 13 miles until its confluence with the Bighorn River. Landownership is a mixture of tribal, allotted, and private lands. Currently, the Bighorn Canal captures the entire flow of War Man Creek about one mile from its confluence with the river.

Little information is available on fish distribution or fisheries potential of War Man Creek. Presumably, Yellowstone cutthroat trout occupied the entire stream, although extirpation is likely. The habitat available for support of cold-water fishes is probably limited to the upper 3.5 miles of stream. Current livestock grazing practices are incompatible with fisheries needs, which present another constraint on the potential of the fishery.

The conservation strategy for War Man Creek is to conduct field surveys to determine the potential for reestablishment of a Yellowstone cutthroat trout population. Factors needing consideration include the potential for the Bighorn Canal to be a source of nonnatives, and potential for sufficient stream habitat to be present with improvements in grazing management. If only 3.5 miles of the stream has potential for reintroduction, this project would be a relatively low priority compared to projects that would afford a greater extent of occupiable habitat.

6.11.4 Lime Kiln Creek

Lime Kiln Creek (Figure 6-47) is a small stream that enters the Bighorn River just below Yellowtail Dam. No data are available to describe the fishery or its potential. If this stream does support a fishery, species present likely reflect those present in the adjacent Bighorn River, which include nonnative rainbow and brown trout. Determining the potential for Lime Kiln Creek to provide sufficient habitat of suitable quality and identification of a potential barrier site are data needs.

6.11.5 Grapevine Creek

Grapevine Creek (Figure 6-47) is an 8-mile long tributary of the Bighorn River that joins the river downstream of Yellowtail Dam. No data are available to evaluate its current fishery or potential. Baseline surveys are necessary to determine if reestablishment of Yellowstone cutthroat trout is possible in Grapevine Creek.

6.12 Little Bighorn Subbasin (HUC 10080016)

The Little Bighorn HUC (Table 6-67) originates in Wyoming, but most of its area is in Montana. The Montana portion of the watershed is entirely within the Crow Reservation. Livestock grazing and irrigated crop production are the primary land uses.