historic range was likely marginal habitat for Yellowstone cutthroat trout, as the river and its tributaries are transitional between cold-water and warm-water systems in this subbasin. The distribution of representative cold-water and warm-water fishes illustrates this transitional character. Rainbow trout are the only cold-water species rating as common in this portion of the Yellowstone River (MFISH database). Brown trout and mountain whitefish are rare, and Yellowstone cutthroat trout are not present. In contrast, warm-water fishes, such as channel catfish, goldeye, flathead chub, and river carpsucker are common to abundant within the subbasin (MFISH database).

As this portion of the Yellowstone cutthroat trout's historic range is marginal for cold-water fisheries, restoring Yellowstone cutthroat trout to this area faces natural impediments. Improvements in the reaches upstream may result in increased representation of Yellowstone cutthroat trout in this reach, especially during colder seasons. Specific actions to restore Yellowstone cutthroat trout to the Upper Yellowstone-Pompey's Pillar HUC would be low priority compared to portions of its historic range.

6.8 Pryor Creek Subbasin (HUC 10070008)

The Pryor Creek hydrological unit (Figure 6-41) lies to the east of Billings, and is mostly within the Crow Reservation. Originating in the Pryor Mountains, Pryor Creek flows north for over 100 miles until its confluence with the Yellowstone River near Huntley. Most of the basin's streams flow through prairie, and only the extreme headwaters are within montane or foothills environments.

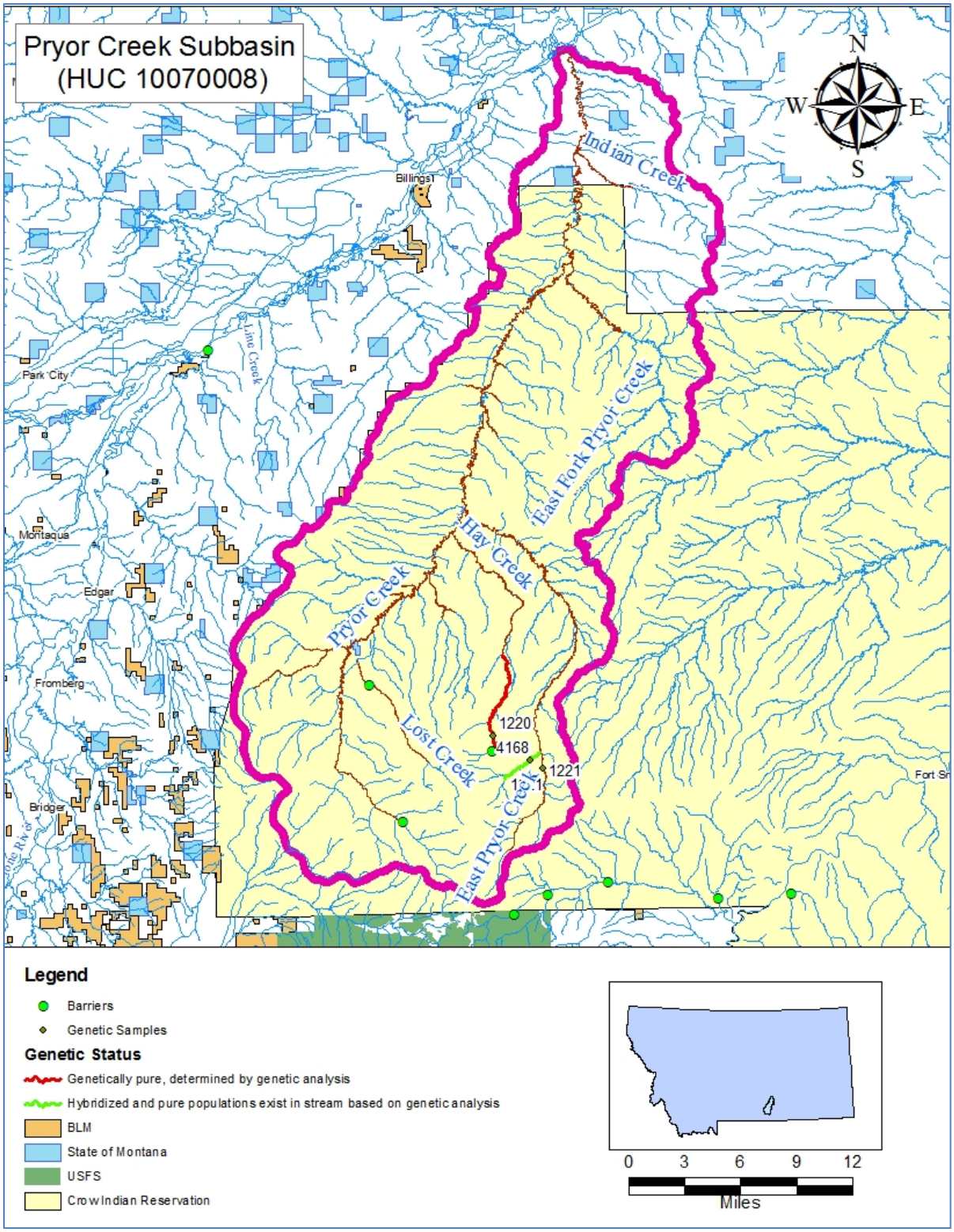

Figure 6-41: Pryor Creek Subbasin (HUC 10070008).

Land uses in the basin are typical of the region. The upper, montane portions support timber harvest and livestock grazing. Agriculture is the primary activity in the lower elevations, and

includes livestock grazing and irrigated crop production. Irrigation withdrawals have a substantial influence on stream flow. FWP includes the lower 21 miles of Pryor Creek on its lists of dewatered streams.

Fisheries potential varies along a longitudinal gradient. The lower 60 miles of Pryor Creek supports a warm-water fishery with native prairie species such as minnows and suckers being the most abundant taxa (Table 6-59). The fishery transitions to cold-water species higher in the watershed, and includes nonnative brook trout, rainbow trout, and Yellowstone cutthroat trout.

Table 6-59: Distribution and abundance of fishes in Pryor Creek (MFISH database).

Begin Mile	*End Mile*	*Species*	*Abundance*	*Use Type*	*Data rating*
13	15	Black bullhead	Unknown	Unknown	EFSSO
15	16	Black bullhead	Unknown	Unknown	EFSSO
78	81	Brook trout	Rare	Year-round resident	NSPJ
81	101	Brook trout	Common	Year-round resident	NSPJ
0	27	Channel catfish	Rare	Year-round resident	EFMSO
0	02	Common carp	Rare	Year-round resident	EFSSO
13	14	Common carp	Unknown	Year-round resident	EFMSO
0	016	Fathead minnow	Rare	Year-round resident	EFMSO
0	026	Flathead chub	Common	Year-round resident	EFMSO
26	62	Flathead chub	Abundant	Year-round resident	EFMSO
0	62	Longnose dace	Rare	Year-round resident	EFMSO
62	81	Longnose dace	Rare	Year-round resident	EFMSO
13	16	Longnose sucker	Unknown	Year-round resident	EFMSO
0	13	Mountain sucker	Abundant	Year-round resident	EFMSO
13	16	Mountain sucker	Common	Year-round resident	EFMSO
62	78	Mountain sucker	Common	Year-round resident	EFMSO
62	101	Rainbow trout	Rare	Year-round resident	NSPJ
0	2	Sand shiner	Unknown	Unknown	EFMSO
13	15	Sand shiner	Unknown	Unknown	EFMSO
0	13	Shorthead redhorse	Abundant	Year-round resident	EFMSO
13	62	Shorthead redhorse	Rare	Year-round resident	EFMSO
0	26	Stonecat	Rare	Year-round resident	EFMSO
0	14	Western silvery minnow	Common	Year-round resident	EFMSO
0	26	Western silvery/plains minnow	Rare	Year-round resident	NSPJ
26	27	Western silvery/plains minnow	Common	Year-round resident	NSPJ
27	62	Western silvery/plains minnow	Rare	Year-round resident	NSPJ
0	27	White sucker	Abundant	Year-round resident	EFMSO
27	62	White sucker	Common	Year-round resident	EFMSO
62	78	White sucker	Common	Year-round resident	EFMSO

Historically, Yellowstone cutthroat trout occurred throughout the Pryor Creek drainage with the possible exclusion of a few streams. Indian Creek and East Fork Pryor Creek provide habitat suitable for warm-water species, so occupancy by Yellowstone cutthroat trout may have been

incidental. A natural barrier on Lock Creek likely blocked upstream movement of Yellowstone cutthroat trout.

Currently, Yellowstone cutthroat trout are restricted to Hay and Shively creeks. In the mid-1990s, nonhybridized Yellowstone cutthroat trout in were present in Hay Creek, and both nonhybridized and introgressed Yellowstone cutthroat in Shively Creek (Table 6-60). Updating information on the genetic status of these populations is a data need. Currently Hay Creek is the only conservation population in the Pryor Creek drainage.

Table 6-60: Summary of genetic analyses conducted for streams in the Pryor Creek watershed (MFISH database). .

Stream	*Sample No.*	*Sample Size*	*Target Species*	*Percent of YCT Genes*	*Number of Fish*	*Collection Date*
Hay Creek	1220	12	YCT	100		7/10/1996
East Pryor Creek	1221		YCT	76.3		7/10/1996
Shively Creek	4168	12	YCT×RBT×WCT		10	7/11/1996
Shively Creek	4168	12	YCT×RBT		2	7/11/1996

As the habitat suitable for support of cold-water fisheries is within the Crow Reservation, the Crow Tribe would be the principal partner in restoration efforts. State and federal agencies, along with nonprofit groups, would be probable collaborators should Yellowstone cutthroat trout conservation projects proceed. Future actions should include additional survey to determine the distribution and abundance of trout and identification of potential sites to construct barriers to protect existing or restored Yellowstone cutthroat trout populations.

6.8.1 Pryor Creek

Pryor Creek (Figure 6-41) originates from numerous springs on the north and east slopes of the Pryor Mountains of the Crow Reservation and flows for just over 100 miles before its confluence with the Yellowstone River at Huntley. Landownership is a mixture of tribal, allotted and private lands. Pryor Creek's tributaries include Indian Creek, East Fork Pryor Creek, East Pryor Creek, Hay Creek and Lost Creek. Chronic dewatering relating to agricultural practices occurs in the lowest portions of Pryor Creek and to a lesser extent in lower Lost Creek, while natural flow regimes provide seasonal connections between Pryor Creek and the tributaries Hay and East Pryor creeks.

Habitat suitable for support of cold-water fisheries is limited to the upper watershed. Currently, the main stem supports brook trout and rainbow trout, and restoration of Yellowstone cutthroat trout in this portion of Pryor Creek would require removal of the nonnatives.

Several factors need consideration in determining the feasibility of reclaiming upper Pryor Creek for native cutthroat trout. Preventing reinvasion of rainbow trout is a concern. Currently, an irrigation diversion near the mouth of Pryor Creek blocks upstream movement of fish; however,

providing passage for warm-water species is a potential future project that may allow rainbow trout access to Pryor Creek. Nonetheless, the long expanse of warm-water, prairie stream habitat may be a natural barrier to upstream movement of rainbow trout, although rainbow trout may eventually invade the upper reaches. Construction of a barrier is an option to protect the trout-bearing portions of Pryor Creek, and field surveys of potential barrier sites are needed.

The extreme headwaters of Pryor Creek originate in limestone caves, which pose difficulties in applying piscicide to reclaim the stream for native trout. The extent of trout-bearing water within these caves is unknown. Investigation into the potential for the caves to provide refuge to nonnative fishes, and development of an approach to treat these waters is a subject requiring additional investigation.

6.8.2 East Fork Pryor Creek

East Fork Pryor Creek (Figure 6-41) is a major tributary that joins Pryor Creek about 27 miles from its confluence with the Yellowstone River. The lower portions of East Fork Pryor Creek may have supported Yellowstone cutthroat trout historically, although they are unlikely to be present currently. Fisheries data are lacking for East Fork Pryor Creek. Conservation actions should include surveys to determine species composition and potential for this stream to support Yellowstone cutthroat trout.

6.8.3 East Pryor Creek

East Pryor Creek (Figure 6-41) originates on the northeast face of the Pryor Mountains and flows northwesterly for nearly 40 miles across a mixture of tribal, allotted and private lands before entering Pryor Creek. Trout are limited to about 7 miles of East Pryor Creek in its upper reaches. These trout are an introgressed mixture of Yellowstone cutthroat, westslope cutthroat and rainbow trout; the westslope cutthroat trout resulting from a 1917 fish-car stocking originating from Somers Fish Hatchery on Flathead Lake.

Restoration of a core population of Yellowstone cutthroat trout would require removal of the existing introgressed fishery. As with Pryor Creek, consideration of the potential for reinvasion is necessary in determining a specific approach. The warm-water reaches dominated by native prairie fish species may not provide a suitable migration corridor for rainbow trout in the Yellowstone River, and may prevent reinvasion. Nonetheless, rainbow trout may eventually move through this unsuitable habitat; therefore, construction of a barrier may be the preferred option in securing a restored population.

6.8.4 Shively Creek

Shively Creek (Figure 6-41) is a tributary to East Pryor Creek that originates on the northeast face of the Pryor Mountains and flows easterly across tribal and private lands for 4.5 miles to its confluence with East Pryor Creek. A mixture of nonhybridized and introgressed Yellowstone cutthroat and rainbow trout inhabit most of this short stream, except for the uppermost mile.

The presence of rainbow trout and hybrids presents a substantial threat to the Yellowstone cutthroat trout in Shively Creek. Potential actions include reclaiming the stream for Yellowstone cutthroat trout, and installation of barrier to prevent reinvasion of nonnative species. Future conservation planning for Shively Creek should consider the potential to expand the extent of habitat occupied by Yellowstone cutthroat trout into East Pryor Creek.

6.8.5 Hay Creek

Hay Creek (Figure 6-41) originates on the northeast face of the Pryor Mountains and flows entirely within the Crow Reservation for nearly 20 miles before entering Pryor Creek. Much of Hay Creek has prairie stream affinities, and does not provide habitat suitable for Yellowstone cutthroat trout. The trout-bearing portion of Hay Creek is the seven miles upstream of the Pryor - St. Xavier BIA road. This reach supports nonhybridized Yellowstone cutthroat and brook trout.

Brook trout are a substantial threat to persistence of the Yellowstone cutthroat trout in Hay Creek. Options to protect this core population include removal of brook trout and installing a barrier. Brook trout suppression may be an appropriate interim tool in reducing interspecific competition, and would allow Yellowstone cutthroat trout to increase in abundance.

6.8.6 Lost Creek

Lost Creek (Figure 6-41) originates on the northern face of the Pryor Mountains and flows northerly through Lost Creek Canyon on tribal lands for approximately seven miles before flowing sub-surface into a large alluvial outwash at the mouth of the canyon. From this outwash, Lost Creek extends five more miles to Pryor Creek just upstream from the town of Pryor. An irrigation diversion captures the entire flow of Lost Creek at the mouth of the canyon and conveys it westerly approximately 3.5 miles to the Pryor Creek Ditch.

Historically, Lost Creek was barren of fish; however, the canal has provided a conduit for invading brook trout and consequently Lost Creek now supports a robust population of brook trout. A natural waterfall barrier (6 feet high) exists approximately 1.5 miles upstream from the diversion, which confines brook trout below the barrier and protects the upper fishless portion of the stream.

The Lost Creek ditch screening project began in 2010 as a conservation effort to eliminate brook trout and introduce Yellowstone cutthroat trout to this previously unoccupied habitat within the Pryor Creek watershed. This project will establish Yellowstone cutthroat trout throughout the Lost Creek drainage, while eliminating the threat of upstream reinvasion of brook trout.

6.9 Bighorn Lake Subbasin (HUC 10080010)

The Bighorn Lake hydrologic unit (Figure 6-42) straddles the Montana/Wyoming border, with about three quarters of the watershed being in Wyoming. The presumed historic distribution of Yellowstone cutthroat trout in this hydrologic unit encompassed 278 miles of stream, but Yellowstone cutthroat trout are now present in 64 miles stream habitat (May et al. 2007).