Yellowstone Preserve Yellowstone Cutthroat Trout Enhancement Project

Initial Project Assessment

Prepared by:
Carol Endicott
MFWP
Yellowstone Cutthroat Trout Restoration Biologist
Landowner Incentive Program
111 ½ North 3rd Street
Livingston, MT 59047

Montana Fish, Wildlife & Parks

1.0 Introduction

The Yellowstone Cutthroat Trout Project/Landowner Incentive Program assists private landowners seeking to improve habitat for Yellowstone cutthroat trout on their property. This report, or project assessment, documents preliminary evaluations for a potential project on the Yellowstone Preserve, a planned residential subdivision on the Yellowstone River, east of Livingston. The objectives of the project assessment are to describe relevant literature and data, describe existing conditions and potential, and provide recommendations to landowners. If landowners agree to proceed with conservation activities, Montana Fish, Wildlife & Parks' Yellowstone cutthroat trout restoration biologist will provide technical, financial, and planning assistance to implement restoration activities on these private lands.

2.0 Project Background

The Yellowstone Preserve is planned subdivision along the Yellowstone River, which has recently been annexed by the City of Livingston. The property lies on the right or south bank of the Yellowstone River, downstream of the city's current footprint (T2S, R10E, Section 5, Figure 2-1). The referral came through Ron LeCain of Confluence, Inc. who has been providing environmental planning, design, and permitting services to Yellowstone Partners, owners and developers of the property.

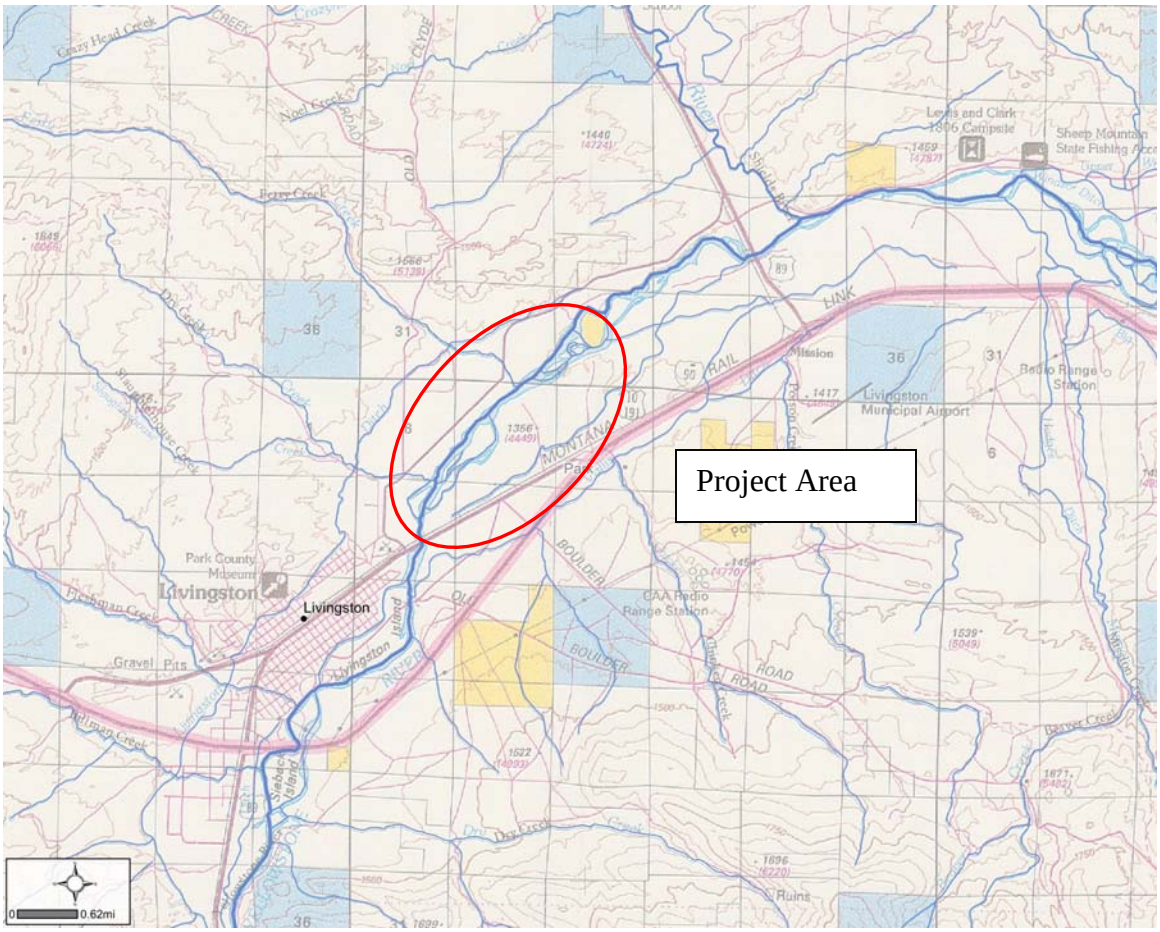

Figure 2-1: Overview map showing proximity to Livingston, Montana.

Plans for the property include construction of a mixture of high and low-density housing. In addition, the owners want to enhance and restore surface water features, including a high flow channel of the Yellowstone River and a series of former spring creeks (Figure 2-2). Interception of spring flows by a ditch and highway and railroad berms has eliminated these as surface water features for decades, although their channels remain mostly intact. A trail system will be among the amenities of this subdivision, facilitating recreational use of this planned open space.

Consistent with the emphasis on promoting the natural resource values of this property, Yellowstone Partners were also interested in conserving native species, such as Yellowstone cutthroat trout. Specifically, they were interested in the potential for establishing consistent stream flow and spawning habitat in the high water channel and dewatered tributaries on this property. MFWP could imprint Yellowstone cutthroat trout fry on these waters providing recruitment to the Yellowstone River.

Water rights associated with this property are significant and include about 40 cfs from the Yellowstone River and several high output agricultural wells. Currently, a consultant specializing in water rights is working to convert these rights from irrigation to fisheries uses. Planned activities will be contingent on this conversion.

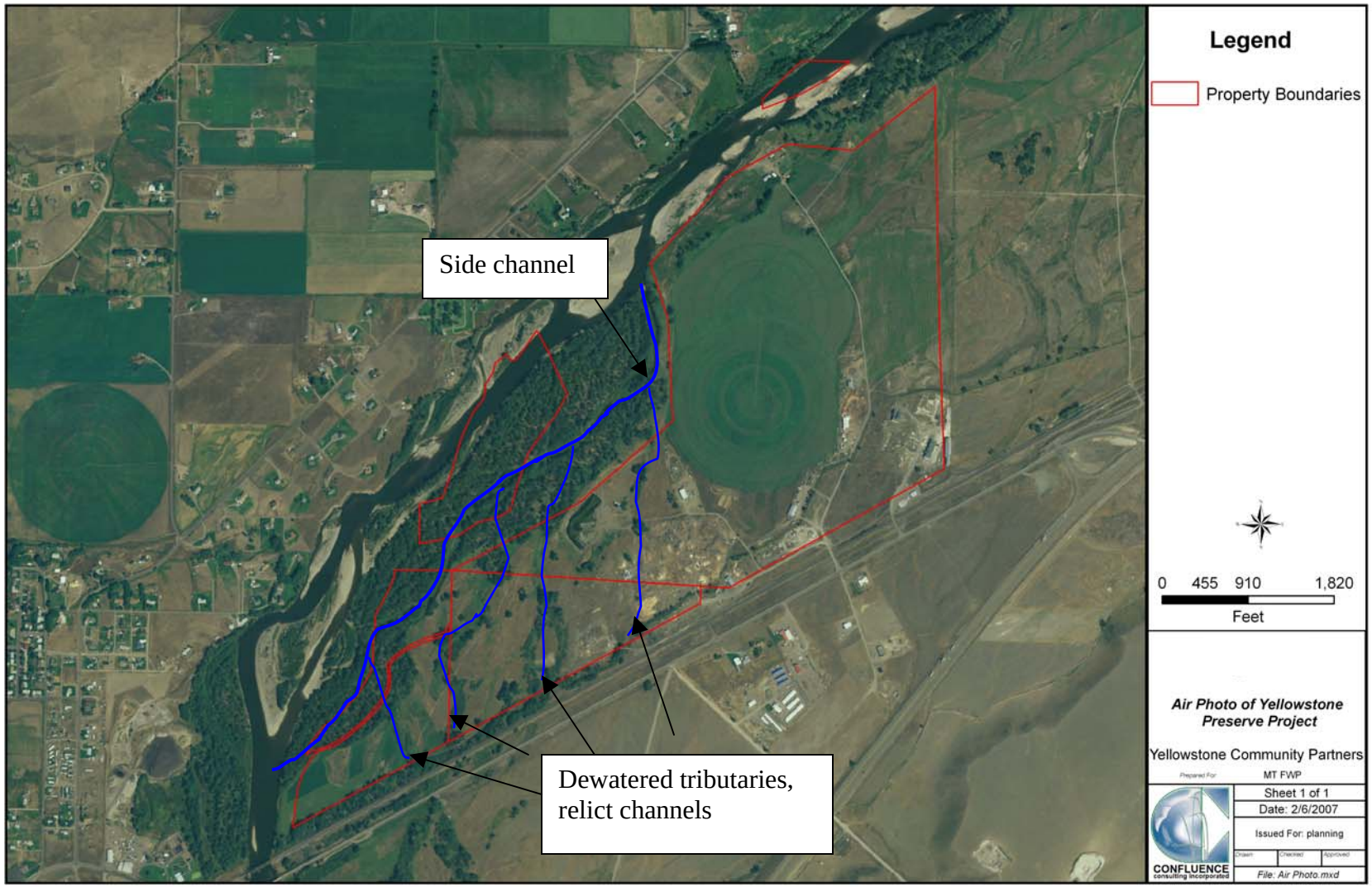

Figure 2-2: Project overview map

3.0 Fisheries Data Review

Review of available fisheries information is a key component of a project assessment that assists in evaluating the potential benefit to Yellowstone cutthroat trout from proposed restoration activities. Information allowing inference on the status of Yellowstone cutthroat trout in the project area includes regular monitoring conducted by MFWP, and an investigation of the timing and habitat use by spawning Yellowstone cutthroat trout, rainbow trout, and their hybrids in the Yellowstone River from Gardiner to Springdale (DeRito 2004).

MFWP monitors fish populations at several locations in the Yellowstone River. Established sampling stations closest to the project occur at 9th Street in Livingston and Springdale (Figure 4-3). The Ninth Street section lies less than three miles upstream of the Yellowstone Preserve. Differences in habitat limit generalization of fish populations between these reaches of river. The Ninth Street section is mostly high gradient riffle, a condition favoring rainbow trout (Scott Opitz, MFWP Fisheries Manager, personal communication). In contrast, the portion of river near the Yellowstone Preserve is a complex, braided channel, which is more suitable habitat for Yellowstone cutthroat trout.

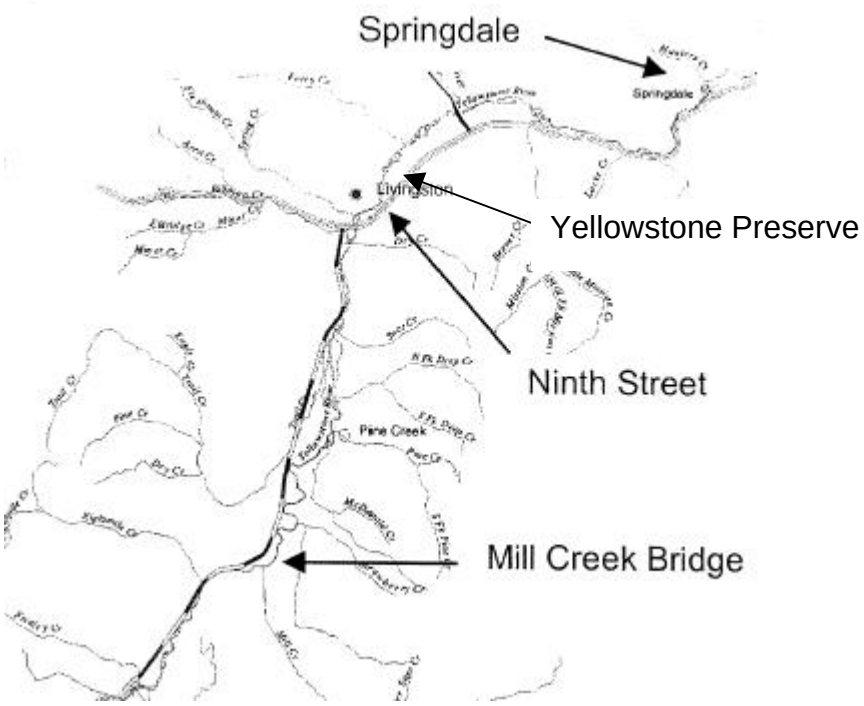

Figure 3-1: Long-term monitoring reaches on the Yellowstone River near the Yellowstone Preserve.

The Springdale section lies more than 30 river miles downstream from the Yellowstone Preserve. This reach also has limited use as a reference for Yellowstone cutthroat trout abundance near the Yellowstone Preserve. The distance between these reaches is one confounding factor. In addition, this reach has experienced substantial declines in

Yellowstone cutthroat trout populations in recent years (Opitz 2005). Generalizing this trend between these reaches is tenuous without additional data.

With caveats on applicability of available data to the portion of the Yellowstone River near the Yellowstone Preserve in mind, evaluations of the proportion of all trout comprised by Yellowstone cutthroat trout provides information on it status in the Yellowstone River. Sampling efforts in 2003 included all three sampling stations, allowing evaluation of longitudinal trends in Yellowstone cutthroat trout abundance for that year (Tohtz 2003, Figure 3-2). Yellowstone cutthroat trout were the least abundant among the three trout species captured at all three sampling stations. Proportion of the total catch comprised by Yellowstone cutthroat trout was highest at the Mill Creek section (15%) and decreased to 5 and 7% at the Ninth Street and Springdale sections respectively. Subsequent sampling in 2005 found too few Yellowstone cutthroat trout to allow calculation of a population estimate at the Springdale section (Opitz 2006). These data suggest a longitudinal decline in Yellowstone cutthroat trout abundance in the Yellowstone River, although habitat suitability may support pockets of higher concentrations of Yellowstone cutthroat trout locally.

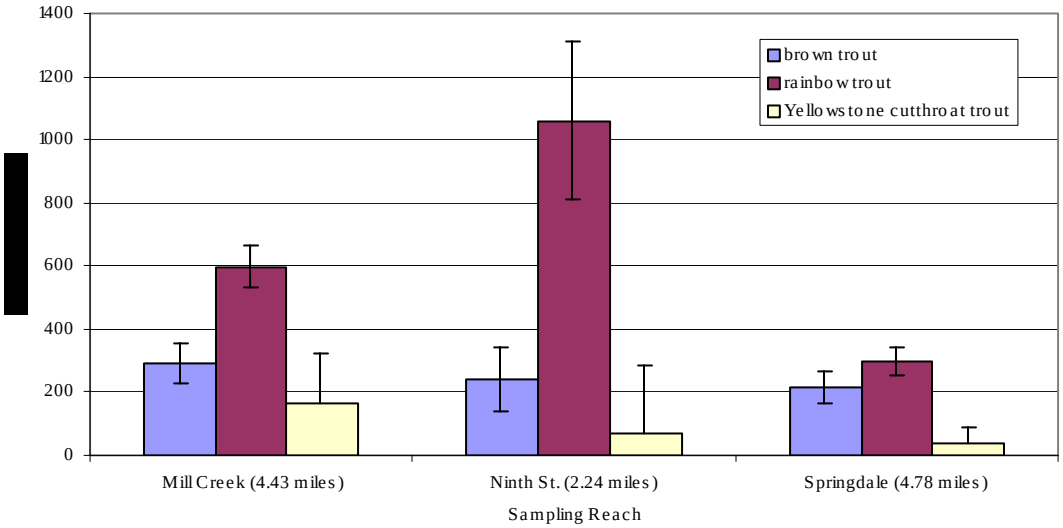

Figure 3-2: Population estimates for trout species captured in Yellowstone River sampling sections in 2003 (Tohtz 2003). Error bars denote 95% confidence intervals.

Investigations into habitat use and movements related to spawning of fluvial Yellowstone cutthroat trout in the Yellowstone River and its tributaries (DeRito 2004) provides additional insight into the potential benefits to providing spawning habitat on the Yellowstone Preserve. Radio-tagged Yellowstone cutthroat trout used a variety of habitat types for spawning including tributaries, side channels, and main stem sites, although most spawning occurred in tributaries. Moreover, the bulk of the spawning occurred in tributaries upstream of Livingston, in the Paradise Valley. The Yellowstone cutthroat trout spawning occurring near Livingston took place in side channels. The results of this study suggest a lack of suitable tributary habitat downstream of the Paradise Valley and

that Yellowstone cutthroat trout will use side channels in this portion of the river. Increasing the availability of both side channel and tributary spawning habitat may be beneficial to Yellowstone cutthroat trout in this portion of the Yellowstone River.

4.0 Site Visit

On January 30, 2007, Ron LeCain and I visited the site to evaluate potential for conserving and restoring Yellowstone cutthroat trout within the Yellowstone Preserve subdivision. We discussed a series of logistics associated with restoration potential such as water rights, condition of relict channels, and borrow sources for woody vegetation and gravel.

The high water channel is a prominent feature of this property (Figure 4-1). A cottonwood gallery with healthy willow understory occupies the riparian area. According to Ron LeCain, this channel had minimal flow during the summer months. On January 30, no surface flow was apparent, although ice occupied much of the streambed. Substrate composition is cobbles overlain by sand.

Figure 4-1: High flow braid of the Yellowstone River.

Four relict channels of former spring creeks are other features with potential to provide spawning habitat for Yellowstone cutthroat trout. Vegetation has encroached in some of these channels, although their morphology remains relatively intact (Figure 4-2). In other cases, substrate is still visible and consists of cobble-sized alluvium (Figure 4-3).

Figure 4-2: Vegetated old spring creek channel

Figure 4-3: Relict channel with cobble substrate still apparent.

Associated observations include availability of local sources of willows and gravel for restoration. Willows are common and will be available for transplanting along restored channel reaches. Likewise, a gravel quarry on the property could be a local source of gravel to provide suitable substrate for spawning.

5.0 Conclusions and Recommendations

This project has significant potential to benefit Yellowstone cutthroat trout restoration in the upper Yellowstone River. An apparent lack of suitable tributary spawning habitat may be a limiting factor related to relatively low abundance of Yellowstone cutthroat trout in the Yellowstone River downstream of Paradise Valley. Likewise, increasing side channel availability may be beneficial in terms of increasing Yellowstone cutthroat trout reproduction. The potential for this project to provide substantial spawning habitat to the Yellowstone River makes it an appropriate candidate for assistance through the Landowner Incentive Program.

Although this project has promise, several issues need consideration. Suitability of substrate for spawning is a major concern. Cobble-sized Yellowstone River alluvium apparently dominates both the Yellowstone River side channel and the relict spring creek channels. This substrate composition greatly reduces suitability for spawning, as trout would be unable to dig redds in a streambed armored with such large particles. Introduction of gravel from gravel pits on the property is a potential solution; however, hydraulic investigations into the sustainability of introducing gravel into the spring creeks and the side channel are essential before committing substantial public funds to the project.

Conversion of existing agricultural water rights to in stream flows is another contingency for this project. According the Ron LeCain of Confluence, a water rights specialist working on the issue is optimistic. Pending the outcome of these efforts, assistance through the Landowner Incentive Program, including facilitation with Trout Unlimited or Montana Water Trust, may also find an avenue to promote stream flow in both the side channel of the Yellowstone River and the abandoned tributaries.

Once feasibility of converting water rights and maintaining substrate composition is determined, the next step should be development of designs detailing channel reconstruction and revegetation approach. Presumably, the side channel will require little more than removing a sediment plug blocking connectivity with the main stem. More intensive channel work will likely be necessary on the relict tributaries to restore plan form and cross sectional morphology.

A final thought relates to public use of this area with construction of recreational trails. Educational signage would be an asset in informing the public on the Yellowstone cutthroat trout conservation efforts, river ecology, etc. Funding for this component is attainable through grants. Once again, assistance through the Landowner Incentives Program would apply in obtaining the necessary funds.

6.0 Literature Cited

DeRito, J.N. 2004. Assessment of reproductive isolation between Yellowstone cutthroat trout and rainbow trout in the Yellowstone River, Montana. Masters Thesis, Montana State University, Bozeman, Montana.

Opitz, S. 2006. Fisheries investigations in the Yellowstone and Shields River basins, Park County, Montana. Annual Report of 2005. Federal Aid Project F-113-R-5.

Tohtz, J. 2003. Fisheries investigations in the Yellowstone and Shields River basins, Park County, Montana. Annual Report for 2003. Federal Aid Project F-113-R-3, Montana Fish, Wildlife & Parks, Livingston, MT.