

# **Yellowstone Cutthroat Trout Management Program within the State of Montana**

**SEPTEMBER 2000**

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## **Introduction**

Cutthroat trout management has two very important but somewhat different components: a conservation component and a recreational fishery component. The conservation component deals with preservation of the subspecies and the unique adaptive life history characteristics. The recreational fishery component focuses on management for the direct benefit of the angling public. The information contained in this part of the management program for Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) details the conservation component of the program. This document is intended to build upon the conservation recommendations first identified in the status report completed in 1984 (Hadley 1984) and subsequently reaffirmed in the Yellowstone cutthroat management guide that was initially drafted in 1992 (Darling et al. 1992) and further edited and refined in 1994 (Shepard and Carty 1994). Even though the above-mentioned conservation documents were not officially adopted as firm direction, they have served to provide a solid foundation upon which a considerable amount of conservation action has been built. The primary purpose of this document is to formally present in a concise and centralized location the conservation direction for management of Yellowstone cutthroat trout within Montana. This program, when coupled with the companion Conservation Agreement, will serve to expedite implementation of conservation actions necessary to ensure the long-term well being of Yellowstone cutthroat trout within Montana. This conservation effort is a collaborative and coordinated effort between resource agencies that share responsibility for management of Yellowstone cutthroat trout and the habitat that supports these fish.

It is the intention of this conservation program and the cooperating agencies to preserve, enhance and restore populations of Yellowstone cutthroat trout within Montana. All special designations (e.g., species of special concern, sensitive species, species petitioned under ESA, etc.) assigned to this subspecies increase the management attention and emphasis directed toward protection, conservation and long term preservation. The conservation strategies and actions presently being employed will be enhanced by this renewed effort and collaborative focus. Implementation of this program should reduce most threats to long-term viability of this cutthroat trout subspecies and reduce the need for further designation of Yellowstone cutthroat trout as an imperiled fish within Montana. The initial term of this Conservation Program is a 10-year period. It is anticipated that this Program will be dynamic and flexible. It is also anticipated that revision and extension of the conservation program will take place at the end of the initial implementation period. As stated in the Conservation Agreement, the intent of this conservation program is not

total restoration of Yellowstone cutthroat into all waters that were historically occupied. Total restoration is neither feasible nor acceptable for a number of reasons. The Cooperators seek to improve efficiency by combining efforts, fostering efficient working relationships and by promoting conservation sufficient to ensure the long-term persistence of Yellowstone cutthroat trout.

## **Yellowstone Cutthroat Trout Conservation Goal and Objectives**

To be truly effective, conservation of Yellowstone cutthroat trout must be anchored to a clearly stated goal and well-defined objectives that provide needed specificity upon which to gauge success. Conservation of Yellowstone cutthroat trout will be founded on the preservation, enhancement and protection of existing populations within historic range in Montana. These populations currently serve as the foundation upon which future conservation efforts will be built, including those efforts to expand and restore core and conservation populations. By contrast, recreational fishery goal(s) focus on attributes necessary to maintain and in some instances maximize fishing opportunity.

**Yellowstone Cutthroat Trout Conservation Goal:** Ensure the long-term persistence of the Yellowstone cutthroat trout subspecies within the historic range in Montana at levels and under conditions that provide for protection and maintenance of both intrinsic and recreational values associated with this fish.

**Objective 1: Secure and Enhance.** As a priority action, efforts to secure and enhance all known core and conservation populations will be accomplished through development and implementation of population specific conservation plans.

A core population is defined as a discrete population of genetically pure Yellowstone cutthroat trout. Core populations provide the basis for protection and long-term maintenance of the Yellowstone cutthroat trout subspecies. Conservation populations include those populations that exist in a slightly introgressed or hybridized condition (i.e., greater than 90% Yellowstone cutthroat trout) and maintain unique life history or morphological characteristics. Each Population Conservation Plan will contain pertinent information and direction (e.g., current condition assessment, defined goals and objectives, identification of conservation actions, a time line for accomplishment, associated budgets, monitoring and evaluation needs, and roles and responsibilities) necessary for the protection, conservation and enhancement of the specific population. These plans are expected to change with time and updates and extensions will occur as the status of the population changes.

The priority for completion of the plans will rest first with the core populations and secondly with the conservation populations. The target date for completion of conservation plans for the known core populations is 2004. Plans for the conservation populations should be completed by 2006. Additional conservation plans will be completed and implemented as new populations are found and/or created.

Pending completion of population conservation plans, each conservation population's habitat, on federal lands, will be protected and maintained by implementation of a land use coordination strategy. Initial implementation of the land use strategy will be the same for both core and conservation populations. At present, 17 slightly introgressed conservation populations have been identified and many more are expected to occur.

The following matrix provides a suggested schedule of core population conservation plan completion, by Conservation Area (CA):

	<u>CA 1</u>	<u>CA 2</u>	<u>CA 3</u>	<u>CA 4</u>
	(15 Pop's)	(9 Pop's)	(8 Pop's)	(5 Pop's)
Per Year Effort	3 to 4	2 to 3	2 to 3	1 to 2

Notes:

1. A discussion of conservation areas will be presented later in the program.
2. Specific actions identified in the plans may include installation and/or enhancement of passage barriers, expansion of the population, improvement of habitat conditions, and other needed actions necessary for the protection and improvement of each population.
3. In certain situations it may be beneficial to preserve and protect specific hybridized populations that have special adaptive life strategies and/or population characteristics, which are viewed as significant. In these situations, these conservation populations will be maintained and managed under the same habitat and population requirements that are applied to core populations.

**Objective 2: Population Identification.** Complete the effort to identify all currently existing stream populations by 2004. Efforts to identify existing populations will be a component of the annual program of work for each Conservation Area.

**Objective 3: Population Restoration.** As a priority conservation action, efforts to substantially expand the distribution of core and conservation populations during the term of this conservation program will be implemented through restoration and establishment of new populations. Specific consideration will be given to establishment of larger interconnected populations. At this point, the specific level or schedule of expansion has not yet been determined. Population expansion will address both numbers and distribution. An analysis of introduction opportunities is being completed (expected completion spring 2001). This analysis will serve as a reference to assist in final quantification of this objective.

**Objective 4: Conservation of Lake Populations.** Include lake populations as a valued component of the conservation effort by development and implementation of a management protocol that protects genetic integrity and population health of lake populations. The date for completion of the management protocol is 2001.

**Objective 5: Public Outreach.** Increase efforts to inform and educate the public on the various aspects of native fish conservation, including an increased effort to provide technical assistance to private landowners, resource users and public land managers. These efforts will be ongoing, on an annual basis, throughout the term of this program.

**Objective 6: Improved Coordination of Effort.** Increase communication and coordination with the other States, Federal agencies, Tribal governments and others involved in Yellowstone cutthroat conservation. Support and participate in annual meetings of the Yellowstone Cutthroat Trout Interstate Coordination Committee.

## Origins and Taxonomic Theory

While it is not the intent of this conservation program to provide a detailed documentation and discussion of the phylogeny and prehistoric zoogeography of Yellowstone cutthroat trout, it is important to review theory presented in a recent work on native western trout (Behnke 1992). Phylogenetic and zoogeographical theory supports the concept that evolutionary sequences leading to the present cutthroat trout species and associated subspecies originated in the mid-Pleistocene era (more than a million years ago). Most distributions were determined by events occurring in the last glacial and post-glacial periods (about 70,000 years ago to the present) (Behnke 1992). Yellowstone cutthroat trout are one of ten taxonomically acknowledged subspecies of cutthroat trout. In addition, there are four other cutthroat forms (i.e., finespotted Snake River cutthroat, Humboldt cutthroat, Alvord cutthroat and Whitehorse cutthroat) that have not been officially named which inhabit specific locations and exhibit unique phenotypic characteristics (Behnke 1979; 1992). One cutthroat subspecies (yellowfin cutthroat trout) is presumed to be extinct.

Yellowstone cutthroat trout became isolated in the headwaters of the Snake River following creation of Shoshone Falls (between 30,000 and 60,000 years ago) and in two distinct areas of the lower Columbia River Basin (Waha Lake, Idaho and Crab Creek, Washington)(Behnke 1979; 1992). Behnke (1992) also presents the most logical method of movement between the Snake River and Yellowstone River drainages following the last glacial period (about 8,000 years ago). It is believed that cutthroat entered the Yellowstone River drainage via passage from the Snake River (Columbia River drainage) to the Yellowstone River (Missouri River drainage) at Two Ocean Pass in Wyoming (Behnke 1992). This access point still exists today. This headwater transfer allowed for movement and expansion of Yellowstone cutthroat trout into suitable habitats east of the Continental Divide within the Yellowstone River drainage (Behnke 1979; 1992). Genetic analysis, using electrophoretic and other techniques, has indicated that minimal genetic divergence has taken place within Yellowstone populations. It is likely that all currently existing populations of Yellowstone cutthroat within Montana represent a single evolutionary significant unit (ESU) given the probability that a considerable amount of gene flow occurred between a substantially large number of populations (Dr. Robb Leary, Univ. of Montana Wild

Trout Genetics Lab, pers. comm.), or that insufficient time has elapsed since movement into the Yellowstone River drainage for substantial genetic differences to be manifest.

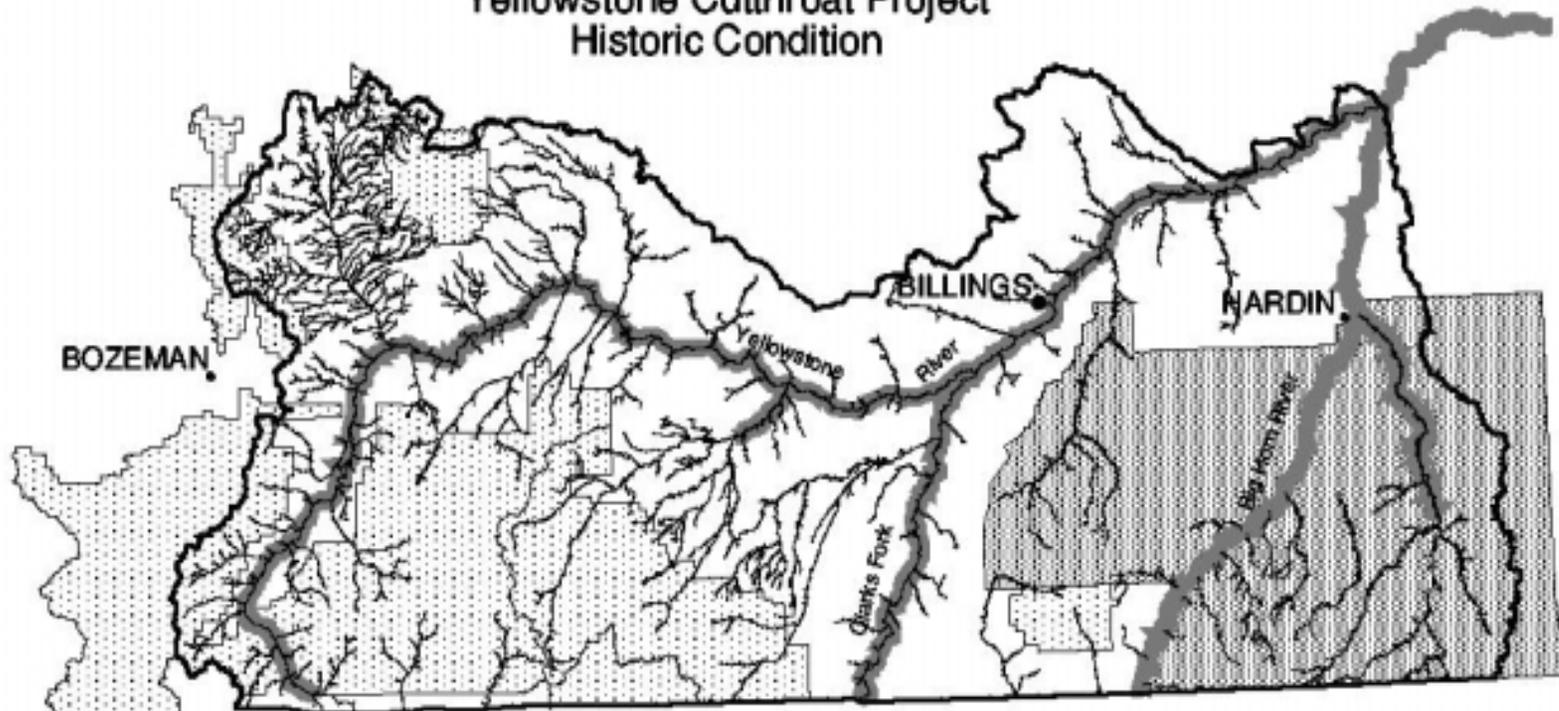
## **Historic Distribution within Montana**

For the purpose of Yellowstone cutthroat trout, reference to prehistoric distributional status addresses conditions existing before the presence of Euro-American explorers (approximately 1800 AD) within the Yellowstone cutthroat trout distributional area (Figure 1). Reference to historic status addresses conditions occurring during and subsequent to the exploration and settlement of the western Rocky Mountains by early explorers and settlers (after 1800 AD). Within the Yellowstone River drainage, cutthroat trout occupied a substantial number of headwater streams as indicated in both Jordan's (1891) and Evermann's (1891) reports which provide information from areas in and adjacent to Yellowstone National Park.

The actual extent of cutthroat distribution within the lower portions of the Yellowstone River drainage was not well documented. The fact that cutthroat trout were documented in the upper reaches of the Tongue River drainage (Evermann and Cox 1894; Willert 1986) and not in the lower portions of the Tongue and other tributaries, or even the lower main stem Yellowstone River (Coues 1893 as noted in Evermann and Cox 1894), leads one to ponder on just how much of the lower Yellowstone River Drainage was actually occupied at the time of early exploration and settlement. From a prehistoric perspective, it is very possible that there were periods of time when climatic conditions (i.e., cooler and wetter periods) would have allowed for population expansion down to and including the Tongue River drainage (Behnke 1992). During such conditions it could be conceivable that the entire Bighorn River drainage would have been suitable for cutthroat trout. It is also possible that cutthroat located in the upper Tongue River were a result of a basin transfer from the Little Bighorn River basin and that cutthroat never did occupy the lower portions of the Yellowstone River or the Tongue River (May 1996). Both options are feasible given climatic variability and topographic characteristics.

From a historical perspective and for the purposes of this conservation effort, the Yellowstone cutthroat trout distributional range within Montana includes that portion of the Yellowstone River above the confluence of the Bighorn River. This would include all tributary streams above that point. In addition, the historical range includes a number of tributaries to the Bighorn River from the Little Bighorn River upstream. It has been estimated that approximately 4,300 miles of stream habitat would have been historically occupied. Only a few lakes are believed to have been historically occupied (i.e., possibly as few as two lakes or as many as six).

Figure 1:  
Yellowstone Cutthroat Project  
Historic Condition



## Current Distribution and Population Health

The current status of Yellowstone cutthroat trout within Montana reflects the influence of altered habitat, presence of non-native trout, disease, and over-exploitation. It is important to understand that while most of these influences accompanied early settlement of Montana in the late 1800s, many instances of habitat alteration, continued impacts from non-native fish and, to a lesser degree, over-harvest continue at the present time. The natural resources and agricultural products needed to sustain human population growth have exerted negative influences on many Montana streams and reduced their ability to support cutthroat trout. In addition, non-native rainbow, brown and brook trout, first introduced into Montana in the late 1800s, have replaced native cutthroat trout in most streams and rivers. A recently completed status assessment (May 1998) indicates that genetically pure Yellowstone cutthroat trout occupy only about 428 miles (10%) of occupied historical stream and river miles. This most recent assessment supplemented information provided in the status assessment completed in 1996 for Yellowstone cutthroat trout (May 1996).

These recent assessments of Yellowstone cutthroat within Montana have been based on findings associated with 15 years of genetic validation and the professional views of numerous biologists familiar with the assessment area. The most recent assessment (May 1998) and additional information (Joel Tohtz, Montana FWP Fisheries Biologist, pers. comm.) identifies a total of 40 distinct, genetically pure, core populations of Yellowstone cutthroat trout (Appendix A). The majority of these populations occupy streams or stream reaches located primarily in headwater reaches, which are mostly less than ten miles in length. Only four populations occur in situations where occupied habitat exceeded 30 miles. Most populations are isolated from each other (Figure 2). A few populations have interconnections (metapopulation) between tributaries within the boundaries of a larger watershed. According to Montana fish stocking records, 32 of the 40 streams and/or watersheds that support pure populations have been stocked with at least one of the following fish species: rainbow trout, brook trout, brown trout, Yellowstone cutthroat trout, westslope cutthroat trout, or other trout of unidentified speciation. Currently, 24 streams that support existing populations also support other non-native fish species either sympatrically or directly downstream of an isolating barrier. There are only two instances where rainbow trout and Yellowstone cutthroat may be coexisting without significant hybridization: the main Yellowstone River and the lower mainstem Shields River. More investigation will be required to fully understand the isolation mechanism that is in operation.

Information collected to date on hybridized populations indicates that 17 conservation populations (90% to 99.9% genetically pure) currently occupy about 70 stream miles. Hybridized populations of less than 90 percent genetic purity currently occupy approximately 56 stream miles. This information is very limited and it is anticipated that the amount of stream habitat occupied by hybridized Yellowstone cutthroat populations will be proven to be substantially greater.

Current status of lake populations of Yellowstone cutthroat is more positive. Through an extensive historical stocking program, 46 lakes (942 surface acres) within the Absaroka and Beartooth mountain ranges currently support self-sustaining Yellowstone cutthroat populations. An additional 72 lakes (1,541 surface acres) within that same area support Yellowstone cutthroat trout populations that are maintained through stocking of genetically pure fish. Additionally, another 61 lakes that are within the Yellowstone River Drainage in Park and Gallatin counties likely support either self-sustaining or hatchery maintained Yellowstone cutthroat populations.

Hatchery plants are derived from McBride Lake stock that have been continually infused with wild genetics to maintain genetic variation.

A major focus of the recent assessment was associated with addressing the relative health of each stream population as influenced by: (1) The potential of hybridization; and (2) a combination of stochastic and deterministic influences on population well-being (Table 1). Initially the assessment focused on core populations with the intent that assessment of the conservation populations would follow.

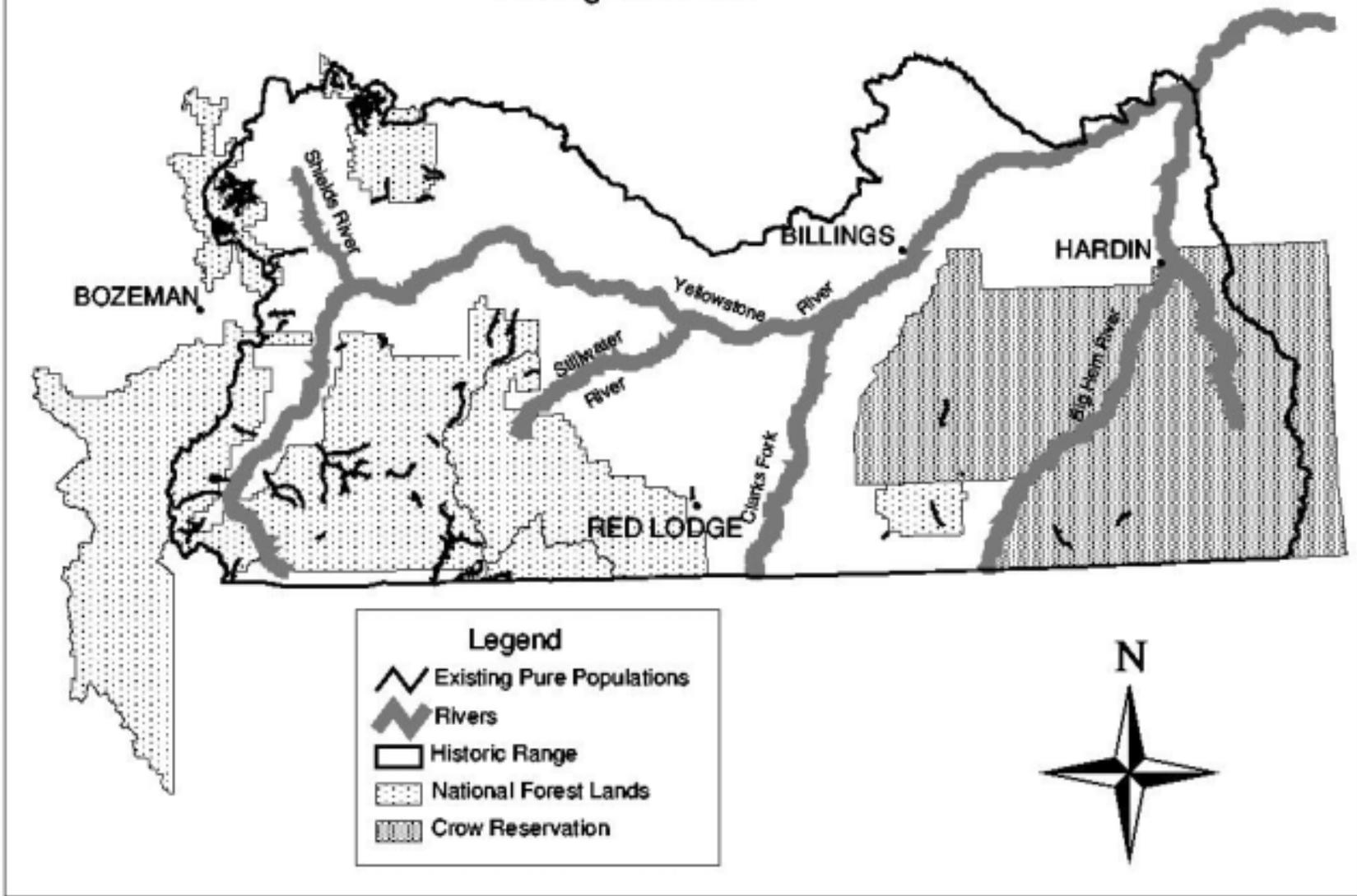
Hybridization of Yellowstone cutthroat with rainbow trout and other subspecies of cutthroat continues to be a significant concern and problem. To assess the relative risk of localized extinctions due to hybridizations, each core population was placed into one of four categories (low risk, moderate risk, high risk and extreme risk) based on considerations that included isolation from hybridizing species, barriers, access, and stocking. Eighteen (18) populations were viewed as being at high (e.g., Flathead Creek, Sixmile Creek, and Shields River) to extreme risk of hybridization (i.e., Tom Miner Creek, Mulherin Creek, and Mill Fork Mission Creek). Ten populations (e.g., upper Boulder River, Mill Creek and Soda Butte Creek) were viewed as having a moderate risk, and ten (e.g., Slough Creek, Fridley Creek and Bad Canyon Creek) had a low risk associated with hybridization. The two most recently identified populations (West Pine Creek and the mainstem Yellowstone River) as well as the Shields River populations, are yet to be assessed.

For factors associated with detrimental deterministic and stochastic influences, 11 core populations were viewed as being at high risk (e.g., Bangtail Creek, Shields River and Soda Butte Creek). Seven populations were viewed as being at extreme risk (e.g., Mill Fork Mission, Donahue Creek and North Fork Willow Creek) due to negative influences. Seventeen were viewed as having a moderate risk, and only three populations were viewed as having a low risk of extinction due to the combined factors. The mainstem Yellowstone and Shields Rivers and West Pine Creek have not been formally assessed.

Past and present land uses that are currently affecting Yellowstone cutthroat habitat were identified by using an assessment approach similar to that applied to westslope cutthroat within the upper Missouri River Basin. Land uses evaluated included timber, range, mining, recreation, roads, irrigation diversions, and other uses.

Affected fish habitat components include: water quality, water quantity, fish migration and passage, quality and quantity of spawning and/or rearing habitat, riparian zone condition, redd disturbance, and harassment of fish. Risks to the viability of a population and magnitude of those risks were determined. For most populations, certain land use influences were identified as having a negative influence on individual fish and, for a relatively high percentage of populations, impacts to population viability were of concern. It was estimated that population viability of 22 of the 38 populations was at risk due to past and present land management activities. The relative ranking of the viability risk for these 22 populations was as follows: High 13 populations, Moderate 7 populations, and Low 2 populations.

Figure 2:  
Yellowstone Cutthroat Project  
Existing Condition



**Table 1. Summary Information Associated with Currently Existing Stream Populations of Yellowstone Cutthroat Trout in Montana.**

<u>Name</u>	<u>Legal</u>	<u>Forest/ Other</u>	<u>Miles</u>	<u>Hybridiz. Risk</u>	<u>Other Risk</u>	<u>Land Use Influence</u>	<u>Conserv. Actions</u>
Yellowstone and Shields Rivers							
Bad Canyon Cr.	T4S,R15E,Sec 1	Custer	3.5	Low	Extreme	Moderate	Major
Big Bull Elk Cr.	T8S,R30E, Sec 35	Crow Res	5.9	High	Moderate	None	Minor
Brackett Cr.	T1N,R7E,Sec 5	Gallatin	15.0	High	Moderate	Moderate	Minor
Crooked Cr.	T8S,R25E, Sec 35	Custer	5.2	High	Moderate	Low	Minor
Darrock Cr.	T8S,R9E,Sec 27	Gallatin	1.9	High	Moderate	None	Minor
Dryhead Cr.	T7S,R28E, Sec 7	Custer/Crow Res	0.3	Moderate	Extreme	High	Minor
East Boulder R.	T4S,R13E, Sec 23	Gallatin	10.7	Low	Moderate	None	Minor
Boulder R.	T6S,R12E,Sec 28	Gallatin	4.7	Moderate	High	None	Minor
Bridge Cr.	T6S,R12E,Sec 21	Gallatin	6.7	Low	Moderate	None	Minor
Hawley Cr.	T6S,R12E,Sec 1	Gallatin	3.0	Low	High	None	Minor
Hay Cr.	T5S,R27E,Sec 33	Crow Res	6.0	High	High	None	Minor
Flathead Cr.	T3N,R7E, Sec 26	Gallatin/Pvt	84.4	High	Moderate	Moderate	Minor
SF Big Timber Cr.	T3N,R6E, Sec 20	Gallatin/Pvt	8.5	High	Low	None	Minor
SF Little Timber Cr.	T2N,R12E, Sec 11	Gallatin/Pvt	4.6	Moderate	Moderate	None	Minor
Piney Cr.	T8S,R25E, Sec 35	Custer/State/Pvt	1.5	Low	Extreme	High	Minor
Mill Cr.	T6S,R10E, Sec 32	Gallatin	43.4	Moderate	Moderate	Moderate	Major
Brushy Fork	T7S,R20E, Sec 17	Pvt.	2.4	Moderate	Extreme	High	Minor
Donahue Cr.	T7S,R7E, Sec 6	Gallatin	7.3	Low	Extreme	High	Minor
Fridley Cr.	T5S,R7E, Sec 26	Gallatin	4.8	Low	Moderate	None	Minor
Rock Cr.	T7S,R7E, Sec 19	Gallatin	9.6	Low	Moderate	Moderate	Minor
Sixmile Cr.	T7S,R8E, Sec 9	Gallatin	17.7	High	High	Moderate	Major
Rotten Grass Cr.	T7S,R32E, Sec 23	Crow Res	3.8	Low	Moderate	None	Minor
Pebble Cr.	T9S,R13E, Sec 25	Gallatin/YNP	8.0	Moderate	Low	None	Minor
Slough Cr.	T9S,R12E, Sec 24	Gallatin/YNP	35.3	Low	Moderate	Moderate	Minor
Soda Butte Cr.	T9S,R14E, Sec 33	Gallatin/YNP	7.9	Moderate	High	High	Major
Mulherin Cr.	T9S,R7E,Sec 9	Gallatin	13.2	Extreme	Low	None	Minor
Tom Miner Cr.	T8S,R6E, Sec 9	Gallatin/Pvt	5.0	Extreme	Moderate	High	Minor
West Pine Cr.							
Suce Cr.	T3S,R10E,Sec 16	Gallatin	2.2	High	Moderate	None	Minor
Lower Deer Cr.	T2S,R15E,Sec 29	Gallatin	14.2	Moderate	High	High	Major
Upper Deer Cr.	T3S,R14E,Sec 15	Gallatin	6.8	High	High	None	Minor
Smith Cr.	T6N,R10E,Sec 6	Gallatin	9.7	High	High	High	Minor
Shields R.	T5N,R11E, Sec 18	Gallatin	52.1	High	High	High	Minor
Bangtail Cr.	T1N,R9E, Sec 29	Gallatin/Pvt	8.3	High	High	High	Minor
Rock Cr.	T2N,R11E, Sec 8	Gallatin	6.3	Moderate	Moderate	None	Minor
NF Willow Cr.	T1S,R8E, Sec 4	Gallatin/Pvt	2.4	High	Extreme	High	Major
Miner Cr.	T2S,R8E, Sec 27	Pvt	2.6	Moderate	Moderate	Low	Minor
Billman Cr.	T2S,R8E, Sec 13	Pvt	5.2	High	High	High	Minor
Mill Fork Mission Cr.	T3S,R11E, Sec 4	Gallatin	2.9	Extreme	Extreme	High	Minor

Conservation actions implemented to date were also identified for each population. The actions identified include formulation of generic and population-specific goals and objectives, removal of hybridizing and competing species, stocking adjustments, genetic testing, private pond permit regulation, population density estimates, special fishing regulation, special studies, barrier placement, and barrier enhancement. Habitat oriented actions have included development of habitat management plans, identification of land use coordination requirements, habitat surveys, habitat restoration and/or enhancement, watershed restoration, water leasing, and monitoring. All populations have benefited to some extent from the conservation actions taken to date. A few populations (e.g., Bad Canyon Creek, Sixmile Creek, Mill Creek, Soda Butte Creek, and Lower Deer Creek) have had major conservation actions, including removal of hybridizing and/or competitive species, barrier placement and/or enhancement, direct habitat enhancement and/or restoration, and watershed restoration.

## Yellowstone Cutthroat Conservation

This section contains conservation commitments and associated program elements that have been identified in the Conservation Agreement and are considered essential to long-term preservation of Yellowstone cutthroat trout in Montana. It is important to understand that many of the conservation actions discussed are extensions of efforts that have been ongoing for the past several years. The philosophy associated with this program recognizes that conservation and restoration of Yellowstone cutthroat trout depends upon protection, restoration and enhancement of both core and conservation populations and their respective habitats. The program also recognizes that conservation of genetic purity is the desired foundation upon which these conservation efforts are anchored.

The Program is linked to the reality that healthy populations require healthy habitats, which in turn are dependent upon healthy, functioning watersheds.

We appreciate that true conservation builds upon ecological considerations at broader scales (e.g., aquatic communities, aquatic ecosystems, watersheds, landscapes, etc.), but we also see value in using specific indicators, such as Yellowstone cutthroat trout, as "keystone or focal species" that represent conditions in general and provide a reasonable indication that conditions, in the broader context, are favorable to healthy aquatic ecosystems. We fully anticipate that Yellowstone cutthroat conservation actions will also address the needs of other native aquatic organisms and assemblages.

This conservation program takes into consideration the five (5) criteria considered in Section 4(a)(1) of the Endangered Species Act of 1973, as amended, which include:

- \*\* Present or threatened destruction, modification or curtailment of habitat or range.
- \*\* Over-utilization for commercial, recreational, scientific, or educational purposes.
- \*\* Disease, predation, competition and hybridization.
- \*\* Inadequacy of existing regulatory mechanisms.
- \*\* Other natural (e.g., drought, fire, wind, precipitation, etc.) or human induced (e.g., socio-political) factors affecting continued existence.

It is also vitally important that the conservation effort include an active program of public outreach. Future conservation will depend upon increasing the awareness and understanding of current conditions under which Yellowstone cutthroat exist, and exposure to the actions needed to provide for long-term conservation. It is equally important to develop and maintain a research effort that will provide needed information to support and enhance conservation efforts.

The following program components outline the Yellowstone Cutthroat Conservation Program for Montana.

### **Administrative Elements**

The historic and current distribution of Yellowstone cutthroat trout in Montana occupies a wide range of ownerships and jurisdictions, each of which operate under different laws, regulations, policies and mandates. Species and population management authority generally resides with the State and falls within the jurisdiction of Montana Department of Fish, Wildlife and Parks (FWP). An exception to this is associated with cutthroat populations that occur on Indian tribal lands. A significant number of existing populations reside on National Forests. The program is structured to deal with the conservation needs of Yellowstone cutthroat trout and with the political and/or social implications of an imperiled species. Through a collaborative and cooperative process, FWP will serve as lead in the conservation effort and will coordinate actions among the other interested parties. Likewise, FWP will have the lead in Yellowstone cutthroat recreational fishery management. The following administrative actions will be part of the conservation component of cutthroat management.

**1. Development of a Conservation Agreement.** This agreement will provide the contractual foundation for actions and efforts associated with Yellowstone cutthroat conservation. The agreement affirms conservation goal/objectives, identifies roles and responsibilities, and defines conservation action. The Conservation Agreement, to be effective, should be signed by agency leadership at various levels of responsibility. Other project-level agreements will be developed as needed to assist in implementation of specific conservation actions.

**2. Development of a Conservation Program Document (this document).** The program document will provide a generalized discussion of essential actions that in combination will serve to conserve and protect Yellowstone cutthroat trout in Montana. The document will reaffirm conservation goal/objectives, discuss current status, provide identification of generalized conservation actions, define roles and responsibilities, set time frames for accomplishment, and identify budgetary needs.

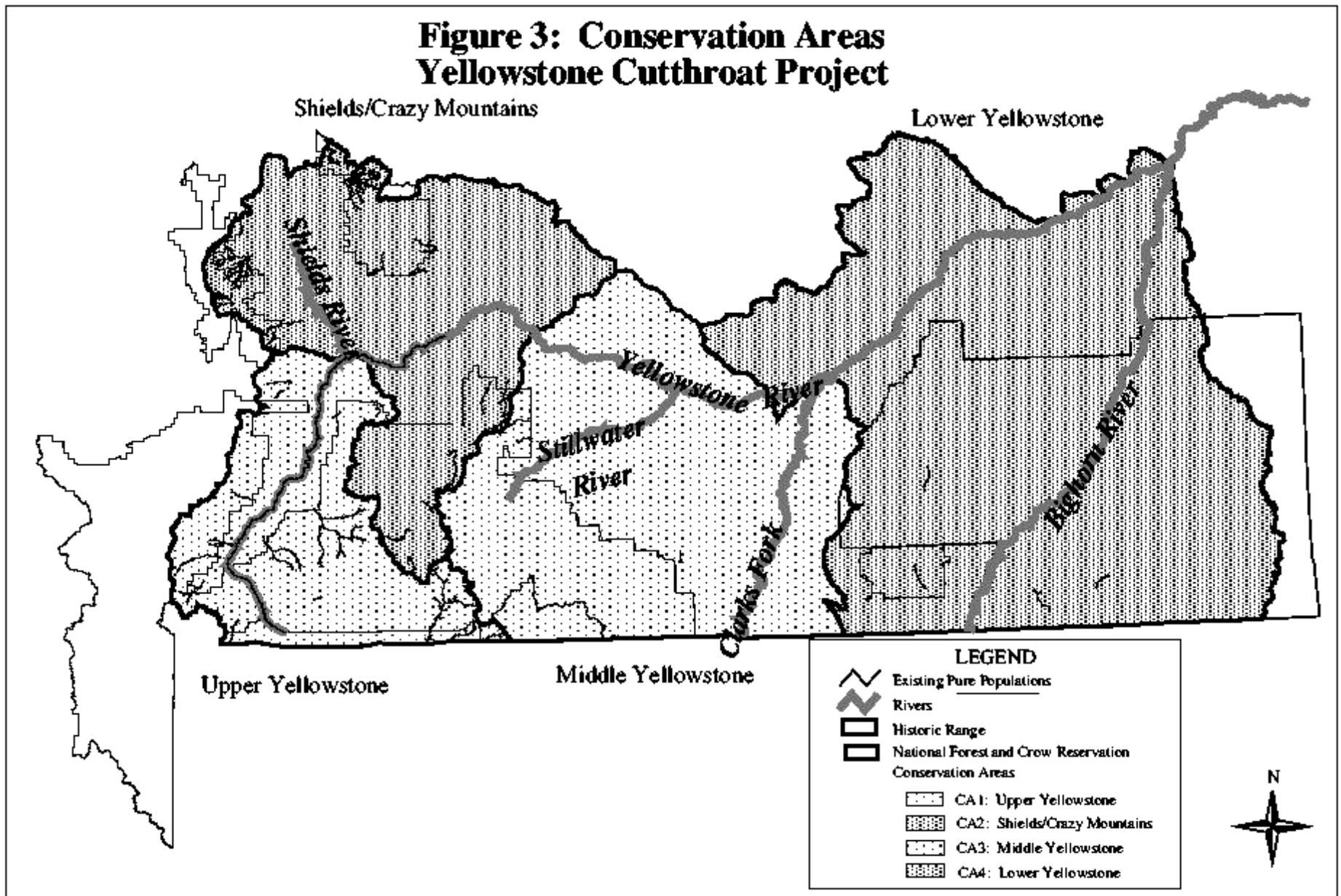
**3. Development of Population Conservation Plans (Appendix B).** The program will promote development of Conservation Plans, which address the specific conservation needs of each population. These Population Conservation Plans will serve as a ready reference of pertinent information on current and desired conditions, actions needed to protect, conserve and enhance the population, timelines for completion, identification of roles and responsibilities, and specific financial requirements.

## **Organizational Components**

Conservation efforts for other trout have included a number of different organizational formats and levels. Organizational considerations for this conservation program will be met at the lowest administrative level possible. The following organizational actions are part of the conservation program:

- 1. Creation of a Yellowstone Cutthroat Conservation Council.** FWP will oversee establishment of a Montana Yellowstone Cutthroat Conservation Council (Council) to oversee development and implementation of the conservation effort. The various agencies having legal responsibility for Yellowstone cutthroat conservation have expressed a willingness to participate in and support the conservation effort. The Council will be composed of agency administrators and technical staff, and the primary responsibilities will be associated with screening of conservation action, tracking of conservation effort, and facilitation through agency support. FWP will serve as the Council chair and at times may choose to delegate that responsibility to other Council members. The Council will meet at least once annually (late January to late February) and at other times necessary to provide oversight to the conservation effort.
- 2. Assignment of a Yellowstone Cutthroat Conservation Coordinator(s).** FWP will coordinate appointment of a Conservation Coordinator(s). These duties will be handled by an individual(s) occupying an existing agency position. The Coordinator(s) will serve under the direction of FWP as liaison between the Council, the Implementation Teams, Cooperators and interested parties. The Coordinator(s) will assist the Council in setting meetings, keeping minutes, and developing reports. The Coordinator(s) will serve as a catalyst for action, a mediator and negotiator in dispute resolution, and as a facilitator.
- 3. Creation of Conservation Areas.** The historic range within Montana will be partitioned into four Conservation Areas ( CA 1 -- upper Yellowstone River above Livingston, CA 2 -- the Shields River and Yellowstone River and tributaries to below Big Timber (Sweetgrass Creek), CA 3 -- the Yellowstone River between Sweetgrass Creek and the confluence of the Clarks Fork and tributaries (e.g., Stillwater and Clarks Fork Rivers), and CA 4 -- the lower Yellowstone River and tributaries including tributaries within the Bighorn River drainage) (Figure 3). This subdivision of effort will allow for focused attention to discrete areas within the historic range. Subdivision of effort will allow for the greatest degree of flexibility, will generate focused attention, will encourage healthy competition associated with the conservation effort, and will provide for focused public review and involvement (Figure 3).
- 4. Creation of Implementation Teams.** The program will include the creation of Implementation Teams (each composed of 2-5 persons) assigned to develop and implement actions at the Conservation Area level. These teams will be composed of field biologists having management authority, and others deemed appropriate. The Implementation Teams will provide recommendations to the Council and will be responsible for implementation of actions within the Conservation Area. The Implementation Teams will report to the Council. Other sub-teams could be created to address specific situations and conditions and these sub-teams will be under the direction of the Council or specific Implementation Teams, as appropriate.

**Figure 3: Conservation Areas  
Yellowstone Cutthroat Project**



**Return and Report (Program Monitoring).** The Council with representation from the Implementation Teams will meet annually to discuss accomplishments and to set future effort. An annual implementation report will be completed and made available to those interested in Yellowstone cutthroat trout conservation. This annual report will provide basis for determining the progress and relative success of the program in accomplishing the conservation goal. Each of the six program objectives will be addressed in the annual report. The Council will hold the annual meeting during a time period between late January to late February.

## **Conservation and Restoration Commitments**

The foundation of the conservation effort will be based on protecting and conserving all existing core populations of Yellowstone cutthroat trout to maintain as much genetic diversity as possible and to provide for a reasonable starting point for long-term preservation. All core populations, regardless of size and/or circumstance, will serve as the nucleus upon which future conservation action will be built. For the purposes of this program, each population that is genetically pure will be considered a core population. Conservation populations will include those populations that exist with a slight amount of hybridization and/or those populations that have unique life history or population characteristics felt to be of significance. Protection, restoration and recovery of Yellowstone cutthroat can be grouped into several general categories that include protection of the core and conservation populations, restoration of core populations, genetic management and general (recreational) fisheries management.

### **Conservation and Protection of Core and Conservation Populations**

As a priority action, all core and conservation populations will be secured and protected through development and implementation of population-specific Conservation Plans which address habitat conditions, population health, land use coordination and recreational use. These plans will describe conservation actions and time frames necessary to move from the current situation to a desired, long-term conservation condition. Many of the conservation actions identified in these conservation plans will require some form of NEPA or MEPA analysis, including public review, prior to implementation. Monitoring and evaluation will be significant components of each conservation plan. The following actions will be considered and specifically addressed in the population conservation plans, as appropriate:

**1. Isolation of Populations.** Each population will be assessed regarding the threat of invasion by hybridizing and/or competing nonnative fish species. Installation of passage barriers may be needed and will be preceded by an analysis that provides information on location, proper design, and effects on seasonal movements of fish and other components of the aquatic ecosystem. Temporary barriers may be installed until questions associated with installation of permanent barriers are answered.

**2. Removal of Non-Native Fish.** As a protective action, removal or suppression of non-native fish that are likely to hybridize or compete with core and conservation populations will be considered. These actions will be under the direction of the State and will be based on site-specific investigation and analysis and recommendation from an Implementation Team.

**3. Restoration and/or Enhancement of Habitat.** Long-term conservation and maintenance of Yellowstone cutthroat requires high quality habitat. The intent of this program component is to manage habitat at the highest potential quality based on inventory and analysis of channel and watershed attributes. Many habitats currently supporting Yellowstone cutthroat core and conservation populations are in sub-optimal condition due to habitat alteration and/or natural influences. Actions to restore habitat condition will be identified and implemented, including actions to improve conditions of water quality impaired streams (WQLS) that support Yellowstone cutthroat. In certain situations, enhancement options (e.g., passage barriers, spawning and rearing habitat) that create habitat conditions beyond those considered natural will be implemented to maximize benefits to a population. Habitat restoration and/or enhancement may be necessary on streams identified for population restoration or introduction.

**4. Reducing the Negative Influences of Land Uses.** Long-term conservation will require a lessening of detrimental influences of land use (public and private lands) on aquatic environments. This conservation program encourages improved relations with all landowners within watersheds containing core and conservation populations. Technical assistance will be made available to assist landowners in resolving impacts to Yellowstone cutthroat trout. For federal land management agencies, implementation of a coordinated land-use strategy, comparable to that developed for westslope cutthroat trout (Appendix C) will be adopted and implemented to protect each population until specific population conservation plans are finalized. There will be instances where interim conservation plans will be developed which do not specifically address land use in sufficient detail to provide adequate protection. In these cases, the coordinated land-use strategy will be applied until detailed analyses and plans are finalized. Efforts will be undertaken to reduce point and non-point pollution to cutthroat waters and to restore and maintain essential hydrologic conditions of the watersheds that influence cutthroat trout habitat.

**5. Expansion of Current Core and Conservation Populations.** For many populations, long-term conservation will require expansion of the amount of occupied habitat and an increase in the density and diversity of life forms. In certain instances, this expansion will allow for creation of interconnections between tributaries within a watershed and possibly interconnections between watersheds (metapopulations). These considerations will be made during development of population conservation plans and through larger sub-basin assessments as determined necessary.

**6. Identification of Core and Conservation Populations.** It will be necessary to continue the effort to locate all currently existing populations. Much has been done over the past 15 years to identify existing populations but more work is needed. It is particularly important that Yellowstone cutthroat status within the main stem Yellowstone River and other major tributaries (e.g., Clarks Fork, Stillwater and Shields Rivers) be assessed.

**7. Protection and Maintenance of Lake Populations.** As a result of ongoing fishery management, a substantial number of lake populations of potentially pure Yellowstone cutthroat trout have been established within the historic distributional boundary. These lake populations present an opportunity for a more diverse conservation program. To insure that the relative health (e.g., genetic maintenance, stocking, habitat management, etc.) of these lake populations is maintained, a management protocol will be developed and implemented.

## **Population Restoration**

Conservation of Yellowstone cutthroat trout will require increasing the number of populations. This will be completed by restoring Yellowstone cutthroat to certain streams that were historically occupied and by introductions into certain habitats within historic range that were historically fishless. For each new population, a conservation plan (comparable to the plans developed for current conservation populations) will be developed. These plans will identify actions required to ensure persistence. Monitoring and evaluation of these plans will provide an assessment of population restoration success. Population restoration considerations include:

### **1. Increase the Number of Yellowstone Cutthroat Trout Core Stream Populations.**

The number of core populations will be increased by restoring Yellowstone cutthroat into historic habitat and/or by introducing Yellowstone cutthroat into certain waters that are fishless within the boundary of the historic range. Introductions into fishless waters will be preceded by an analysis of impacts on native biota. Reintroduction of Yellowstone cutthroat may require removal of non-native or hybridized populations. Sources of Yellowstone cutthroat may come from other core populations or the hatchery brood maintained by FWP. Final decisions on what sources to use will be made on a case-by-case basis. Only genetically pure Yellowstone cutthroat sources will be used to restore new populations. In some instances, the restored population will represent a replicate of an existing population; in other situations the hatchery brood will be used as the founder of the new population. In certain situations, the restored population could be founded by using multiple genetically pure sources. Reintroduction may be accomplished through in-stream and streamside incubators, fry and fingerling plants or through the use of adult and juvenile transplants. In the case of adult or juvenile transplants, the founding sources will be required to undergo disease screening to protect against transport and introduction of diseases. To the extent possible reintroduced populations will be done in a manner that allows for development of interconnections of drainages to form metapopulations. No Yellowstone cutthroat trout will be stocked on top of an existing core population.

**2. Maintenance and Use of Hatchery Brood Stock.** Conservation of Yellowstone cutthroat trout will require the maintenance of a hatchery brood as an integral part of this program. Management of the hatchery brood will include consideration of genetic protection and life history concerns, similar to westslope cutthroat trout management. Hatchery-produced fish may be used to establish new core populations through restoration of hybridized populations to virtual purity, to reestablish pure Yellowstone cutthroat in waters where they once existed and to introduce them into certain fishless waters. Hatchery fish will never be stocked to supplement existing core populations. Hatchery programs are costly; therefore, before expansion of the captive-breeding program is initiated, evaluations of this conservation tool will be conducted on experimental introductions in a diversity of environments. The hatchery brood will continue to be a vital component of management of Yellowstone cutthroat in mountain lakes.

**3. Species Removals.** Efforts to restore Yellowstone cutthroat to habitats within the historic range may require removal of hybridized and/or non-native trout. Population removals will, in many cases, require the use of fish toxicants to facilitate removal of the unwanted fish. In other cases, physical removal of non-native trout will be undertaken. In most instances, these species removals will require an environmental analysis. In

instances where chemical removal is necessary, efforts will be undertaken to reestablish the native biota following treatment.

### **Genetic Management**

Genetic purity has been a major consideration that has challenged the conservation efforts for all cutthroat trout. Recently, several western States have come to a consensus of opinion regarding cutthroat management, including how genetic status should be factored into cutthroat management and conservation. The management concept that is being finalized includes three components: (1) core populations that are based on protection and preservation of the Yellowstone cutthroat subspecies in a genetically unaltered condition; (2) conservation populations that are focused on protection and preservation of unique life history and population attributes deemed as significant; and (3) a recreational fishery component that addresses the management of cutthroat trout populations for the primary purpose of fishing.

For this conservation program, populations of Yellowstone cutthroat trout that have been verified as being genetically pure, based on electrophoretic or DNA analysis, will be given the highest priority for conservation as core populations. Use of non-lethal protocol for testing genetic purity will be favored for small populations. The Yellowstone cutthroat trout captive brood maintained in the Montana hatchery system will continue to be managed for genetic diversity and purity. Genetically pure fish are the only ones that can serve as donor sources for restoration, by translocation or by use of the hatchery brood. Validation of genetic purity will be monitored periodically and is a prerequisite for reintroduction. To maintain genetic variation, no stocking will be allowed on top of core populations.

As populations are restored, an effort will be made to replicate the genetics of an existing core population; in other situations the hatchery brood will be used as the founder of a new population. In certain situations, a new conservation population will be founded by using multiple, genetically pure sources.

The conservation program will view slightly hybridized populations (e.g., up to 10% hybridization) as conservation populations. The value of protecting these conservation populations is attached to unique life history or population characteristics and the fact that these populations in some instances represent the best remaining cutthroat populations in a geographical location. Conservation populations may also serve as high priority candidates for core population restoration.

Habitats supporting both core and conservation populations should be given the same level of protection until a final decision on genetic maintenance or restoration is made (including completion of MEPA/NEPA). It is anticipated that most decisions associated with restoration of hybridized populations to a genetically pure condition will occur within the initial term of the program (ten years). Prior to replacement of any hybridized population, an extensive genetic sampling effort will confirm that no genetically pure fish exist within the watershed.

In cases where special adaptive life strategies and/or population characteristics are felt to be significant, conservation populations will be maintained and managed for their special attributes. In these situations, the respective populations will be treated the same as conservation populations with regard to habitat and population management. Montana Department of Fish, Wildlife and Parks and/or the Crow Tribe, with input provided by the respective implementation team and Cooperators, will be responsible for population preservation decisions relative to maintenance of conservation populations.

## **General Fishery Management**

Yellowstone cutthroat trout are an important fish within Montana, and fisheries management will play an important role from both conservation and recreational perspectives. The present "catch-and-release" regulation should be maintained for all core and conservation populations until such time as a greater degree of recovery is attained. At the present time, this "catch-and-release" regulation will not be applied to lake populations and any streams that support and/or are associated with lake populations. For some lakes and streams, there may be the need for more restrictive angling regulations, but this will be determined on a case-by-case basis. A "catch-and-release" regulation may or may not be applied to recreational cutthroat trout fisheries. The ultimate goal of conservation includes the expectation that all Yellowstone cutthroat populations (core and conservation), both stream and lake, will become healthy enough to support some level of angler use and potential harvest. It is also understood that presently, most recreational stream fisheries for Yellowstone cutthroat trout will be based primarily upon management of recreational populations.

Stocking of non-native trout will not be planned or carried out in drainages or portions of drainages that support Yellowstone cutthroat where such stocking has the possibility of impacting a core or conservation population. Stocking of non-native trout will not occur in habitats selected as potential restoration sites. This includes stocking in environments on both public and private land. As an additional safe guard, "state-of-the-art" barriers will be required on all new private ponds within drainages that support core or conservation populations of Yellowstone cutthroat trout. Permitting of new ponds that have the potential to influence core and conservation populations will require stocking of only genetically pure Yellowstone cutthroat trout. FWP will work with existing pond owners to replace non-native trout with Yellowstone cutthroat, where appropriate.

## **Monitoring and Evaluation**

The success of this conservation effort in achieving the stated goal will be contingent upon how judiciously the administrative, organizational and implementation components of the program are carried out. Monitoring will be based on an assessment of how well the program functioned in implementing what was identified to be done, were the actions effective, and validation of the assumptions and relationships that were linked to success. Evaluation criteria include consideration of extant pure populations in comparison to current populations, indicators of population health (e.g., numbers, age class structure, condition, fitness, etc.), and the amount and condition of occupied habitat.

The complete restoration of Yellowstone cutthroat trout within their historic range in Montana is likely not attainable. Many of the factors and influences that have led to the current situation (i.e., reduced distribution, depressed population numbers, altered habitat, nonnative competition, and hybridization) are irreversible in certain situations. This program will focus on situations and circumstances where corrective actions are feasible and realistic. The plan attempts to reduce and/or halt threats to the viability of current populations and to expand and reintroduce new populations sufficient to ensure persistence of Yellowstone cutthroat in Montana, and ultimately, fishable populations.

## **Public Outreach**

The current status of Yellowstone cutthroat trout within its historic range is largely due to a poor understanding of the effects of man's influence on the environment and biotic communities. The decline of Yellowstone cutthroat populations is a direct result of species introductions, habitat alteration and excessive harvest. The success of this conservation program in reaching the stated goal will depend upon informing and educating the public and others who influence management of fish and their habitats. Educational and informational opportunities to further common knowledge will be pursued. A public outreach effort specifically addressing Yellowstone cutthroat trout within their historic range will be cooperatively developed and implemented by the agencies having responsibility for cutthroat conservation. The Conservation Council will facilitate development of an aggressive program of dissemination of information and education on Yellowstone cutthroat conservation. Public outreach efforts will utilize the many and varied options available to get the "story" to the public. All Council members will participate consistent with their roles and responsibilities. It is anticipated that information and education actions will be a component of the annual programs of work for the individual Implementation Teams, the Coordinator and the Council.

## **Definitions**

For the purposes of this Yellowstone Conservation Program, the following terms are defined:

**Conservation Population** - A discrete population of slightly hybridized or introgressed (usually less than 10% hybridization) Yellowstone cutthroat trout that is maintained by natural reproduction and exhibits unique or desired life history or population characteristics.

**Conservation Program** - The overall conservation document (i.e., this document) that sets forth the general conservation philosophy for Yellowstone cutthroat trout in Montana. The document outlines the guiding conservation goal and associated objectives of the conservation program and addresses the administrative, organizational, conservation, informational/educational and research considerations that will be further defined and interpreted during development of population specific conservation plans. The term is interchangeable with Conservation Strategy, Yellowstone Cutthroat Conservation Strategy, and Yellowstone Cutthroat Conservation Program.

**Conservation Council** - An organized body of individuals that will focus on and oversee the conservation efforts in Montana. Membership is primarily composed of representatives of the agencies participating in the Conservation Agreement. Term is interchangeable with working group, steering committee.

**Conservation Agreement** - A basic agreement to participate in the conservation of Yellowstone cutthroat trout. Primary signatories are agencies and governments that have a legal responsibility to preserve and protect fishery resources. Also referred to as the Yellowstone Cutthroat Conservation Agreement. Comparable to the U.S. Fish and Wildlife Service's Candidate Conservation Agreements.

**Core Population** – A discrete population of cutthroat trout that exists in a genetically unaltered (i.e., pure) condition. Genetic testing using approved techniques indicates that hybridization or introgression with other trout species or cutthroat subspecies has not occurred.

**Enhancement** - Actions designed to elevate either habitat and/or fish population attributes to quality and/or quantity levels above those considered natural. In certain situations, it is difficult to separate enhancement from restoration.

**Genetically Pure** - Considered to be without hybridization with other trout species and/or subspecies based on "state-of-the-art" (e.g., electrophoresis and/or DNA analysis) genetic detection techniques. Also referred to as 100% pure. It is understood that purity ratings will be subject to change as techniques for genetic analysis are improved or new techniques become developed. A sample size of at least 25 fish must be analyzed and determined to be pure before a population can be classified as pure for restoration purposes.

**Hatchery Brood** - Those Yellowstone cutthroat trout that are maintained in the hatchery system and the offspring used for introduction and/or restoration purposes. The Yellowstone cutthroat hatchery brood is maintained in a genetically pure condition and regularly infused with wild genes to ensure genetic variability and minimize inbreeding depression.

**Hybrid Cutthroat** - A reproductive "cross breed" with other trout, commonly rainbow trout or other cutthroat subspecies. Used interchangeably with introgressed cutthroat.

**Introduction** - Actions designed and implemented that result in fish being stocked into waters that were historically fishless or void of Yellowstone cutthroat trout.

**Metapopulation** - A collection of localized populations that are geographically distinct yet genetically interconnected through natural movements of individuals among conservation populations.

**Non-Native Trout** - A fish that, historically, did not occur within a specific area or habitat. Also referred to as an exotic trout. Examples in the Yellowstone River basin include rainbow trout, westslope cutthroat trout, eastern brook trout, and brown trout.

**Recreational Fishery** - A population and/or populations of Yellowstone cutthroat trout, irrespective of genetic condition, that provides an opportunity for angling. Angling regulations may be variable and range from "catch-and-release" to some level of harvest.

**Remnant Population** - Any population that has naturally persisted and continues to occur within historically occupied habitats. Remnant populations do not include populations that have been introduced or restored through transplanting or stocking of offspring from a hatchery brood.

**Restoration** - Actions designed to change current habitat and/or fish population attributes to quality and/or quantity levels approximating those considered natural. In certain situations it is difficult to separate from enhancement. When linked to population management, it may be referred to as reintroduction or reestablishment.

**Secure** - Actions associated with protection and long-term maintenance of Yellowstone cutthroat populations.

**Stocking** - The act of releasing fish into the environment.

**Transplant** - Removal of Yellowstone cutthroat from a core population and subsequent release of those individuals into other waters as an introduction or a restoration.

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**Examples of actions associated with implementation of the Yellowstone Cutthroat Conservation Program.**

<b>Conservation Elements and Associated Actions</b>
<p><b><u>Administrative Actions</u></b>            Development of Agreements, Program Document, Lake Mgt. Protocol, etc.            Development of Population Conservation Plans            Coordination with Others</p>
<p><b><u>Organization Actions</u></b>            Conservation Council Participation            Coordinator Activity            Implementation Team Participation</p>
<p><b><u>Population Identification and Genetic Management Actions</u></b>            Field Verification            Genetic Testing            Brood Stock Management</p>
<p><b><u>Population Protection and Maintenance Actions</u></b>            Habitat Surveys and Analysis            Population Surveys and Analysis            Database Maintenance            Barrier Management            Removal of Competing Species            Habitat Restoration and Enhancement            Watershed Restoration and Enhancement            Land-Use Coordination            Population Expansion Efforts            Lake Management</p>
<p><b><u>Population Restoration/Introduction Actions</u></b>            Opportunity Evaluation            Genetic Swamping            Species Replacements            Introductions</p>
<p><b><u>Conservation Information and Education Actions</u></b>            I&amp;E Materials Development            Programs and Presentations            Field Trips/Workshops/etc</p>
<p><b><u>Research Actions</u></b>            Research Investigations (e.g., life history, survival, enhancement evaluations, etc.)</p>
<p><b><u>General Conservation Actions</u></b>            Regulation Development and Enforcement            Private Pond Administration            Habitat Protection (e.g., 310/124 Administration)</p>



Appendix A

**UPPER YELLOWSTONE CUTTHROAT CONSERVATION AREA**

**Area Description:**

This area encompasses the upper drainage area of the Yellowstone River watershed that lies within Montana. A significant portion of the upper watershed is within Yellowstone National Park but this area is not included within this particular effort at this time. This conservation area contains seven 5th order watersheds (e.g., 5th order HUC's). The mainstem Yellowstone River is a significant fishery of national importance. A significant portion of the area is in federal ownership that is administered by the Forest Service.

**Current Status:**

Currently, this conservation area contains 11 known conservation populations that occupy approximately 139 miles of stream. Several lakes within the area contain pure Yellowstone cutthroat trout. The main stem Yellowstone River is currently being evaluated with respect to genetic status. Specific population information will start with the upper most population and move down drainage.

Stream (Population name) -- Drainage Basin	Land Ownership	Other Trout Present – Hybridization Risk	Other Risks	Remarks
Soda Butte Creek -- Tributary to Lamar River, tributary to Yellowstone River.	Gallatin National Forest	Yes, Brook trout – Moderate Risk. Barrier questionable.	Habitat quality and water quality influenced by mining, high sediments, small population size.	Efforts to physically remove brook trout have been marginally effective. Chemical removal being considered.
Pebble Creek -- Tributary to Soda Butte Creek.	Yellowstone National Park	No, Moderate Risk due to Rbt in Lamar River. Barrier questionable.	Isolated	Management responsibility of YNP.
Slough Creek -- Tributary to Lamar River tributary to Yellowstone River.	Gallatin National Forest (headwaters); YNP (lower stream)	No, Low Risk. Substantial barrier.		

Stream (Population name) -- Drainage Basin	Land Ownership	Other Trout Present – Hybridization Risk	Other Risks	Remarks
Darroch Creek -- Tributary to Bear Creek, tributary to Yellowstone River.	Gallatin National Forest	Yes, Rbt and Yct (hybrid) – High Risk.	Small population size, isolated, limited amount of habitat.	There is a possibility that this population has been invaded by rainbow trout.
Mulherin Creek -- Tributary to Yellowstone River.	Gallatin National Forest, YNP, Private land	Yes, Rbt and Yct (hybrid) – Extreme Risk. Barrier questionable.	Small population, irrigation diversions, isolated.	Land exchange proposal may have negative effect. Likely needs barrier.
Tom Miner Creek -- Tributary to Yellowstone River.	Gallatin National Forest, Private land	Yes, Rbt and Brown Trout – Extreme Risk. Barrier questionable.	Land uses influencing habitat quality, diversions, moderate population size, isolation.	Three small tributaries support Yct. Need to reevaluate genetics. Need to determine if barrier needed.
Rock Creek – Tributary to Yellowstone River.	Gallatin National Forest, Private land	Yes, Rbt and Brown Trout. Low Risk. Barrier viewed as secure.	Habitat quality fair, moderate population size, population isolated.	Barrier associated with falls/cascade. Potential barrier associated with culvert w/ train tracks. Road rehabilitation has taken place.
Donahue Creek -- Tributary to Yellowstone River.	Gallatin National Forest, Private land	No, Low Risk. Channel dewatered.	Very small population, poor habitat, population isolated.	Possibility of expanding population into Little Donahue.
Sixmile Creek -- Tributary to Yellowstone River.	Gallatin National Forest, Private land	Yes, Brown trout -- High Risk. Barrier questionable.	Fair habitat, competition with brown trout, moderate population size, population isolated.	Habitat enhancement completed in 1998. Need to consider removal of brown trout. Potential need for barrier enhancement.

Stream (Population name) -- Drainage Basin	Land Ownership	Other Trout Present – Hybridization Risk	Other Risks	Remarks
Fridley Creek -- Tributary to Yellowstone River.	Gallatin National Forest, Private land	Yes, Rbt and Yct (hybrid) -- Low Risk. Barrier viewed as secure.	Population of moderate size, habitat good, population isolated.	Access to stream limited. Need to collect additional population/habitat information.
Mill Creek -- Tributary to Yellowstone River.	Gallatin National Forest, Private land	Yes, Rbt and brown trout -- Moderate Risk. Barrier may not be 100% effective.	Habitat good, population size moderate, land uses having some influence, population isolated.	Barrier at FS boundary has been installed. Movement study is needed. Considerable habitat enhancement completed.
Suce Creek -- Tributary to Yellowstone River.	Gallatin National Forest, Private land	Yes, Rbt and Brook trout – High Risk. Barrier questionable.	Habitat fair, moderate population size, isolated.	Population is within wilderness.

## **SHIELDS RIVER AND CRAZY MOUNTAIN CONSERVATION AREA**

### **Area Description:**

This section of the conservation effort encompasses that portion of the Yellowstone River drainage beginning just up stream from Livingston, MT down to just below Big Timber, MT. This conservation area includes thirteen 5th order watersheds.

### **Current Status:**

There are 18 known conservation populations that occupy 248 miles of stream. There are also number lakes that support pure Yellowstone cutthroat trout.

Stream (Population name) – Drainage Basin	Land Ownership	Other Trout Present -- Hybridization Risk	Other Risks	Remarks
Upper Billman Creek – Tributary to Yellowstone River.	Population all on private land.	No -- High Risk. Barrier questionable.	Habitat quality poor, moderate population size, isolation.	Riparian and watershed influenced by agriculture. Lower stream dewatered.
Miner Creek – Tributary to Billman Creek.	Population all on private land.	No -- Moderate Risk. Barrier questionable.	Habitat quality fair, moderate population size, growth and survival somewhat influenced by habitat conditions. Isolated.	Population occupies short reach of stream. Potential for connecting with Billman Creek population.
Mill Fork Mission Creek – Tributary to Mission Creek, tributary to Yellowstone River.	Gallatin National Forest and private land.	No -- Extreme Risk. Barrier has been compromised.	Habitat quality and quantity poor, very small population, isolated population.	Land uses have caused significant habitat impairment. Barrier enhancement may have been negated by debris.
North Fork Willow Creek – Tributary to Willow Creek, tributary to Shields River.	Gallatin National Forest	No -- High Risk. Barrier questionable.	Very poor habitat condition, moderate population size, growth and survival low, isolated.	Land uses have caused significant habitat impairment (primarily grazing and timber harvest), recent channel stabilization implemented with more planned. Land exchange to FS will be beneficial.

Stream (Population name) – Drainage Basin	Land Ownership	Other Trout Present -- Hybridization Risk	Other Risks	Remarks
Bangtail Creek – Tributary to Shields River.	Gallatin National Forest and private land.	Yes -- High Risk. Barrier questionable. Competing species in drainage.	Habitat condition poor, moderate population size, sediment and temperate having effect, isolated population.	Land uses having detrimental influence. Viability being influenced.
Rock Creek – Tributary to Shields River.	Gallatin National Forest	No -- Moderate Risk. Barrier questionable.	Channel instability, poor habitat, moderate population size, population isolated.	Private pond in drainage.
Brackett Creek -- Tributary to Shields River.	Gallatin National Forest	Yes -- High Risk. Barrier questionable. Competing species in drainage.	Habitat quality poor to fair, high sediment, moderate population size, population isolated.	Land use impacts generating moderate concern for viability. Minor channel stabilization planned.
Flathead Creek – Tributary to Shields River.	Gallatin National Forest and private land	Yes -- High Risk. Barrier questionable. Competing species present.	Habitat quality poor to fair, high sediment, may have high temperatures, good population size, isolated.	Agricultural land use impacting habitat. Diversions. More information on distribution needed.
Upper Shields River -- Tributary to Yellowstone River.	Gallatin National Forest	Yes -- Brook Trout. High Risk. Barrier questionable. Rbt in lower drainage.	Habitat quality poor, channel unstable, good population size, isolated population.	Timber harvest substantial. Several small tributaries have populations. Possibility for population expansion to include Smith Creek.
Smith Creek – Tributary to Shields River, tributary to Yellowstone River.	Gallatin National Forest	Yes -- Brook trout (possibly). High Risk. Barrier questionable.	Habitat quality and quantity limited, moderate population size, poor growth and survival, population isolated.	Land use impacts having negative influence. Heavy timber harvest and grazing.

Stream (Population name) – Drainage Basin	Land Ownership	Other Trout Present -- Hybridization Risk	Other Risks	Remarks
S. Fork Little Timber Creek – Trib. to Little Timber Creek, tributary to Yellowstone River.	Gallatin National Forest and private land	Yes -- Brook and brown trout. Moderate Risk.	Habitat quality and quantity poor to fair, moderate population size, population isolated.	Land uses influences minimal.
South Fork of Big Timber Creek -- Tributary to Big Timber Creek, tributary to Yellowstone River.	Gallatin National Forest and private land	Yes -- Rbt, brown and brook trout. High Risk. Barrier questionable.	Habitat quality general good, good population size, good growth and survival, population isolated.	Land uses influences minimal.
East Boulder River -- Tributary to Boulder River, tributary to Yellowstone River.	Gallatin National Forest	No -- Low Risk. Significant barrier.	Habitat quality good, moderate population size, population isolated.	Significant portion of population in wilderness. Population has been used as donor to Bad Canyon Creek.
Upper Boulder River – Trib. to Yellowstone Riv	Gallatin National Forest	No --Moderate Risk. Barrier questionable.	Habitat quality fair, small population size, isolated.	Land uses having minimal impact.
Hawley Creek -- Tributary to Boulder River, tributary to Yellowstone River.	Gallatin National Forest	No -- Low Risk. Cascade passage barrier.	Habitat quality and quantity poor, high gradient,small population, isolated population.	No land use impacts. Population likely maintained by fish from headwater lake.
Bridge Creek -- Tributary to Boulder River, tributary to Yellowstone River	Gallatin National Forest	No -- Low Risk. Significant barrier.	Small population size, moderate habitat quality, population isolated.	No land use impacts.
Upper Deer Creek -- Tributary to Yellowstone River.	Gallatin National Forest	Yes -- Brook trout. Rainbow in lower drainage. High Risk. Barrier questionable.	Habitat conditions poor to fair, high gradients, moderate population size, isolated population.	Minor land use impacts from timber harvest and grazing.
Lower Deer Creek -- Tributary to Yellowstone River.	Gallatin National Forest	Yes -- Brown trout. Rainbow in lower drainage. Moderate Risk.	Habitat quality and quantity fair, moderate population size, population isolated.	Expansion of population into stream above barrier. Evaluation of success needed.

## MIDDLE YELLOWSTONE CONSERVATION AREA

### Area Description:

This conservation area includes the main stem Yellowstone River from the confluence with Sweetgrass Creek downstream to the confluence of the Clarks Fork of the Yellowstone River. There are twenty 5th code watersheds represented.

### Current Status:

Only streams contain conservation populations and the amount of occupied habitat is    miles. Several populations need further genetic analysis.

Stream (population name) – Drainage Basin	Land Ownership	Other Trout Present -- Hybridization Risk	Other Risks	Remarks
Bad Canyon Creek -- Tributary to Stillwater River, tributary to Yellowstone River.	Custer National Forest and small amount of BLM and private land	Yes -- Brown trout. Low Risk. Significant barrier.	Habitat in fair to good condition, very small population size, species competition, isolated.	Efforts to remove brown trout initiated in 1993, partially successful. Stocked with Yct from East Boulder River.
Brushy Fork – Tributary to Willow Creek, tributary to Redlodge Creek.	Private land.	Yes -- Moderate Risk. Barrier uncertain.	Poor habitat quality and quantity, very small population, isolated population.	Totally within private land. Only 2.4 miles of stream occupied.

## LOWER YELLOWSTONE CONSERVATION AREA

Area Description: This is the eastern most extension of Yellowstone cutthroat habitat. There are thirty-six 5th code watersheds.

Current Status: Six streams contain conservation populations and these populations occupy 23 miles of habitat.

Stream (Population name) – Drainage Basin	Land Ownership	Other Trout Present -- Hybridization Risk	Other Risks	Remarks
Piney Creek – Tributary to Sage Creek, tributary to Bighorn River.	Private	No -- Low Risk. Stream diverted for irrigation.	Stream small but with good habitat, spring controlled, very small population, isolated.	Population may not be viable due to small size. Only 1.5 miles of stream occupied.
Crooked Creek – Trib. to Sage Creek, tributary to Bighorn River.	Custer National Forest	Yes -- Rbt, brown, and brook trout. High Risk. Barrier questionable.	Habitat in generally good condition, moderate population size, isolated.	Very remote area. Barrier inspection to be completed in 1999.
Hay Creek – Tributary to Pryor Creek, tributary to Yellowstone River.	Crow Reservation	Yes -- Brook trout. Rainbow present in Pryor Creek. Barrier questionable.	Habitat in fair to good condition, moderate population size, isolated population.	Land use not identified as a problem.
Dryhead Creek -- Tributary to Bighorn River.	Crow Reservation and private land	Yes -- Brown trout. Moderate Risk. Barrier questionable. Irrigation diversion.	Very poor habitat quality, extremely small population (occupied only two to three pools), population isolated.	Grazing having substantial impact to habitat. Effort to expand population to upper drainage underway.
Rotten Grass Creek -- Tributary to Bighorn River.	Crow Reservation	Yes -- Rbt and brown trout. Low Risk. Significant barrier.	Habitat quality and quantity fair, moderate population size, isolated population.	This population will likely be used as a donor source for population restoration.
Big Bull Elk Creek -- Tributary to Bighorn River.	Crow Reservation	Yes -- Brown trout. High Risk. Barrier questionable. Rainbow in reservoir.	Habitat in good condition, moderate population size, population isolated.	This population will likely be used as a donor source for population restoration.

## **Appendix B**

### **Population Conservation Plans**

To insure that conservation and preservation becomes a reality for Yellowstone cutthroat trout, more site-specific attention must be directed toward each population. The development and implementation of population specific conservation plans will provide needed specificity on habitat condition, population health, land and recreational uses that influence long term preservation.

Each population plan will contain pertinent information and direction necessary for the protection, conservation and enhancement of the specific population. These plans will contain information on current conditions, they will define specific goals and objectives, they will identify land use coordination needs, they will identify actions and set timelines for accomplishment, address budgetary needs, focus on monitoring and evaluation and identify specific roles and responsibilities. It is anticipated that each plan will be evolutionary and changeable through time. Updates will occur as the status of each population changes.

The following is an example of simple population conservation plan.

# Dry Head Creek Population

## Yellowstone Cutthroat Trout

### Conservation Plan

Custer NF/ Region 5, MFWP/USFWS, Montana Assistance Office

January, 1999

#### Introduction

The intent of this plan is to serve as a guide for protection and management of a genetically pure population of Yellowstone cutthroat trout inhabiting Dry Head Creek located on the eastern edge of the Pryor Mountains (T7S, R28E, Sec 7). Dry Head Creek is a tributary to the Bighorn Reservoir which is within the Bighorn River Drainage (Figure 1. Vicinity map).

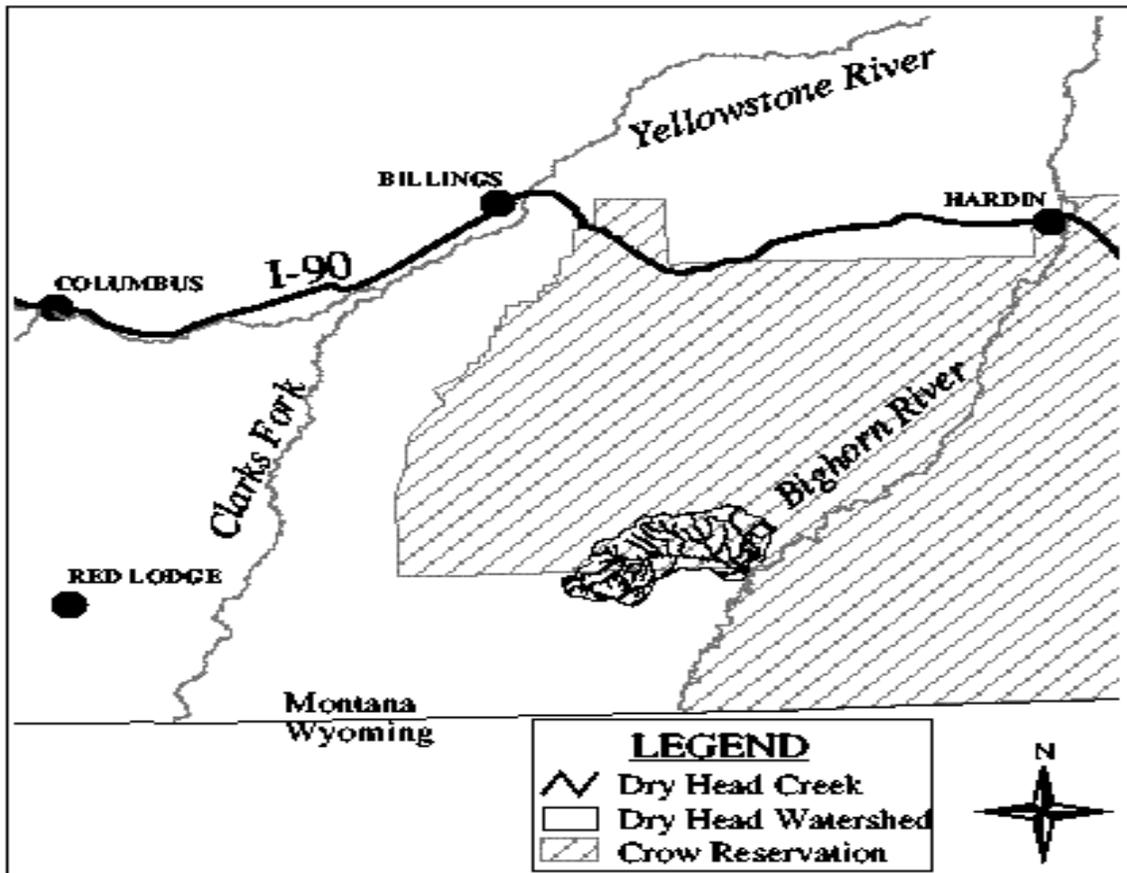


Figure 1: Dry Head Creek general vicinity map.

The Headwaters of Dry Head Creek originate on the Custer National Forest and flow in an easterly direction prior to entering Bighorn Reservoir. Land ownership within the Dryhead watershed includes the US Government (Custer National Forest), the Crow Tribe, the State of Montana and several private owners. The Dry Head watershed covers 63,407 acres and has an estimated 130 miles of perennial and intermittent stream course. Primary tributaries to Dry Head Creek include Hoodoo, Pitchfork, Spring and Flat Creeks which originate on Crow Tribal lands on the northern portion of the watershed. Punchbowl and East Fork of Dry Head Creek originate on the Custer National Forest and Clabber Creek, within private lands that are on the southern portion of the watershed. In general, annual precipitation is moderately low and as a result, most stream channels within the watershed are intermittent in nature. Dry Head Creek, the largest perennial stream within the watershed, has had several irrigation diversions that were used to supply water to small areas of adjacent agricultural land. At present, most of the agricultural lands are not being used to produce cultivated crops. Livestock grazing is the principle land use within the upper portion of the watershed.

### **Historical Considerations**

From a historical perspective, the Dry Head watershed likely supported a population of Yellowstone cutthroat trout that occupied a substantial portion of Dry Head Creek and the lower portions of Hoodoo, Pitchfork and Spring Creeks. The exact nature of historical Yellowstone cutthroat occupancy is not known but it has been estimated that 21 miles of stream would have had a high probability of supporting cutthroat. No scientific information is known to exist that would provide historic information on the nature of the cutthroat population or the habitat that supported the population. There may be personal journals in existence that contain anecdotal information on cutthroat within the Dry Head watershed, but none have been located to date. Stocking records indicated that rainbow trout have been planted into lower Dry Head Creek.

### **Current situation**

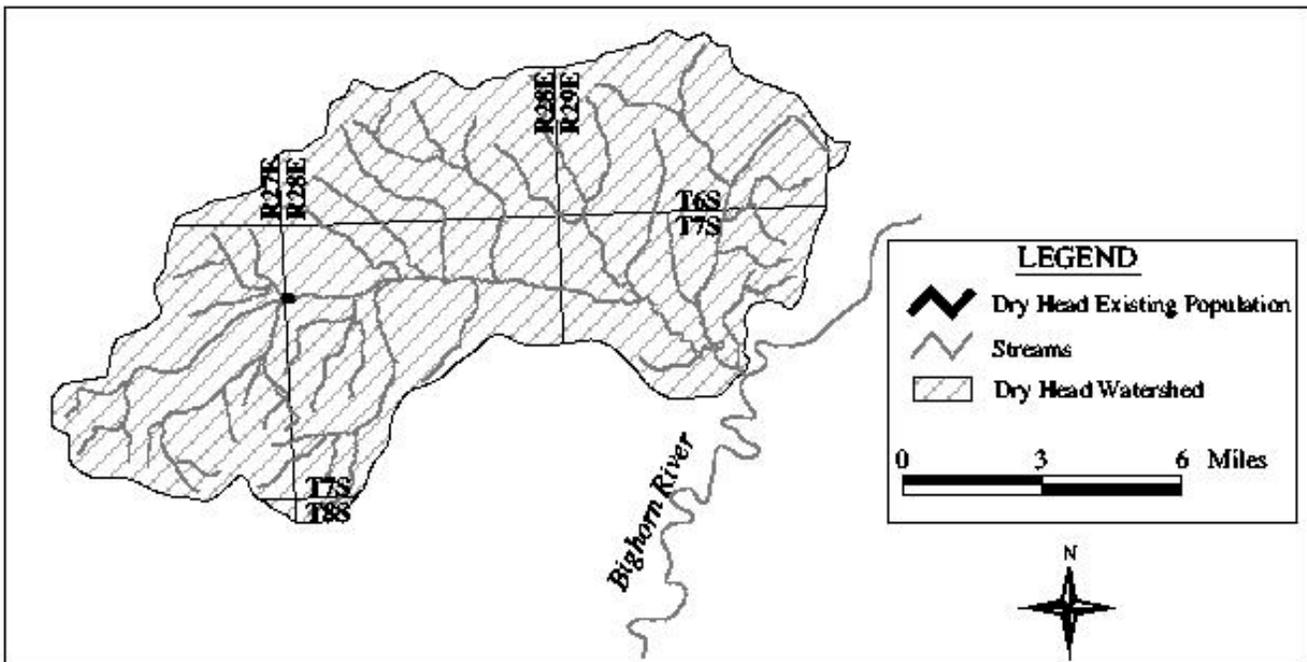
The current Yellowstone cutthroat trout population in Dry head Creek occupies a relatively small portion of the upper stream near the confluence of Punchbowl Creek. In 1992, efforts to find cutthroat within Dry Head and Punchbowl Creeks were unsuccessful. Follow up population surveys in 1993 and 1994 located a very small population that was occupying several pools in section 7 near the confluence of Punchbowl Creek with main Dry Head Creek. Fish densities were so low that the sample removed for genetic testing had to be limited to four individuals. Results of the genetic testing verified that the four individuals were genetically pure Yellowstone cutthroat trout. While a population estimate was not made it is highly likely that the current population reflects as few as 10 to 15 individuals and not likely more than 50 individuals. At present, it has been estimated that only 0.28 miles of Dry Head Creek have cutthroat trout present (Figure 2. Watershed map). An evaluation of the current status of this population indicated that the risks of extinction due to hybridization were moderate and the risks due to other deterministic and stochastic factors were extreme. Temporal variability in recruitment and survival, extremely small population size, harsh conditions associated with growth and survival, and population isolation were all rated as being extremely negative. A reconnaissance of the upper portion of Dry Head Creek in 1996, within the Custer National Forest, yielded no observations of fish even though habitat conditions (e.g., flows, temperature, habitats, etc.) were sufficient to support trout.

Habitat conditions within Dry Head Creek range from marginal in the lower portion of the drainage to reasonably good in the upper portion of the watershed. These habitat assessments are primarily based on visual inspections made during the 1992-1994 site visits. Flow, temperature,

and general habitat conditions in the lower portions of Dry Head Creek are mostly marginal for supporting trout. Irrigation diversions were noted in the lower stream section during the 1992 survey. Current information indicates that brown trout are present in the lower stream sections. These brown trout most likely moved up stream from the Bighorn Reservoir. Habitat conditions were observed as being somewhat better in the upper portions of the watershed. In the stream section, which is known to support Yellowstone cutthroat, general habitat conditions were somewhat improved over conditions in the lower portion of the stream. The stream within this area had slightly higher channel gradients, the valley bottom was more confined, temperatures were likely less extreme, flows more stable and there were several larger pools providing holding habitat for cutthroat trout. Yellowstone cutthroat were the only trout observed in this area. Even though rainbow trout were stocked in Dry Head Creek the extent of current occupancy is unknown and they may not have survived. During an inspection of upper Dry Head Creek in 1996, general habitat conditions were observed as being relatively good. Several falls were noted and no fish were encountered during electro fishing. The general nature of the upper stream reflected conditions, which would support trout. It is probable that the upper portion of Dry Head Creek has been historically fishless due to several natural barriers to fish migration that were observed in 1996.

The upper portion of Dry Head Creek, within the Custer National Forest, also has several in holdings of private land, which appears to be used primarily for recreational purposes. A small pond had been constructed on main Dry Head Creek but this pond had essentially filled with fine sediments and was not supporting fish. The stream above and below this pond was electro fished in 1992 and no fish were found.

The Dry Head Creek westslope population has likely maintained genetic purity due to several interrelated factors. The presence and operation of irrigation diversions have likely controlled up stream migration of fish from Bighorn Reservoir and this when coupled with higher water temperatures and minimal habitat quality conditions have created less than ideal conditions for supporting trout populations. In addition, it is likely that past rainbow trout introductions were unsuccessful due to the extreme habitat conditions and the limited nature of stocking effort.



**Figure 2: Dry Head Creek watershed map.**

### **Conservation Goals and Associated Actions**

Consistent with the basic conservation goal associated with Yellowstone cutthroat trout, which provides for ensuring the persistence of the Yellowstone cutthroat subspecies within the historic range at levels and under conditions that provide for protection and maintenance of both intrinsic and recreational values, this conservation plan focuses on ensuring the presence of Yellowstone cutthroat within Dry Head Creek. It is highly unlikely that the population will ever be viewed as a significant recreational fishery, but it is likely that a conservation population of Yellowstone cutthroat trout can be maintain within the Dry Head Creek watershed.

**Goal: Provide for the long-term conservation (existence of a viable population) of Yellowstone cutthroat trout within the Dry Head Creek watershed.**

#### **Conservation Actions**

##### **1. Preservation of Population Integrity.**

A more in-depth analysis of migration into the watershed from Bighorn Reservoir is needed and this should be conducted as soon as possible. Starting in the headwater on the Custer NF, a detailed survey of Dry Head Creek downstream to the Bighorn Reservoir should completed. This survey should also include the primary tributaries within the watershed. The survey should include identification of all current barriers, potential barriers, general riparian condition, general habitat condition, fish presence and abundance. The information gained from the survey should be analyzed and conservation recommendations developed.

Specific attention should be given to potential barrier locations in the lower drainage. Pending the outcome of the survey, final decisions relative to a barrier to secure the population will be made.

## **2. Addition of Genetically Pure Yellowstone Cutthroat Trout to the Existing Population.**

The existing population is so drastically low that concerns for genetic "bottle necking" warrant consideration of increasing the genetic variability of the current population. The intent would be to use nearest neighbors (Big Bull Elk Creek, Rotten Grass Creek and/or Crooked Creek) as donor sources of individuals that would add genetic material to strengthen the population's ability to persist. Benefits would also be associated with having a higher number of spawning fish for the population to build from. This action would require use of a helicopter to facilitate transportation of fish from the donor population(s) and electro fishing and/or "hook and line" techniques to capture the fish.

## **3. Expansion of Yellowstone Cutthroat Trout into Habitat within the Custer National Forest and to the Major Tributaries that are Currently Unoccupied.**

The intent would be to use nearest neighbors (Big Bull Elk Creek, Rotten Grass Creek and/or Crooked Creek) as a donor source of individuals to introduce into the fishless habitat. If sufficient numbers from these sources were not available, use of the hatchery brood to supply fish would be considered. This action would require use of a helicopter to facilitate transportation of fish from the donor population(s) and electro fishing and/or "hook and line" techniques to capture the fish. Prior to initiation of the expansion efforts, an assessment of invertebrates, amphibians and other aquatic biota would be completed to determine if unusual species are present. MEPA analysis will likely be required to accomplish this part of the conservation plan.

### **Implementation Schedule and Responsibilities**

The projected timing for the conservation actions is based on known and/or the likely scheduling of activities by cooperators, along with consideration of the complexity of coordination with private landowners, and the likelihood of funding for conservation action.

**1999** -- Complete verification of genetic purity of Big Bull Elk, Rotten Grass, and Crooked Creek donor populations through electrophoretic analysis by University of Montana genetics lab, Fish from Big Bull Elk and Rotten Grass Creeks collected 11/98. Fish from Crooked Creek scheduled to be collected in 1999. FS and FWS.

**1999** -- Complete appropriate environmental analysis (MEPA) associated with supplemental stocking and introduction into fishless portion of Dry Head Creek. MFWP would lead on introduction in upper Dryhead Creek.

**1999** -- Complete a survey of Dry Head Creek and major tributaries from the headwaters downstream to Bighorn Reservoir. Analysis of information and development of recommendations. FWS, Crow Tribe, FS and FWP.

**2000** -- Consistent with conservation recommendations, design and install isolation barrier. Removal of brown trout. FWP, FWS, Crow Tribe, FS.

**2000 -- 2002** -- On an annual basis collect fish from donor streams and transplant them into the respective sections of Dry Head Creek and tributaries. FWS, MFWP and FS

**2003** -- Complete an effectiveness evaluation to describe the degree of success associated with implementation of the conservation actions. FS, MFWP and FWS.

**2004** -- Review and update Dryhead Creek population conservation plan. FWP, FS, FWS, and Crow Tribe.

**Conservation Plan Budget**

Cost estimates are very preliminary and will vary depending on alternate funding sources, cooperators, and specific project designs.

<b>Activity Estimate</b>	<b>Cost</b>
=====	
Genetic Analysis (for 10/98 collection including Helicopter)	\$ 2,500
MEPA Analysis	\$ 1,500
Dry Head Habitat and Population Survey (including analysis and development of conservation recommendations)	\$ 2,500
Isolation Barrier	\$ 6,000
Yellowstone Cutthroat Transplants	\$ 23,500
Effectiveness Evaluation	<u>\$ 1,500</u>
<b>TOTAL</b>	<b>\$ 37,500</b>

**Possible Supporting Entities (Partners)**

USFW Foundation (Bring Back the Natives), Montana Future Fisheries Initiative, Bureau of Reclamation, Bighorn Canyon Recreation Area, Montana Trout Foundation, FS Cutthroat Trout Conservation Initiative, MFWP/FS/FWS fishery program budgets, Trout Unlimited, FFF, BIA and others.

**Prepared and Reviewed By: Lower Yellowstone River Conservation Unit Implementation Team**

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**By:** \_\_\_\_\_

Beartooth District Ranger, Custer NF

**Accepted**

**By:** \_\_\_\_\_

MFWP Region 5 Supervisor, Montana Fish, Wildlife and Parks

**Accepted**

**By:** \_\_\_\_\_

Montana Assistance Office, US Fishand Wildlife Service

Appendix C

**USDA Forest Service Northern Region Land Use Strategy For  
Implementation of the “*Conservation Agreement and Conservation Plan  
for  
Yellowstone Cutthroat Trout in Montana*”**

In Development.....