2300 Lake Elmo Drive
Billings, MT 59105
July 9, 2004

TO: Environmental Quality Council
Director's Office, Dept. of Environmental Quality
Montana Fish, Wildlife & Parks

Director's Office	Wildlife Division
Resource Assessment	Design & Construction
Fisheries Division	Legal Unit
Parks Division	Lands Section
Regional Supervisors	Piscicide Committee

Montana Historical Society, State Preservation Office
Janet Ellis, Montana Audubon Council
Montana Wildlife Federation
Montana State Library
George Ochenski
Commissioner Dan Walker
Montana Environmental Information Center
Sharon Moore, DNRC Area Manager, Southern Land Office
U.S. Fish and Wildlife Service
American Fisheries Society, Montana Chapter
Yellowstone River Parks Association
Magic City Fly Fishers
Federation of Fly Fishers
Walleyes Unlimited, Billings Chapter
Montana Pike Masters, Billings Chapter
Adjacent Landowners

Ladies and Gentlemen:

A draft Environmental Assessment (EA) has been prepared for the proposed removal of eastern brook trout from the Soda Butte Creek drainage in an effort to protect a self-sustaining population of native Yellowstone cutthroat trout upstream from and within Yellowstone National Park. Both chemical treatment and electrofishing would be used.

The EA can be viewed on the Fish, Wildlife and Parks website (http://fwp.state.mt.us) under Public Notices. If you would like a copy mailed to you please contact the Region 5 headquarters at (406) 247-2961. A public meeting to discuss the proposed project will be held at the fire hall in Cooke City at 7:00 p.m. on Tuesday, July 20.

Any questions about this project should be directed to Jim Olsen (328-4636) or Jim Darling (247-2961). Comments should be addressed to the undersigned by August 6, 2004.

Sincerely,

Harvey E. Nyberg
Regional Supervisor
hnyberg@state.mt.us

MONTANA FISH, WILDLIFE AND PARKS
FISHERIES DIVISION
Draft
ENVIRONMENTAL ASSESSMENT
YELLOWSTONE CUTTHROAT TROUT
RECOVERY PROJECT IN SODA BUTTE CREEK

PART 1. PROPOSED ACTION DESCRIPTION

A. Type of Proposed Action: Montana Fish, Wildlife and Parks (FWP) is proposing to use the piscicide antimycin along with electrofishing to remove non-native brook trout from the upper portions of Soda Butte Creek in an effort to restore Yellowstone cutthroat trout (YCT). This YCT recovery project will help secure and increase the number of genetically pure Yellowstone cutthroat trout as a part of the overall plan to identify, protect, and restore populations in and around the Gallatin and Custer National Forests. Physical removal by electrofishing alone has been unsuccessful. This proposed action will involve 3-4 phases beginning in September of 2004 and ending in 2007.

B. Agency Authority for the Proposed Action: FWP "…is hereby authorized to perform such acts as may be necessary to the establishment and conduct of fish restoration and management projects…" under statute 87-1-702.

C. Estimated Commencement Date: September 7, 2004.

Estimated Completion Dates:
Phase 1 - Initial treatment of the stream: September 2004
Phase 2 - Mechanical removal: Fall 2004, Spring/Summer 2005
Phase 3 - Monitoring: Summer 2006-2007
(Phase 4): if needed

Current status of project design: (% complete): 90%

D. Name and Location of the Project:

Soda Butte Creek is a tributary of the Yellowstone River that originates on public lands in a draw approximately 2 miles east of Cooke City, Montana (T9S R14E Sections 30, 29; N45.01, W10954). The main creek supports both brook trout and Yellowstone cutthroat trout. A small unnamed tributary crosses under US Highway 212 at N45.01 52.3, W109.54 15.3 from the northeast and enters Soda Butte Creek. This tributary harbors an abundant brook trout population that can migrate downstream into Soda Butte Creek, threatening the population of cutthroat trout through competition and predation. To reduce competition between these two species and to provide some relief to the cutthroat trout population, attempts have been made to remove the brook trout population physically by electrofishing, but complete brook trout removal has not been successful. The proposed action is to remove brook trout from Soda

Butte Creek and the tributary north of the highway; the tributary will be chemically treated with antimycin, and brook trout will be removed from the stream downstream of the Highway 212 culvert into Yellowstone Park using electrofishing.

E. Project Size (acres affected)

1. Developed/residential – 0 acres
2. Industrial – 0 acres
3. Open Space/Woodlands/Recreation – 0 acres
4. Wetlands/Riparian – 0 acres; 4-6 miles of stream
5. Floodplain – 0 acres
6. Irrigated Cropland - 0 acres
7. Dry Cropland – 0 acres
8. Forestry – 0 acres
9. Rangeland – 0 acres
10. Other – 0 acres

F. Narrative Summary of the Proposed Action and Purpose of the Proposed Action.

1. Summary of the Proposed Action:

Soda Butte Creek originates 2 miles east of Cooke City, MT, just to the east of Yellowstone National Park (Figures 1 and 2). The main stream then flows through the McClaren Mine tailings prior to entering Cooke City. Miller Creek, the first main tributary, enters the creek in this vicinity and approximately doubles the flow. The stream then flows through Cooke City where Woody Creek enters and again nearly doubles the flow. Sheep Creek is the final major tributary to the creek before it reaches Silvergate and enters Yellowstone National Park. Soda Butte Creek harbors a population of Yellowstone cutthroat trout. Brook trout are also present in the stream and were likely introduced into the creek some time prior to 1974. Neither FWP or the Wyoming Game and Fish Department (WGF) have any record of stocking brook trout in the Soda Butte Creek drainage, and the origin of the first fish plants remains unknown. In 1989, 25 cutthroat trout were collected from Soda Butte Creek near Silvergate to determine their genetic purity. Of the 25 fish analyzed, 20 were pure Yellowstone cutthroat trout, 4 were first generation hybrids with westslope cutthroat trout, and 1 was a pure westslope cutthroat trout. The origin of the westslope cutthroat trout in the drainage is also unknown. To determine the distribution of YCT and brook trout within the drainage, a study was initiated in 1994 by the US Forest Service (USFS), FWP, WGF and the National Park Service (NPS) (Shuler 1995). Results of the study indicated that the tributaries to upper Soda Butte Creek before it enters Yellowstone Park were primarily fishless, except at areas near their confluence with the mainstem creek. These streams included: Miller Creek, Woody Creek, Hayden Creek, Republic Creek, Sheep Creek and Guitar Lake. Therefore, the mainstem of Soda Butte Creek appears to be the current source of brook trout in system. Initial population surveys conducted in the 1970’s suggested that brook trout abundance was very low in the creek, and that brook trout appeared to be restricted to areas upstream from Silvergate. Anecdotal evidence from anglers suggests that brook trout were present from Yellowstone National Park upstream to the headwaters of the creek, but in annual fish population surveys conducted within the Park, no brook trout were ever captured.

Brook trout pose a threat to YCT because they compete with and, to a limited degree, prey upon this native species. In other streams where degraded habitat conditions occur in combination with the presence of a nonnative competitor/predator, the result can be a dramatic reduction in the native fish species, or even complete removal of natives. Until recently, the numbers of brook trout were very low and appeared to be confined primarily to the areas upstream of the McClaren tailings pile. The acid mine drainage from the tailings pile had apparently limited the dispersion of brook trout to areas farther downstream. In 2003, NPS biologists confirmed that brook trout have expanded downstream into the park.

Initial attempts were made in the 1990's to remove brook trout from upper Soda Butte Creek using electrofishing (Poore 2000). The reach from the confluence of Woody Creek upstream to Highway 212 was electrofished, and all brook trout encountered were removed. Subsequent samplings found that the brook trout persisted in the stream despite this effort. The numbers and sizes of fish captured after removal efforts indicated a source of natural reproduction farther upstream than the initial removal area. A search for this source implicated a small unmapped tributary that flows under Highway 212 entering the main stream from the north, near its origin (Figure 1). The tributary originates east of the Goose Lake Jeep trail near Fisher Creek (Figure 3). It flows approximately 1 to 2 miles before converging with another spring below the Highway 212 culvert. The culvert under Highway 212 is a barrier to upstream fish passage, because the outflow is perched approximately 3 ft above the elevation of the streambed, and there is no pool below the culvert that fish could use to jump from (Figure 4). Therefore, it is likely that brook trout were introduced into the stream above this location (Figure 5). There are no YCT upstream from the Highway 212 culvert.

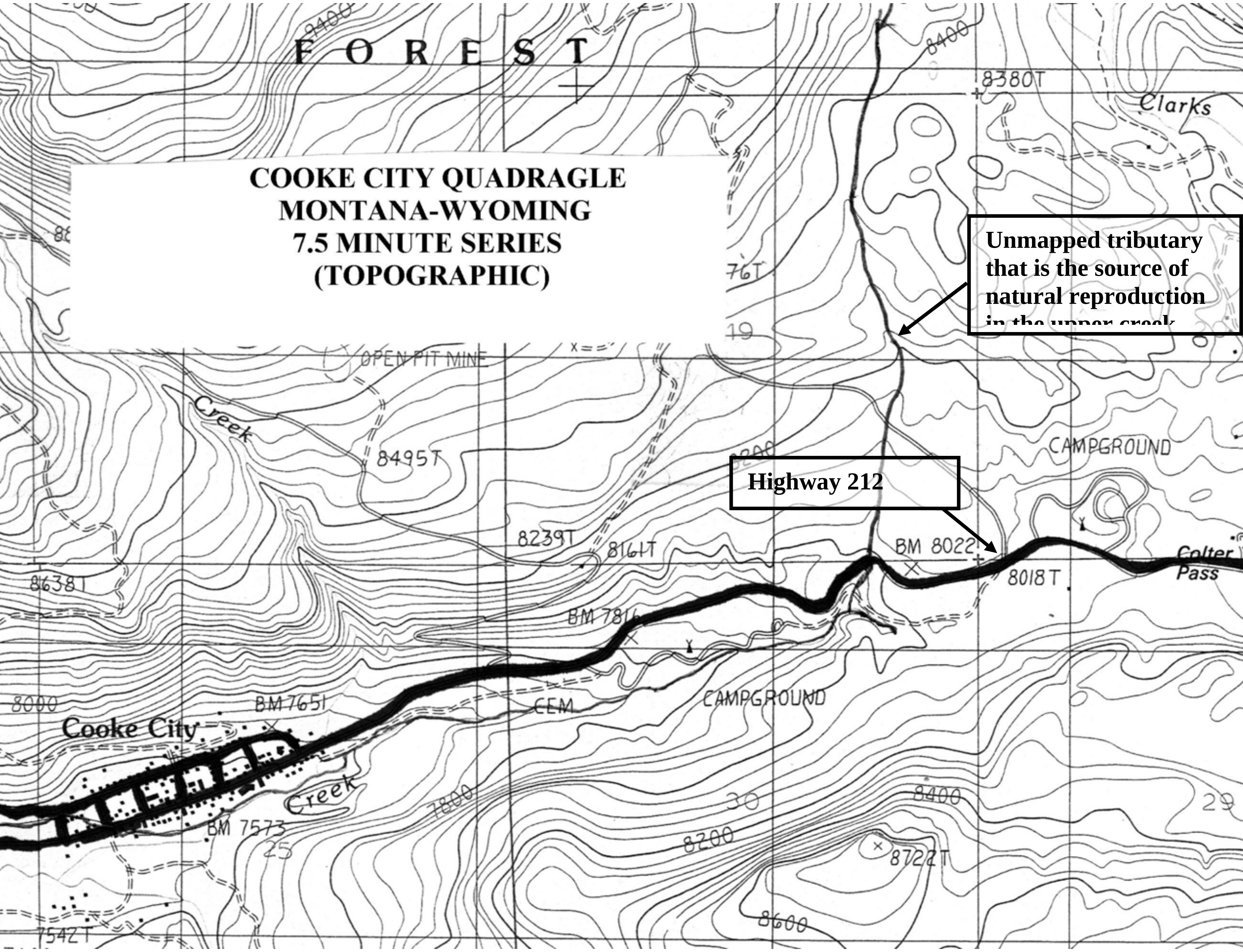


Figure 1. Soda Butte Creek, and the unmapped tributary north of Highway 212.

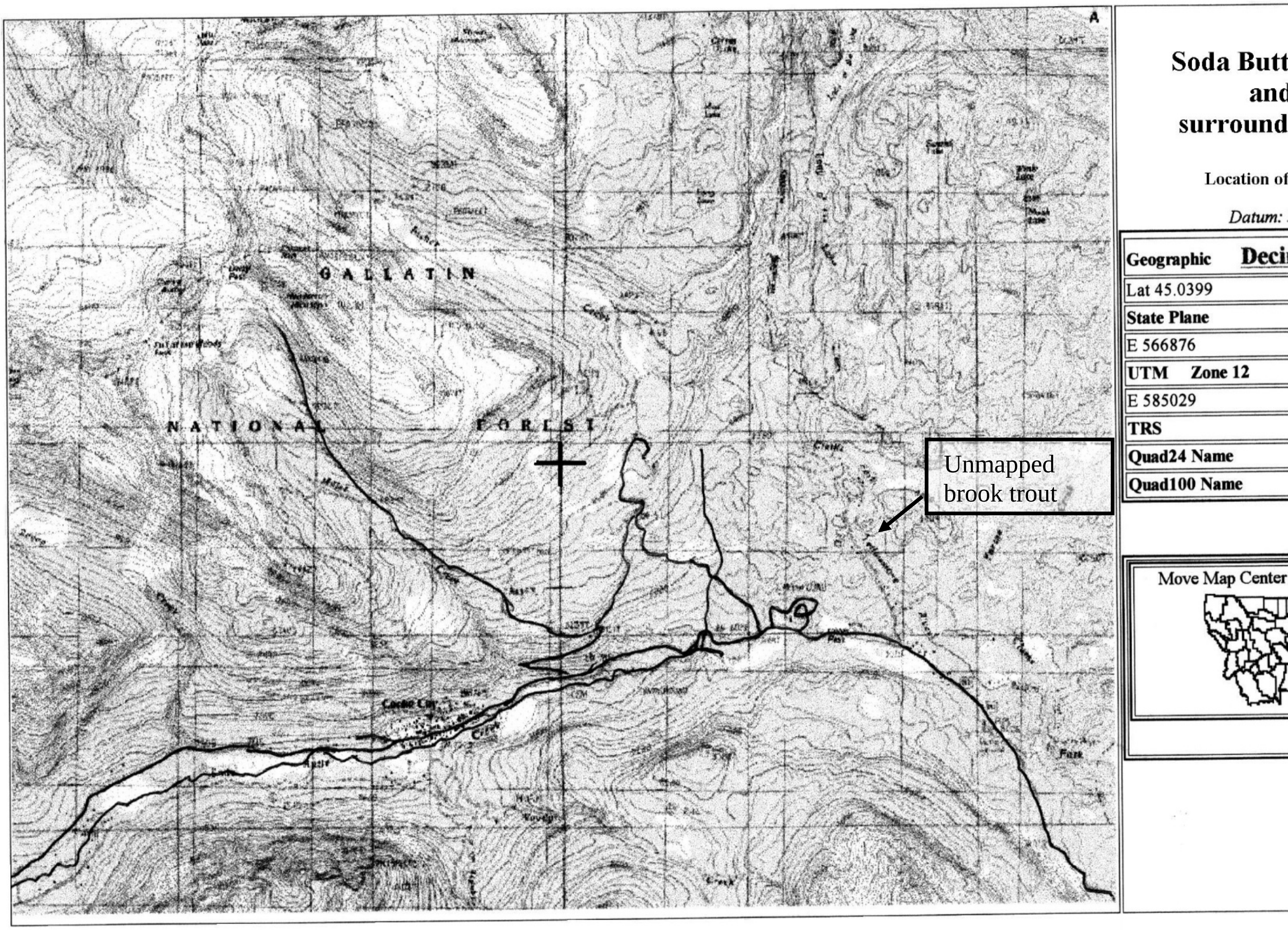


Figure 2. Cooke City area, Highway 212 and Soda Butte Creek.

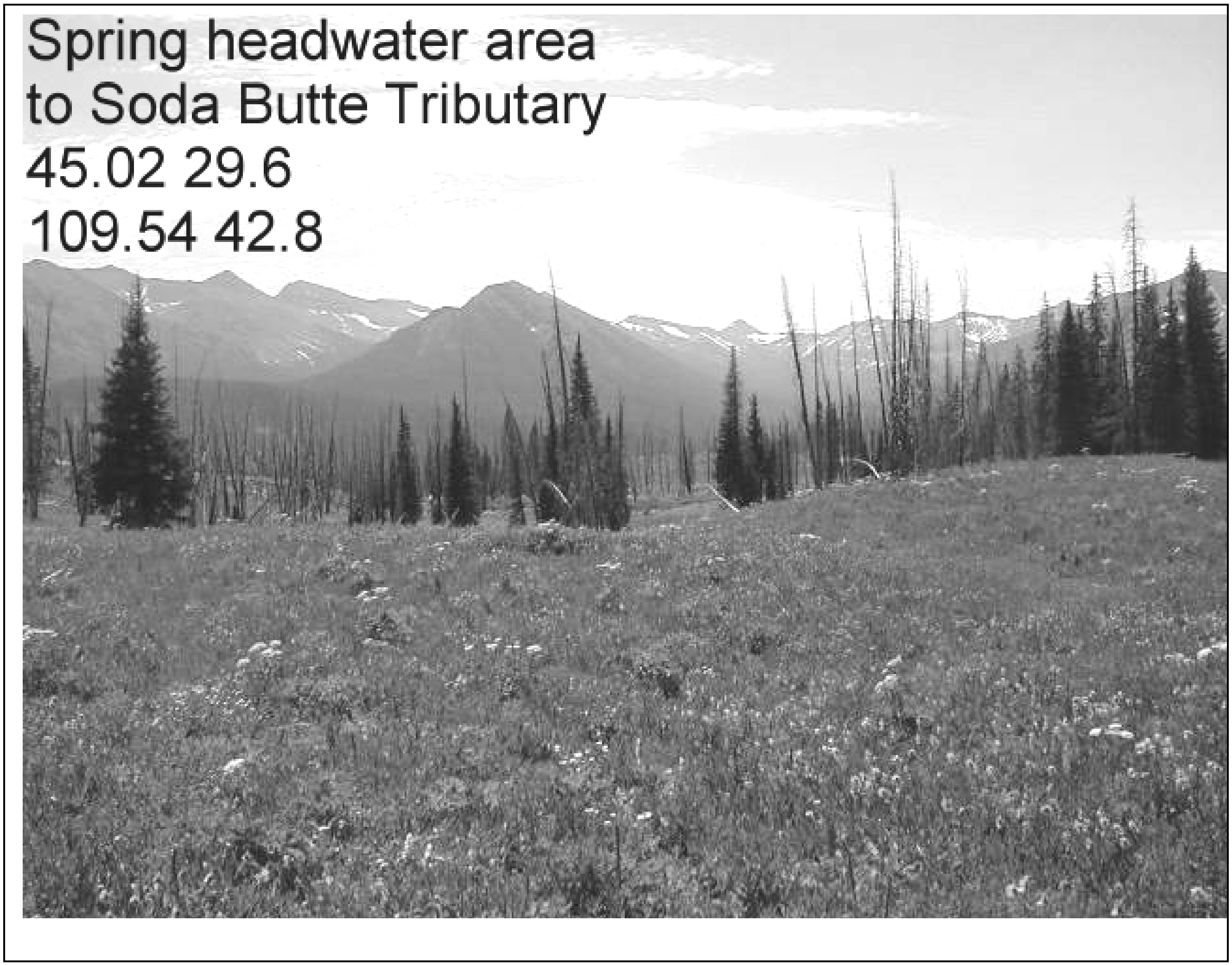


Figure 3. Headwater area of the tributary of Soda Butte Creek that is to be chemically rehabilitated.

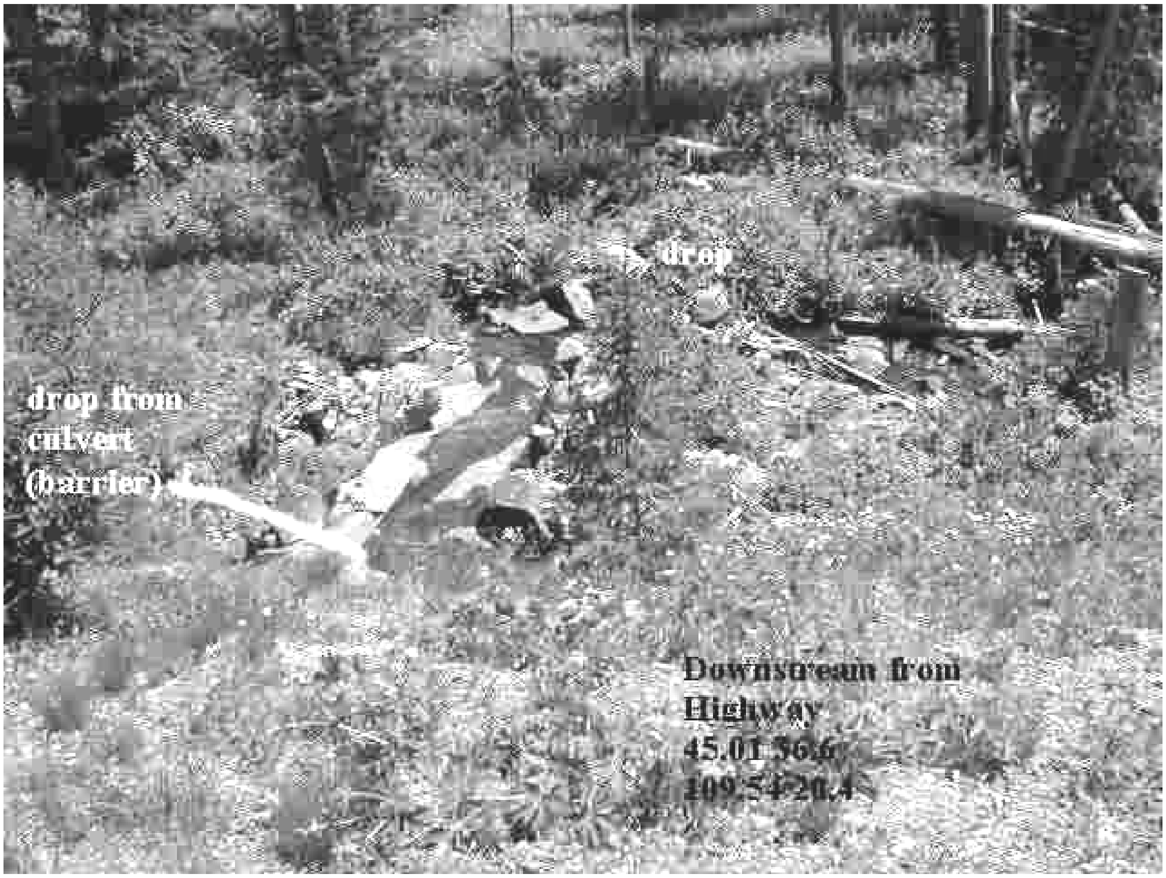


Figure 4. View from Highway 212 looking downstream on unnamed tributary to Soda Butte Creek.

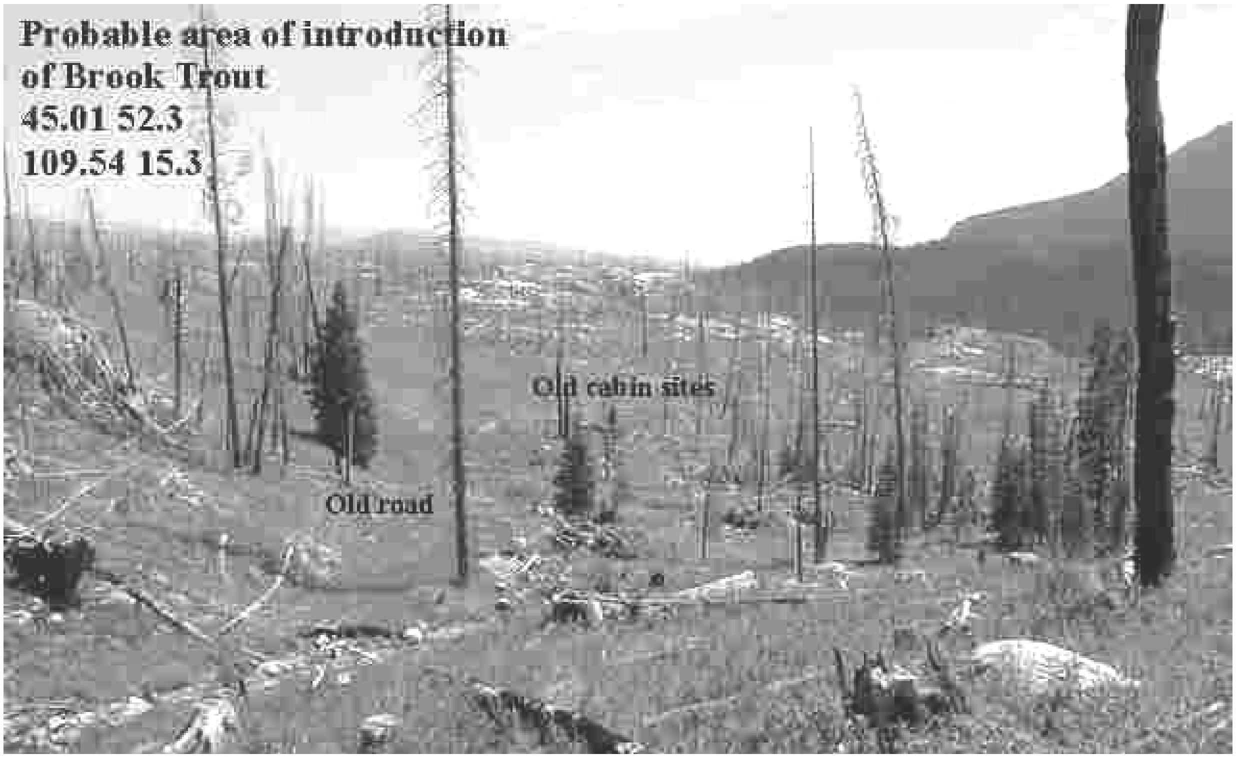


Figure 5. Probable site of brook trout introduction on the NE tributary of Soda Butte Creek.

A second attempt was made to mechanically remove brook trout from the confluence of Woody Creek upstream to the headwaters of the unnamed tributary beyond the Highway 212 culvert. Removal efforts proved very difficult in the unnamed tributary. The fires of 1988 burned across most of the watershed of the unnamed tributary and many of the trees have since fallen into the stream (Figure 6). This debris has created excellent habitat for brook trout in the form of pools under dense woody cover. It was determined that complete removal of brook trout from the upper reaches of the unnamed tributary using electrofishing would be very difficult and likely impossible due to the complexity of the habitat. In other areas of Montana with similar stream habitat, repeated removal efforts have also been unsuccessful at achieving 100% removal of nonnative fishes (i.e., Muskrat Creek and Bad Canyon Creek). Without complete removal of brook trout, the YCT population downstream would continue to be at risk of displacement by brook trout. For these reasons a plan was developed that included both electrofishing and chemical removal of brook trout.

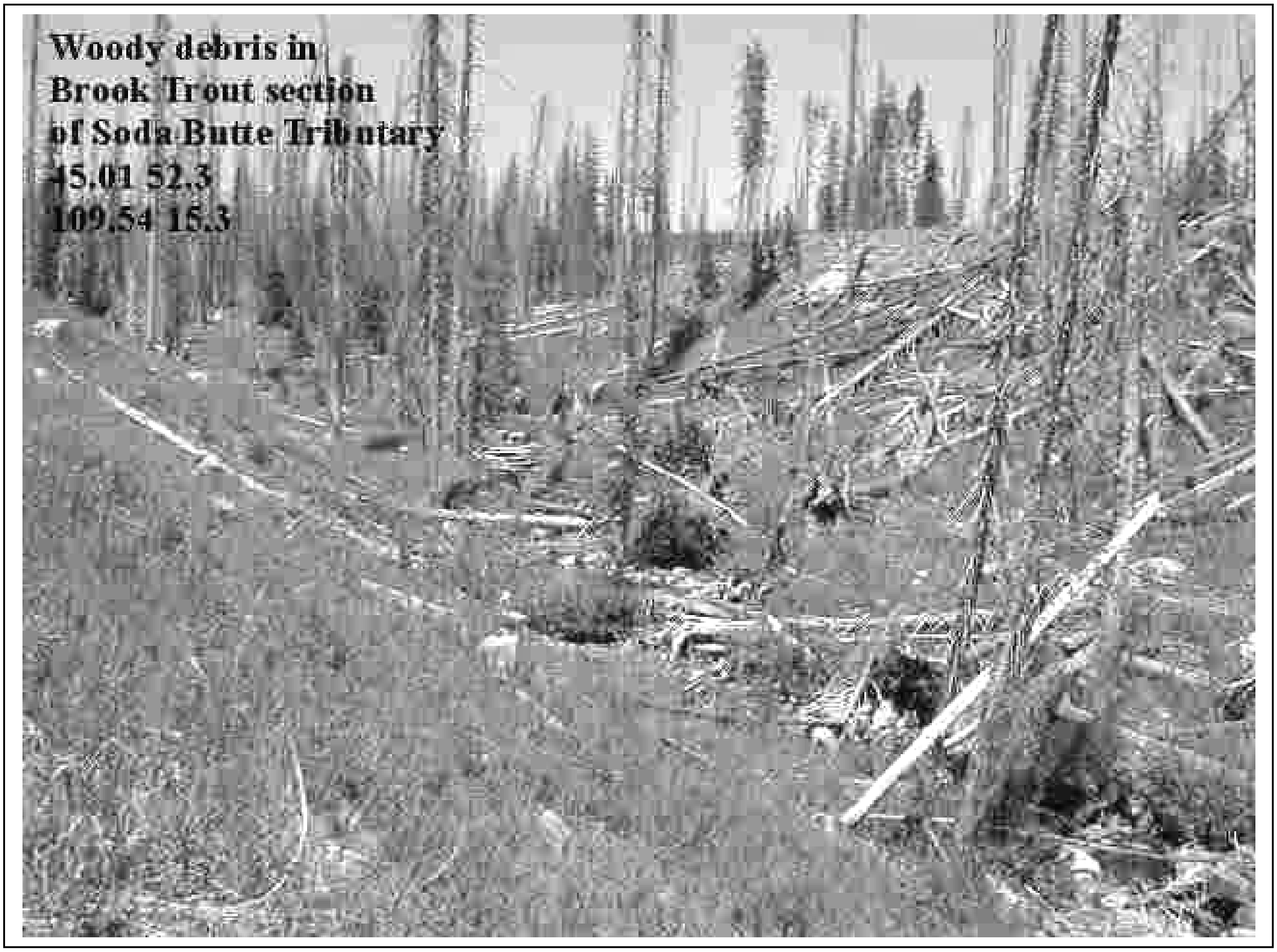


Figure 6. Dense woody debris overlying an unnamed tributary to Soda Butte Creek.

The McClaren Tailings pile has in the past slowed the migration of brook trout from the upper reaches of Soda Butte Creek by forming a chemically toxic barrier. The tailings pit is being reclaimed, however, and the water quality in Soda Butte Creek will likely improve allowing the brook trout population in the creek to expand. Brook trout population expansion could have substantial negative effects on cutthroat trout in Soda Butte Creek and other streams in the upper Lamar River system. Therefore, FWP is proposing to remove brook trout from the Soda Butte Creek drainage using a combination of methods. This proposal has been developed and will be implemented in cooperation with the Gallatin National Forest, Yellowstone National Park, and Montana State University.

There are two basic components of brook trout removal from upper Soda Butte Creek: chemical removal of brook trout from the unnamed tributary to Soda Butte Creek, and mechanical removal of fish downstream of the Highway 212 culvert and into Yellowstone National Park.

A. Chemical Removal

Due to the habitat complexity and the abundance of brook trout in the unnamed tributary to Soda Butte Creek, the most effective way to remove the entire brook trout population will be through the use of a piscicide. The proposed toxicant is antimycin, an ant-fungal chemical that, when applied at very low concentrations, is extremely toxic to fish. It affects fish by interrupting cellular respiration and hampering their ability to use oxygen. Antimycin is preferred for this projects over other chemicals because (1) it is applied at very low concentrations, (2) it rapidly breaks down in the environment and (3) fish cannot detect its presence in the water and therefore do not try to avoid the chemical.

For removal of fish in streams, antimycin is normally applied at a concentration of 4-10 parts per billion (ppb) i.e., 4-10 parts antimycin to every billion parts of water. An antimycin concentration of 10 ppb is about 1,750 times lower than the level determined by the Department of Environmental Quality (DEQ) to be safe for long-term human consumption, and 175,000 times lower than the safe level for short-term consumption (DEQ 1999). Also, because of its low application rate, there are few effects on non-target aquatic and terrestrial organisms. Gilled aquatic species are susceptible to low concentrations because it quickly enters their body through the gills. Organisms without gills are exposed in such ways that low concentrations used to kill fish do not affect them. Slight reductions in invertebrate populations have been noted following chemical treatment with antimycin, but populations have been shown to rebound quickly following treatments. Amphibian tadpoles are also affected by antimycin, but adults are resistant to the chemical at fish killing concentrations. Treating waters during the fall when tadpoles are not present can mitigate potential impacts to amphibian populations. Further, most amphibians in the Absaroka-Beartooth Mountains are associated with standing water bodies, rather than streams.

There is no risk of antimycin to birds, mammals or other terrestrial animals at fish-killing concentrations. Bioassays on mammals indicate that the proposed concentration of antimycin will have no effect on mammals, including humans, that drink the treated water (Schnick 1974). Greselin and Herr (1974) simulated conditions that might occur during an actual fish poisoning project. Dogs were exposed for 12 weeks to water treated once with antimycin at a concentration of 125 ug/L (roughly 12 times the concentration to be used in this project). They found that body weight gain was actually higher in dogs consuming the treated water versus control water, and that the treated animals showed no signs of physiological or biochemical changes during the treatments. The product label for the commercial form of antimycin (Fintrol) states, however, that treated water should not be used for drinking by humans or animals or for crop irrigation, until fingerling fish can survive a 48 hour exposure. Posted signs at road/stream crossing during the treatment will warn the public that they and their pets should not consume creek water. Once fish (rainbow trout or bluegills) have been shown to survive for 48 hours, the signs will be removed. It is anticipated that the chemical treatment phase of this project will last between 2 and 4 days. There should be no risk to campers at the Soda Butte Campground because it is below the chemical treatment area. As a precaution, however, the campground will be temporarily closed to the public during the treatment.

Antimycin naturally degrades very quickly in the water; therefore, the risk of the chemical persisting in the stream is minimal (Tiffan and Bergersen 1996). The risk that antimycin will enter and be mobile in groundwater is minimal because it has a strong tendency to adsorb to sediment particles and has a low solubility in water (Schnick 1974). Once bound to organic molecules, antimycin becomes inert and breaks down quickly without detoxification. In other studies, including those in the Absaroka-Beartooth Mountains, antimycin persisted in stream waters for less than 1 hour before naturally breaking down. This degradation is so fast that fish can be replanted in a stream treated with antimycin after 48 hours. There will be no persistent or long-term effects of this chemical on the existing or anticipated uses of the water.

Unlike other piscicides such as rotenone, fish cannot detect the presence of antimycin in the water and do no try to avoid the chemical. With rotenone, fish have been shown to migrate to spring areas or out of the treatment area to find areas of fresh water and thus survive chemical treatment. Further, it would be undesirable for fish to migrate from the unnamed tributary into Soda Butte Creek where they would have to be mechanically removed. For this project, therefore, antimycin is preferred over rotenone.

Antimycin is applied to the stream using constant-head drip stations spaced at specified intervals along the stream (Figure 7). Antimycin will be administered to the stream for an 8-hour period to ensure that all fish are adequately exposed to the chemical. Two treatments will be performed in the stream 1-2 days apart to ensure that a 100% fish kill is achieved. The concentration of antimycin to be used in the unnamed tributary will be determined through a bioassay, a series of tests performed in the target stream where fish are incubated in water with a known concentration. The minimum concentration of antimycin that is effective at killing fish is selected as the concentration to use to treat the entire stream. That concentration will likely be between 4 and 10 ppb.

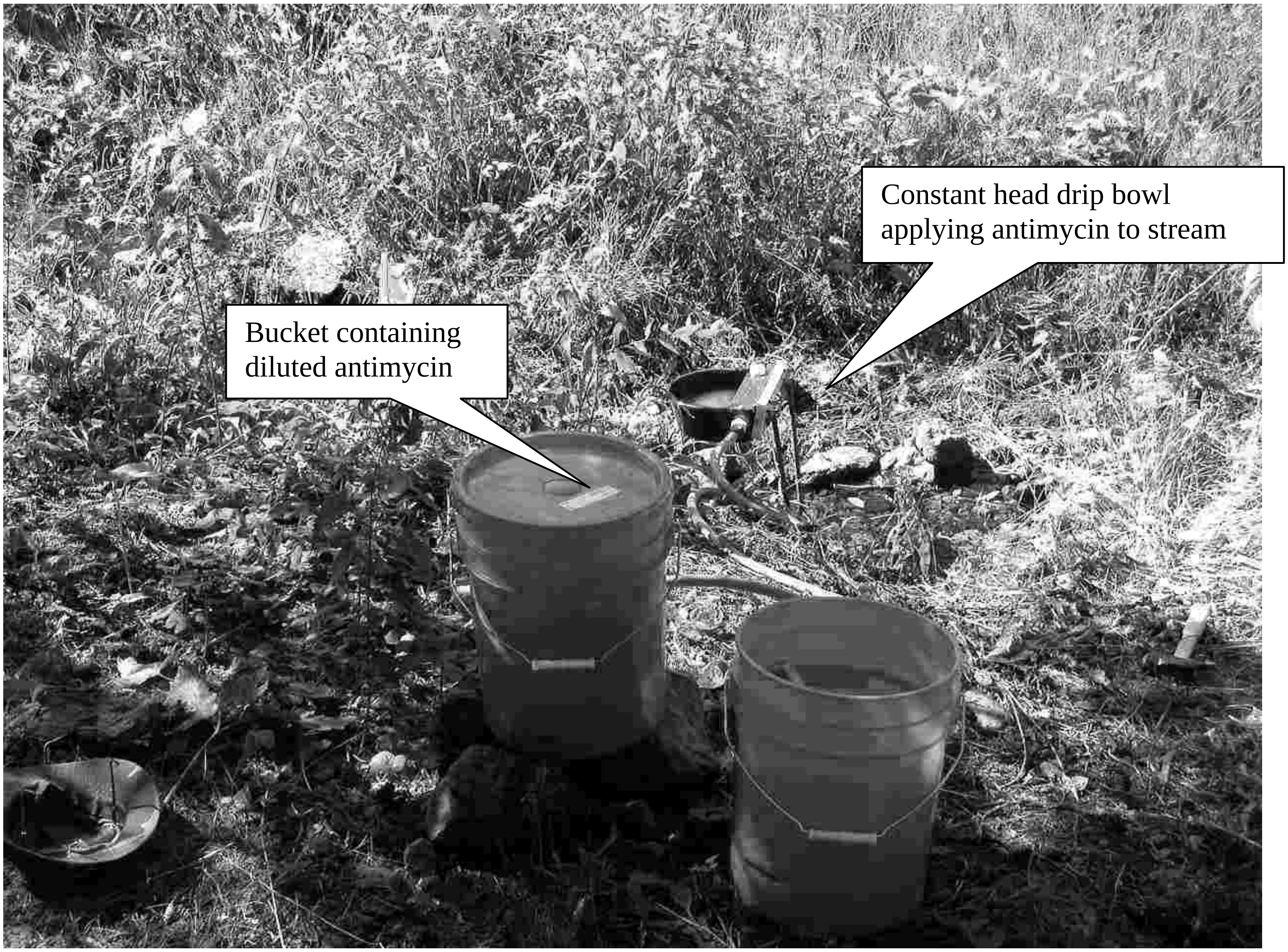
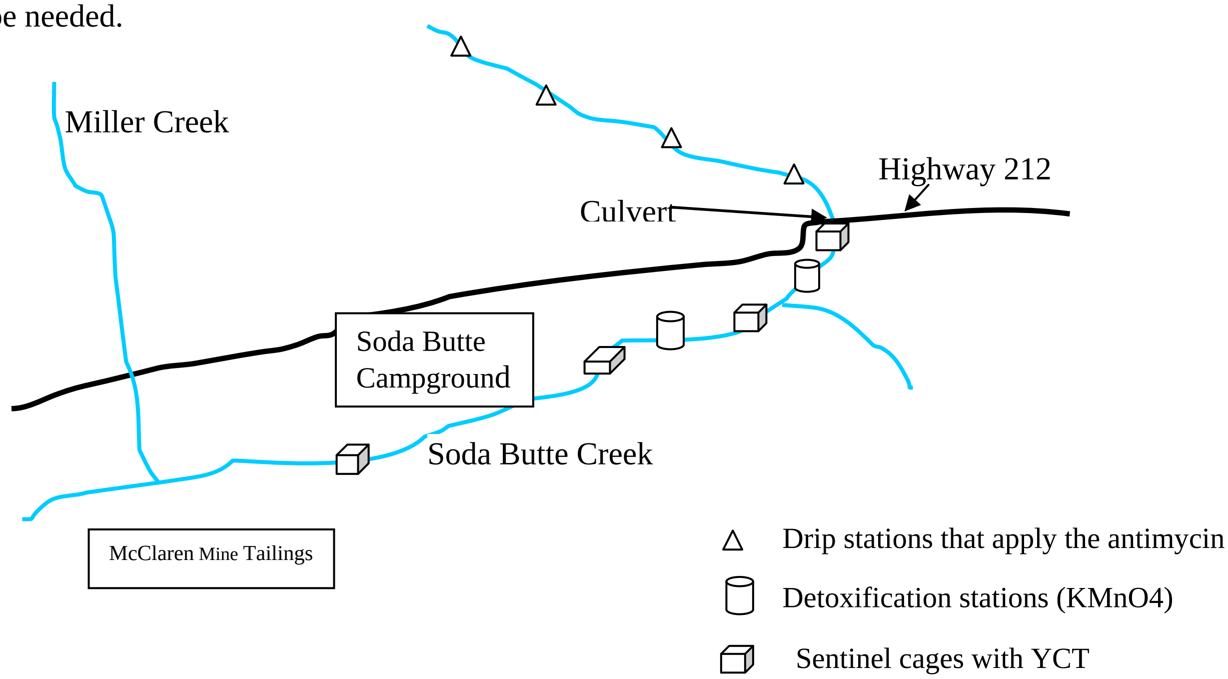


Figure 7. Drip station where diluted antimycin is administered to the stream. System was adjusted so that the bucket would completely drain in 4 hours. Shown system used at Smith Coulee in the Custer National Forest.

The end of the chemical treatment area will be the Highway 212 culvert. The antimycin will be stopped at this point using a detoxification station. Antimycin can be quickly neutralized using potassium permanganate ($KMnO_4$). $KMnO_4$ is a strong oxidizer that is commonly used in drinking water supplies to oxidize metals, kill bacteria and viruses, and remove unpleasant tastes. $KMnO_4$ will be used at a concentration of approximately 2-4 ppm (parts per million), with the exact concentration to be determined during the bioassay. Treated waters will be allowed to go beyond the treatment area without first being detoxified. The effectiveness of the detoxification will be monitored using sentinel fish. YCT from the Big Timber Hatchery will be placed immediately upstream and downstream of the $KMnO_4$ station (YCT will be used instead of the label recommended rainbow trout because of the potential of introducing this nonnative into Soda Butte creek; YCT and rainbow trout have similar susceptibility to antimycin). The survival of fish immediately upstream of the $KMnO_4$ station will indicate when and for how long detoxification is needed. The flow of $KMnO_4$ into the stream will begin as soon as the closest antimycin drip station has begun. As the sentinel fish upstream of the detoxification die, they will be periodically replaced to monitor for the presence of antimycin in the water. When fish above the detoxification station survive for 48 hours, $KMnO_4$ will no longer be needed because insignificant amounts of antimycin are present in the water. The sentinel fish downstream of the detoxification station will indicate how effective the $KMnO_4$ is at neutralizing the antimycin. If fish below the detoxification station show signs of antimycin poisoning (i.e., loss of equilibrium or death) the concentration of $KMnO_4$ will be increased, and a second backup detoxification station will be started further downstream. (See Drawing 1 for conceptual layout of treatment area.) It is anticipated that only the primary detoxification station will be required to fully neutralize the antimycin, but the backup will be ready should it be needed.



Drawing 1. Conceptual layout showing the location of drip stations for administering antimycin to the stream, sentinel cages for monitoring antimycin presence in water, and detoxification stations.

1. Chemical removal would begin the week of September 6th, after Labor Day and before the brook trout spawn. If brook trout spawn prior to project completion, the eggs in the stream gravels would be much less susceptible to both chemical and mechanical removal. The creek will be treated twice in one week, with the first treatment immediately following the second. All fish killed by the poison will be collected and disposed of off site to prevent attracting bears and other wildlife to the project area. A two-or three-person crew will perform the chemical removal phase of the project. The applicators of the antimycin will be certified in the application of piscicide to waters of Montana.

B. Mechanical Removal

The second phase of the project would involve mechanical removal of brook trout from the Highway 212 culvert downstream into Yellowstone National Park. The current extent of brook trout invasion into

Yellowstone National Park is unknown. Therefore, electrofishing crews would determine the extent of invasion and then focus upon removal in areas where brook trout are present. Three or 4 person crews from the USFS, the NPS, and Montana State University would perform the electrofishing. All crews would have at least one person who is certified in electrofishing techniques and safety. Four to six crews will work simultaneously on different reaches of stream. All brook trout captured would be euthanized and disposed of off site. Previous removal efforts indicate the brook trout population below the Highway 212 culvert is small. In 1994, 13 brook trout were removed between the Soda Butte Campground and Woody Creek; in 1995, 7 fish were removed; and 2 were removed in 1996 from the same reach. Electrofishing efforts will be extended up Miller, Woody and Sheep creeks until no fish, brook or cutthroat trout, are encountered. Cutthroats captured would be measured, counted and placed in live car nets in the stream. These fish will remain in the nets until removal efforts are completed to avoid multiple shockings during subsequent electrofishing passes.

The efficacy of both the chemical and electrofishing removal of brook trout will be evaluated during the fall of 2004 and summer of 2005. The reaches above and below Highway 212 will be electrofished and evaluated for the presence of brook trout. If brook trout are present, the chemical and mechanical treatments will be repeated during the early fall of 2005. If no brook trout are present, the unnamed tributary upstream above Highway 212 will be stocked with YCT from the Big Timber Hatchery and the project will be considered complete. These fish are YCT from McBride Lake in the Slough Creek drainage and should be well suited for the area. Periodic monitoring in Soda Butte Creek would continue to check for the presence of brook trout and to monitor the response of YCT to brook trout removal and the tailing pit cleanup.

C. Summary of Project

In summary, there are 3-4 phases proposed to continue the effort to protect the YCT population in Soda Butte Creek.

Phase 1 would begin during the week of September 6, 2004, when non-native trout will be removed using antimycin in the unnamed tributary to Soda Butte Creek upstream of Highway 212. Two chemical treatments will be conducted in the upper tributary, approximately 1-2 days apart. The goal of this phase is a complete elimination of brook trout in the treated reach

Phase 2 would occur at the same time as phase 1 and will involve mechanically removing brook trout from Soda Butte Creek and its tributaries downstream from Highway 212.

Phase 3 would be an introduction of YCT through the use of egg boxes or by direct planting using hatchery stocks in the creek upstream of Highway 212, once brook trout elimination is accomplished. The stream would be stocked in the fall of 2004 or spring/summer of 2005. The goal of this phase is to increase the numbers and the range of YCT.

Phase 4, if necessary, would be a repeat of Phase 1 and Phase 2 in 2005, should efforts not remove 100% of the brook trout.

2. <u>Purpose and Need for the Proposed Action</u>:

a. Range-wide YCT status: The distribution and abundance of Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*; YCT) have declined from historical levels over part or all of their range. YCT historically occupied about 17,397 miles of habitat in the western U.S. (May etal. 2003). YCT currently occupy an estimated 7,528 miles of historical habitats (43%). Pure YCT with no evidence of genetic introgression (i.e., cross breeding with rainbow or golden trout) currently occupy about 1,300 stream miles (17%) of habitat, but this may be a low estimate because of sampling bias. Refined estimates suggest that approximately 3,000 miles (17%) of occupied habitat likely contain genetically unaltered YCT based on no record of stocking or by having no hybridizing species present. Much of the habitat currently occupied by YCT was located in designated parks (2%), wilderness areas (19%), and other roadless areas (40%), and almost 70% of habitats currently occupied lie within federally managed lands.

b. State-wide status: Historically in Montana, YCT were the only trout known to occupy aquatic habitats within the upper Yellowstone River. At the time of the Lewis and Clark Expedition, this subspecies of cutthroat trout was prevalent in the mainstem Yellowstone River and in numerous tributary drainages. Some tributaries to the Bighorn River contained YCT, but the mainstem in Montana did not. Approximately 4,300 stream miles were occupied by YCT, consisting of hundreds of interconnected and isolated populations within this state. The most recent assessment of YCT distribution within the state found 40 pure stream dwelling populations (FWP 2000). Historically fewer than 10 lakes supported YCT, but because of stocking programs in the high mountain lakes, there are currently more that 175 lakes that support YCT populations. The reasons for the dramatic decline of native stream-dwelling populations has been linked to the influences of nonnative trout, habitat alteration, and to a lesser extent, over-exploitation (FWP 2000).

In August of 1998, the US Fish and Wildlife Service (USFWS) was petitioned to list the YCT as threatened under the Endangered Species Act (ESA). The recovery efforts currently being conducted in Montana contributed to rejection of this petition. Listing of the YCT would have resulted in a loss of local management options. On January 13, 2004, conservation groups initiated another lawsuit against the USFWS for illegally denying listing of the YCT. The outcome of this suit is still pending.

Native YCT are a part of Montana's heritage, and are a symbol for one of the nation's most famous parks. Catching a native trout is still one of the values that Montana has to offer its residents and visitors. Due to their current status In Montana, "catch-and-release" regulations apply for most streams where they are present. The 2000 <u>Cooperative Conservation Agreement for Yellowstone Cutthroat Trout within Montana</u> states as its goal to: "Ensure the 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." The proposed action would fulfill the management and conservation objectives presented in this agreement.

c. The Yellowstone River Basin: Many of the identified riverine populations of YCT in Montana are found within or near the boundaries of the Custer and Gallatin National Forests. According to Montana fish-stocking records, 31 of the 38 streams/watersheds identified with YCT, have been stocked with one of the following species: rainbow trout, brook trout, brown trout, YCT or other unidentified trout

(Gallatin/Custer National Forests et al 1998). Many of the YCT populations in this area are isolated remnants of original populations that have survived above barriers to fish migration.

Due to introductions of YCT to lakes of the Absaroka-Beartooth Mountains, the status of lake populations is less bleak. Montana high mountain lake records indicate there are 63 lakes with reproducing populations and an additional 74 stocked populations of YCT. Less than five of these lakes originally supported fisheries. These introduced fish are from either wild stock (live fish transfer), the Yellowstone River stock of cutthroat trout, or from McBride Lake stock (in Yellowstone Park) reared in hatcheries. These lake populations are important to the survival of YCT as a species, but are not indigenous populations.

3. <u>Benefits of the Project:</u>

This project would establish a resident YCT population in a stream that is currently unoccupied by YCT (unnamed tributary north of Highway 212), and it would remove the threat of predation and competition from non-native brook trout in Soda Butte Creek and the Slough Creek drainage. It will also aid in preventing the downstream migration of brook trout into Yellowstone National Park. In turn, this project will help achieve the goals and objectives listed in the Cooperative Conservation Agreement for Yellowstone Cutthroat Trout within Montana for the restoration of YCT both statewide and locally. The social benefit of this effort will be the preservation of this unique and rare fish species and population and the ability of future generations of people to enjoy this native fish species in its natural habitat. It would also prevent the need for more restrictive management, maintain public use for angling, and reduce the potential for listing under the Endangered Species Act.

G. Other Local, State or Federal agencies with overlapping jurisdiction.

USFS **–** The Gallatin National Forest manages nearly all of the land on which the project is to take place. In Challenge Cost Share Agreement 11-98-CCS-27 between federal agencies and the Montana Fish, Wildlife and Parks responsibilities were acknowledged as follows: “The FS (Forest Service) and BLM (Bureau of Land Management) are responsible for management of aquatic habitats and for coordination of land uses consistent with laws, rules and regulations.” “FWP (Montana Fish, Wildlife and Parks) has primary responsibility for management of fish and wildlife resources within the State of Montana, including all State, Federal and Private lands.” The Conservation Agreement and Management Guidance for Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*) and Yellowstone cutthroat Trout (*O. c. bouvieri*) within Gallatin National Forest Administered Lands, between the Gallatin National Forest and the Montana Fish, Wildlife and Parks states that “The Montana Department of Fish, Wildlife and Parks (MDFWP shall: …Take appropriate actions to remove non-native trout that have potential to contaminate and/or compete with native cutthroat populations.”

NPS **–** The NPS manages the fisheries and wildlife within Yellowstone National Park.

Wyoming Game and Fish Department - Although the project does not extend into Wyoming, many of the tributaries draining from the south originate in Wyoming, and Soda Butte Creek flows into Wyoming inside Yellowstone National Park.

Montana Department of Environmental Quality - DEQ requires that, prior to the administration of any piscicide into waters of Montana, the project is reviewed and a 308 permit is issued.

Montana Department of Agriculture - MDDofA is responsible for regulating the use of restricted use pesticides within the state of Montana.

H. Agencies Consulted During the Preparation of the EA

National Park Service, Yellowstone National Park: Todd Koehl, Dan Mahoney
USDA Forest Service, Gallatin National Forest, Livingston/Gardner, MT: Ken Britton, Scot Shuler.
Fish, Wildlife & Parks Region 5. Regional Fisheries Manager. Billings, MT: Jim Darling,.
Fish Wildlife & Parks. Helena, MT: Don Skaar.
Department of Environmental Quality. Helena, MT: John Wadhams

PART II. REVIEW OF ALTERNATIVES

Alternative 1 - No Action.

The predicted consequence of the "No Action" alternative is a high probability that the YCT population in Soda Butte Creek will become severely reduced or eliminated due to competition and predation from the non-native brook trout, particularly as the McClaren Pit is reclaimed. Brook trout will likely migrate downstream into other waters within Yellowstone National Park and affect YCT populations there as well.

Alternative 2– The proposed Action as described above

Alternative 3– Mechanical Removal of Entire Reach Occupied by Brook Trout

This alternative is the same as the Proposed Action except that no fish toxicants would be used. Removal of fish would be by mechanical means only, including both electrofishing and potentially angling. Angling is the least effective of these methods, and it is estimated that only 20% of fish can be removed this way on an annual basis. Successful spawning by brook trout from year-to-year will nullify much of this effect. Angling is also a particularly inefficient method for removing small fish. Electrofishing is much more efficient at removing fish than angling, but also has limitations in certain situations. Electrofishing is inefficient at removing small fish, and total effectiveness in the unnamed tributary north of Highway 212 has been very low because of the dense woody debris in the stream. Fish can sense the electricity when electrofishing and they tend to hide under the cover of rocks or in woody debris to avoid capture. When habitat complexity is low, electrofishing can draw the fish out from these hiding areas; but when complexity is high, either fish cannot be reached by the electrical current or stunned fish cannot be seen or removed from the cover.

The goal of this project is 100% removal of the brook trout population from the Soda Butte Creek drainage. The mechanical removal alternative is considered to be economically and technologically infeasible because of the inability to successfully remove the entire brook trout population from the creek. Mechanical removal would reduce the population size of brook trout, which would likely aid YCT in the creek, but mechanical removals would have to be repeated frequently to maintain the low numbers of brook trout. Further, without 100% removal, the risk of brook trout moving further downstream would continue into the future.

The predicted consequences of Alternative 2 include:

- Marginal or slow increase in the abundance of YCT in Soda Butte Creek.
- Further downstream expansion of the brook trout population into Yellowstone National Park.
- Outlay of substantial funds and staffing on an annual/biannual basis for an unknown number of years to mechanically remove brook trout.

Alternative 4 – Rotenone Instead of Antimycin as the Piscicide

Rotenone is another piscicide that has been widely used in fisheries management. Rotenone is a derivative of tropical plants and kills fish in the same manner as antimycin. Rotenone is applied at higher concentrations (i.e., 1-2ppm) than antimycin (4-12 ppb) and can be detected by fish. Because fish can detect the chemical, they try to avoid it and seek spring seeps or other areas of refuge. The effectiveness of treatment can be impeded with the use of rotenone when there are refugia available for fish. Rotenone also readily breaks down in the environment, the rate of which depends on several factors including temperature, exposure to sunlight, alkalinity, pH, and other factors, but the rate is not as fast as antimycin. Thus, more stream can be treated between application points and fewer drip stations would be needed, but because rotenone does persist longer, there is an increased risk of the chemical traveling beyond the treatment area. Rotenone can also be rapidly detoxified using potassium permanganate ($KMnO_4$). Rotenone is less expensive than antimycin--a gallon of rotenone is approximately $55 and a unit of antimycin (approximately 1 pt) is $350. Because of the proximity of the Soda Butte Campground and Cooke City, the piscicide antimycin was selected as the preferred option for treating the stream because of its fast breakdown rate and the low concentrations needed. However, physical and chemical conditions in Soda Butte Creek may adversely affect the breakdown rate of antimycin, as has been seen on other projects (Olsen 2004), and antimycin may not be effective at producing a 100% fish kill. Bioassays conducted during the summer of 2004 would indicate whether antimycin would be effective at producing a complete fish kill. If antimycin is not effective due to excessive photolysis or otherwise rapid neutralization, rotenone would become the preferred chemical to perform the chemical treatment. Therefore, even though it is not the preferred alternative, sections hereafter would reference rotenone relative to its effects on fish and other aquatic and terrestrial ecosystems because it may be used if antimycin proves ineffective.

Alternative 5. Extend Chemical Treatment Area to Miller Creek.

An option that was considered but rejected included chemically treating the unnamed tributary and Soda Creek downstream of the Highway 212 crossing to the confluence of Miller Creek. Under this alternative the $KMnO_4$ detoxification station would be located upstream of the confluence with Miller Creek. Miller Creek is a major tributary to upper Soda Butte Creek (they are roughly equal in size) and the antimycin would be neutralized upstream of the confluence. Because of its size, Miller Creek would dilute the antimycin, which would reduce the risk of fish-killing concentrations extending beyond the project reach. Soda Butte Campground would be closed to ensure that people do not come in contact with or attempt to drink the treated waters. Although antimycin poses little threat to humans or other animals at fish-killing concentrations, the product label requires that treated waters not be used for consumption. The advantages to this option are that the less reliable mechanical removal would not be needed above the confluence of Miller Creek. Thus, a 100% removal of brook trout would be ensured to this point. The disadvantage is greater risk that the chemical could approach Cooke City if not fully detoxified, and the chemical treatment would kill the YCT in Soda Butte Creek to the confluence of Miller Creek. Because of these disadvantages, Alternative 5 was less favorable than the preferred alternative.

PART III. ENVIRONMENTAL REVIEW

Below is an environmental review checklist followed by an explanation of potential impacts and the mitigating measures that will be taken to ensure the impacts of this project will be minimized as much as possible.

A. PHYSICAL ENVIRONMENT

1. <u>LAND RESOURCES</u> **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Explanation Index**
a. Soil instability or changes in geologic substructure?		X				
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil, which would reduce productivity or fertility?		X				
c. Destruction, covering or modification of any unique geologic or physical features?		X				
d. Changes in siltation, deposition or erosion patterns that may modify the channel of a river or stream or the bed or shore of a lake?		X				
e. Exposure of people or property to earthquakes, landslides, ground failure, or other natural hazard?		X				

2. <u>WATER</u> **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Explanation Index**
a. Discharge into surface water or any alteration of surface water quality including but not limited to temperature, dissolved oxygen or turbidity?			X		YES	2a
b. Changes in drainage patterns or the rate and amount of surface runoff?		X				
c. Alteration of the course or magnitude of flood water or other flows?		X				
d. Changes in the amount of surface water in any water body or creation of a new water body?		X				
e. Exposure of people or property to water related hazards such as flooding?		X				
f. Changes in the quality of groundwater?		X				2f
g. Changes in the quantity of groundwater?		X				
h. Increase in risk of contamination of surface or groundwater?			X		YES	see 2f
i. Effects on any existing water right or reservation?		X				
j. Effects on other water users as a result of any alteration in surface or groundwater quality?			X		YES	2j
k. Effects on other users as a result of any alteration in surface or groundwater quantity?		X				
l. Will the project affect a designated floodplain?			X		YES	2l
m. Will the project result in any discharge that will affect federal or state water quality regulations? (Also see 2a)			X		NO	see 2a

Comment 2a. Chemical treatment of the unnamed tributary north of Highway 212 will introduce the piscicide antimycin (or rotenone, should antimycin prove ineffective) into the waters of Soda Butte Creek. This will result in fish-killing concentrations of the chemical in the creek, which will represent a reduction in water quality.

Antimycin is an anti-fungal agent produced in cultures of the bacterium *Streptomyces* sp. Like rotenone it is toxic because it interferes with the use of oxygen at the cellular level. It is particularly toxic to fish and other aquatic organisms with gills because it can quickly move into the bloodstream and then to the tissues. The half-life of antimycin in the laboratory is about 5 days. Degradation will be much faster once applied to Soda Butte Creek due to exposure to sunlight, stream turbulence, and hydrolysis. Because of these factors, antimycin loses much of its toxicity over a drop in stream elevation of about 200 feet (Tiffan and Bergersen 1996), or every 30-60 minutes of flow time. This degradation is so quick that fish can be replanted in a stream treated with antimycin after 48 hours, and there will be no persistent or long-term effects of this chemical on the existing or anticipated uses of the water. An antimycin concentration of 10 ppb is about 1,750 times lower than the level determined by DEQ to be safe for long-term human consumption, and 175,000 times lower than the safe level for short-term consumption (DEQ 1999).

Both antimycin and rotenone will have only a minor potential impact on the water quality for several reasons. The concentration of toxicant in the target reach will be very low (4-10 ppb antimycin or 1 ppm rotenone), and will decrease downstream as the chemical degrades. Both concentrations are at levels far below those that are safe for human consumption. Both bind to organic molecules to become inert, and both break down quickly in the environment without detoxification. In addition, use of either chemical would be followed by detoxification with $KMnO_4$.

Both rotenone and antimycin are safe to use for chemical removal of unwanted species of fish, when handled appropriately. Both have been approved for use in fish removal, and both represent no threat to humans at proposed concentrations. Rotenone use is less expensive, although it requires higher concentrations, and is much bulkier to handle. Antimycin is effective at much lower concentrations, is more expensive, but is less bulky to handle. Antimycin breaks down into harmless components faster than rotenone, and fish cannot detect the presence of the chemical in the water and do not try to avoid treated waters. For these reasons, antimycin is the preferred toxicant for stream treatments.

To reduce the potential impact to water quality and non-target organisms, the following mitigation measures and monitoring efforts will be employed:

1. Only the minimum amount of piscicide to produce a 100% fish kill will be used during the project. A bioassay will be performed to determine the concentration of antimycin needed to produce a complete fish kill. It is anticipated that only a minimal amount of antimycin or rotenone will be needed to complete the project because of the small size of the stream. For example, to produce a concentration of 10 ppb of antimycin in a stream that flows 0.5 cfs (approximate flows of Soda Butte Creek in the project reach during September), approximately 163 ml would be administered to the stream over an 8-hour period. Assuming that drip stations would be located approximately 1/4 mile apart (8 drip stations over the approximately 2 miles of stream), a total of 2.6 liters of antimycin would be needed to treat the entire stream twice. For rotenone, less than 2 gallons would be necessary to treat the project reach.

2. A detoxification station will be set up downstream of the target reach. Potassium permanganate ($KMnO_4$) will be used at a concentration of 2-4 ppm to neutralize the fish toxicant at this point. This concentration should be more than adequate to reduce any remaining antimycin or rotenone at the project boundary. Experience from other projects indicates that detoxifying at a higher rate (4 ppm) more effectively neutralizes piscicides and has little impact on aquatic life. One person will continuously monitor the effectiveness of the detoxification station.

3. A secondary, backup detoxification station will be set up and made available should the first not completely detoxify the chemical.

4. Sentinel fish (Yellowstone cutthroat trout from Big Timber Hatchery) will be used to monitor for the presence of antimycin and rotenone in the water above and below the detoxification station. Trout are more sensitive to antimycin and rotenone than most other aquatic species, and they are used to monitor the presence of antimycin and rotenone by placing them in cages in the stream. The effectiveness of the detoxification station will be monitored using fish placed in the stream below the detoxification region. Sentinel fish would be placed in the stream upstream of the detoxification station and detoxification will begin as soon as the closes drip station is started. The detoxification will be ended only once the fish can survive in the stream upstream of the detoxification station for 48 hours.

5. Project personnel will be trained in the use of these chemicals including the actions necessary to deal with spills. Personnel will wear proper safety equipment.

6. A communication and safety plan will be developed in the case of an accident. Personnel will be equipped with radios so that communication can be maintained during the project implementation. A safety and spill plan will also be developed prior to project implementation. Safety equipment will be made available to all trained applicators and operators who will apply the antimycin.

7. No chemical, except what is necessary for a given day of treatment, will be stored near the stream.

8. The stream crossings on the Fisher Creek Road will be signed during the project to make travelers aware that the water from the stream is not to be consumed by persons or animals and to reduce the risk of exposure to the public.

9. The Soda Butte Creek Campground will be temporarily closed during the project to similarly reduce the risk of human exposure to treated waters.

These measures should reduce the risk of human and animal exposure to treated waters. Further, DEQ will review and permit this project before implementation to ensure that impacts to water quality are considered and minimized.

Soda Butte Creek suffers from mine-related pollution that has had substantial impacts on aquatic life in the creek. Given the low concentration of chemical to be used, the short duration of the project, and the rapid natural breakdown of the piscicides, water quality impacts should be minimal.

Although antimycin is the preferred chemical for treating Soda Butte Creek for reasons explained previously, it might be necessary to use rotenone if the conditions in Soda Butte Creek (i.e., temperature, pH, alkalinity, etc.) cause antimycin to be ineffective at killing brook trout. Rotenone is an insecticide commonly used in agriculture and home gardening. It is also a very effective fish toxicant that is relatively inexpensive and has been routinely used in stream rehabilitation. Similar to antimycin, rotenone acts by blocking the ability of cells use oxygen in the blood stream, causing fish to quickly asphyxiate.

Rotenone has a half-life of 14 hours at 24^{o}C and 84 hours at 0^{o}C, meaning that half of the rotenone is broken down and is no longer toxic within that time. As the temperature and sunlight increase, the rate that rotenone is broken down also increases. Higher alkalinity (>170 ppm) and pH (>9.0) also increase the rate of breakdown, but pH does not increase this breakdown as significantly as noted with antimycin. Rotenone tends to bind to and react with organic molecules rendering it ineffective, so higher concentrations are required in streams with increased organic debris. Without detoxifying, rotenone will be reduced to non-toxic levels in one to several days due to its natural breakdown and dilution in the aquatic environment.

In California, expected rotenone concentrations are approximately 0.025-0.050 ppm (25-50 ppb) when Nuysn-Noxfish is used at a concentration of 1.0-2.0 ppm (parts per million) (California Department of Fish and Game 1994). Limited data from the effects on animals indicates the safe concentration for short-term human consumption is about 350 mg/l (350 ppm). This is well over 100 times the application concentration. All concentrations are quickly broken down with an application of $KMnO_4$ at an approximately equal concentration.

There are not Federal or Montana water quality standards for antimycin or rotenone. However, these toxicants will have only a minor potential impact on the water quality for several reasons: The concentration of toxicant in the target reach will be very low (4-10 ppb antimycin or 1 ppm rotenone), and will decrease downstream as the chemical degrades. Concentrations will be at levels far below those that are safe for human consumption. Antimycin and rotenone both break down quickly in the environment without detoxification, and they actively bind to organic molecules and become inert. Increasing flows in Soda Butte Creek from tributary streams beyond the project reach will dilute concentrations below the project area.

Comment 2f: Even if groundwater contamination did occur, there would be no consequences for human health because the surface water concentrations to be used in this project have already been shown to have no toxic effect on humans or other mammals (see 2j). There are several reasons to believe that very little, if any, rotenone would reach any wells: 1) virtually all toxicant that reaches these points will have already been broken down by natural conditions or been oxidized by $KMnO_4$; 2) any toxicant that enters groundwater will be diluted by water already present in the aquifer, and 3) the chemicals are readily bound by organic debris and sediment and become inert. There is also little risk to the water supply that feeds Cooke City because the spring area where municipal water is collected is not part of the treatment area and is likely fed by a separate aquifer than the treatment area. (The water supply for Cooke City is on the south side of the Soda Butte Creek and the treatment area is north of the creek.) Groundwater wells supply drinking water to the Forest Service Soda Butte Campground below the project area. FWP will volunteer to monitor ground water quality in the wells if rotenone is used to remove brook trout. Pre- and post-treatment tests will be run to detect the presence of rotenone in the campground wells. Post treatment monitoring could extend to the following spring when the wells are once again activated for the summer. Groundwater testing will not be performed if antimycin is used, because no test exists that can detect the chemical at the low concentrations that are used to kill fish.

Comment 2j: Effects on other water users: Bioassays on mammals indicate that, at the proposed concentrations, antimycin and rotenone will have no effect on mammals, including humans, that drink the treated water (Schnick 1974).

3. AIR **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Explanation Index**
a. Emission of air pollutants or deterioration of ambient air quality? (also see 13 (c))		X				
b. Creation of objectionable odors?			X		No	
c. Alteration of air movement, moisture, or temperature patterns or any change in climate, either locally or regionally?		X				
d. Adverse effects on vegetation, including crops, due to increased emissions of pollutants?		X				
e. Will the project result in any discharge that will conflict with federal or state air quality regs?		X				

Comment 3b. If rotenone is used, the petroleum-based carriers (principally naphthalene) in the liquid formulation of rotenone, produce an objectionable odor. The petroleum odor should be confined to the project area and the immediate vicinity and should only persist until the project is completed. Antimycin does not produce an objectionable odor when applied to streams.

4. VEGETATION **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Explanation Index**
a. Changes in the diversity, productivity or abundance of plant species (including trees, shrubs, grass, crops, and aquatic plants)?		X				
b. Alteration of a plant community?		X				
c. Adverse effects on any unique, rare, threatened, or endangered species?		X				
d. Reduction in acreage or productivity of any agricultural land?		X				
e. Establishment or spread of noxious weeds?		X				
f. Will the project affect wetlands, or prime and unique farmland?		X				

5. <u>FISH/WILDLIFE</u> **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Explanation Index**
a. Deterioration of critical fish or wildlife habitat?		X				
b. Changes in the diversity or abundance of game animals or bird species?			X		NO	5b
c. Changes in the diversity or abundance of nongame species?			X		NO	5c
d. Introduction of new species into an area?			X		YES	
e. Creation of a barrier to the migration or movement of animals?		X				
f. Adverse effects on any unique, rare, threatened, or endangered species?		X				
g. Increase in conditions that stress wildlife populations or limit abundance (including harassment, legal or illegal harvest or other human activity)?		X				
h. Will the project be performed in any area in which T&E species are present, and will the project affect any T&E species or their habitat? (Also see 5f)		X				
i. Will the project introduce or export any species not presently or historically occurring in the receiving location? (Also see 5d)		X				

Comment 5b: The proposed action is expected to result in an increase in native YCT, and a decrease in non-native brook trout (both are considered game fish in Montana). The loss of brook trout from Soda Butte Creek is considered a minor impact because of the negative impact this species has on the native YCT. Further, many brook trout will remain in the nearby lakes and streams in the Clarks Fork of the Yellowstone River and other drainages. Brook trout in the treatment area provide only a minimally used fishery because of their small size, low density in the lower reach, and association with heavy cover in the upper reach. Further, YCT will still be present in Soda Butte Creek for anglers to catch. The project will increase YCT, a unique and potentially threatened environmental resource with limited distribution in the Yellowstone River basin. The increase in YCT associated with this project will help ensure the long-term persistence of YCT in Soda Butte Creek.

Comment 5c: Because there are no other fish species in Soda Butte Creek, the only non-game species that will potentially be affected are some taxa of invertebrates and potentially amphibians. The predicted effect is a temporary decrease in some invertebrate populations (Bramblett 1998; FWP 1999). Gilled invertebrates are susceptible to fish toxicants, but populations have been shown to rebound quickly following treatment. The reach to be treated with toxicants is relatively small, and adult forms of invertebrates can easily recolonize the treatment area from untreated areas downstream.

Adult amphibians (i.e., those that have lost their gills) are the most tolerant to rotenone and antimycin, while amphibian tadpoles are the more susceptible because they have gills at certain developmental stages. However, impacts to amphibian populations in Soda Butte Creek as a result of chemical treatment and mechanical removal of brook trout should be minimal because of the low density of amphibians in the stream, and many will have metamorphosed to the adult stage. There are no stream-obligate amphibians in south central Montana. The most common amphibian in the area is the spotted frog, which prefers littoral zones of lakes and slow, warm backwater areas of streams. Such areas are very limited in Soda Butte Creek because of its moderate gradient and confined channel, particularly within the chemical treatment area. Few to none amphibian tadpoles would be present in the stream late in the fall. Prior to chemical treatment, the treatment area will be surveyed for the presence of adult and juvenile amphibians, and all individuals found will be transported to an area outside of the project area.

There is no effect on birds or mammals that are exposed directly to rotenone or antimycin via drinking treated water, or eating fish killed by fish toxicants (Schnick 1974).

Comment 5d: There is no record of YCT being present upstream of the Highway 212 culvert crossing. Before the highway was constructed, however, YCT may have had access to this portion of the stream. After the chemical treatment phase of this project has successfully removed brook trout, YCT will be introduced into the stream upstream of the Highway 212 culvert. Because fish have been present upstream of the culvert for some time, it is likely that there will be no additional impact of YCT on other aquatic species.

6. NOISE/ELECTRICAL EFFECTS **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Explanation Index**
a. Increases in existing noise levels?		X				
b. Exposure of people to serve or nuisance noise levels?		X				
c. Creation of electrostatic or electromagnetic effects that could be detrimental to human health or property?		X				
d. Interference with radio or television reception and operation?		X				

B. HUMAN ENVIRONMENT

7. LAND USE **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Explanation Index**
a. Alteration of or interference with the productivity or profitability of the existing land use of an area?		X				
b. Conflicted with a designated natural area or area of unusual scientific or educational importance?		X				
c. Conflict with any existing land use whose presence would constrain or potentially prohibit the proposed action?		X				
d. Adverse effects on or relocation of residences?		X				

8. <u>RISK/HEALTH</u> <u>HAZARDS</u> **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Explanation Index**
a. Risk of an explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals, or radiation) in the event of an accident or other forms of disruption?			X		YES	8a
b. Affect an existing emergency response or emergency evacuation plan or create a need for a new plan?		X				
c. Creation of any human health hazard or potential hazard?			X		YES	see 8a
d. Will any chemical toxicants be used?			X		YES	see 8a

Comment 8a: Antimycin or rotenone will be used in phase 1 of this project. Both chemicals are restricted-use pesticides regulated by the Montana Department of Agriculture. Because the stream is small the treated reach will be short, and only a small amount of antimycin or rotenone will be needed to complete the project. The chance of a major spill will be minimal because only the necessary amount of toxicant will be kept on site. The concentration of antimycin to be used (10 ppb) is about 1,750 times lower than the level that is safe for long-term human consumption and 175,000 times lower than the concentration that is safe for short-term consumption (DEQ 1999). The DEQ risk analysis assumes that all intake of antimycin from a fish-poisoning project would be through the ingestion of water. Because antimycin does not bioaccumulate in fish to concentrations that exceed those in water, the daily intake of antimycin from fish is not included in their calculation of risk. Their evaluation of long-term risk also assumes no degradation or dilution of antimycin once it is in the creek, so this can be considered an extremely conservative estimate. Exposure of the public to this chemical will be reduced by closing the Soda Butte Creek Campground and posting all creek crossings upstream from Highway 212.

In California, expected rotenone concentrations are approximately 0.025-0.050 ppm (25-50 ppb) when Nuysn-Noxfish is used at a concentration of 1.0-2.0 ppm (parts per million) (California Department of Fish and Game 1994). The DEQ risk analysis indicates the safe concentration for short-term human consumption is about 350 mg/l (350 ppm), well over 100 times the application concentration. Neither antimycin or rotenone bioaccumulate in fish or other organisms (both compounds can be broken down naturally by the liver); therefore, there is little risk of the chemical persisting in other organisms and accumulating farther up the food chain.

The commercial formulation of antimycin (Fintrol) contains numerous other constituents including diethyl phthalate (used as a surfactant), acetone (used to extract the antimycin), and nonylphenol polyglycol ether (used as a detergent to put the antimycin into solution). None of these constituents will be present at levels that can be expected to have any effect on animal life. The nonylphenol polyglycol ether does contain some residual ethylene oxide (maximum of 5 mg/L), a potential carcinogen. Under the proposed treatment level in Soda Butte Creek, ethylene oxide would be introduced to the water at the extremely low rate of 62.5 pg/L (parts per quadrillion). This compound has a very low vapor pressure and is expected to volatilize immediately upon application.

The liquid formulations of rotenone that may be used in this project contain flammable petroleum-based emulsifiers in their formulation. The risks of fire and explosion will be minimized by the low volume of chemical to be maintained at the project area and through safe handling according to the product label. Before the chemical is administered to the stream, it will be diluted approximately 50 to 1 with water at the drip station, rendering the solution non-flammable.

The expected concentration of $KMnO_4$ needed to neutralize rotenone will be 4 mg/l (4ppm). The EPA believes the chronic toxicity of $KMnO_4$ breakdown products to be of no health concern because they are naturally occurring and common in surface waters. $KMnO_4$ is routinely used in drinking water treatment to oxidize iron and manganese and taste and odor compounds, as well as to control nuisance organisms such as bacteria and viruses (USEPA 1999).

9. COMMUNITY IMPACT **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Explanation Index**
a. Alteration of the location, distribution, density, or growth rate of the human population of an area?		X				
b. Alteration of the social structure of a community?		X				
c. Alteration of the level or distribution of employment or community or personal income?		X				
d. Changes in industrial or commercial activity?		X				
e. Increased traffic hazards or effects on existing transportation facilities or patterns of movement of people and goods?		X				

10. PUBLIC SERVICES/TAXES/UTILITIES **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Explanation Index**
a. Will the proposed action have an effect upon or result in a need for new or altered governmental services in any of the following areas: fire or police protection, schools, parks/recreational facilities, roads or other public maintenance, water supply, sewer or septic systems, solid waste disposal, health, or other governmental services? If any, specify: _______________			X		YES	
b. Will the proposed action have an effect upon the local or state tax base and revenues?		X				
c. Will the proposed action result in a need for new facilities or substantial alterations of any of the following utilities: electric power, natural gas, other fuel supply or distribution systems, or communications?		X				
d. Will the proposed action result in increased used of any energy source?		X				
e. Define projected revenue sources			X		YES	10e
f. Define projected maintenance costs		X				

Comment 10a: To reduce the probability of human exposure to treated waters, the Soda Butte Campground will be temporarily closed during the stream treatment. To mitigate the impacts to recreation, the treatment would occur after Labor Day. The campground generally closes in mid to late September, so the impact of closure during treatment should be minimal. Further, less than 1 mile away is Colter Campground, which recreationists can use as an alternative.

The water supply for Cooke City would not be affected by this project, as its water source originates in a spring away from the project area. It is not likely that groundwater in project area is connected to the Cooke City water source. Further, antimycin and rotenone are not known to travel through the groundwater because it binds to soil and other organic material and becomes inert. If rotenone is used, groundwater supplies that feed drinking water sources in the Soda Butte Campground will be monitored post-project.

Comment 10e: This proposed project would be accomplished cooperatively using personnel time contributed by the Gallatin National Forest, National Park Service, Montana State University and FWP.

Personnel			
Activity	**# people**	**# days**	**Person-days**
Electrofish	12	4	48
Treatment #1	4	2	8
Treatment #2	4	2	8
Replace YCT	3	1	3
Assessment	4	2	8
Total		10	75

Most of the necessary equipment was purchased for a separate project. The antimycin (or rotenone) and $KMnO_4$ must be purchased. Additional costs are outlined in the budget listed below.

Project Budget (excluding personnel time and previously procured equipment)			
Expense	Amount	Cost/unit	Cumulative Cost
Antimycin	4 units	$375	$1,500
$KmnO_4$	100 lbs	$9.20/lb	$ 920
DEQ 308 Permit	1	$300	$ 300
Safety equipment	3	$300	$ 900
Respirators w/face shields			
Groundwater tests	3	$60	$ 180
Other equipment			$ 300
		Total	$4,100

11. AESTHETICS/RECREATION Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Explanation Index
a. Alteration of any scenic vista or creation of an aesthetically offensive site or effect that is open to public view?		X				
b. Alteration of the aesthetic character of a community or neighborhood?		X				
c. Alteration of the quality or quantity of recreational/tourism opportunities and settings? (Attach Tourism Report)			X		No	
d. Will any designated or proposed wild or scenic rivers, trails or wilderness areas be impacted? (Also see 11a, 11c)		X				

Comment 11c: This project will provide the opportunity for individuals to catch native cutthroat trout in a fairly accessible area. It is located near several camping areas and Cooke City, MT. Although camping at the Soda Butte Campground may be temporarily affected (see comment 10a), this effect should not last more than 1 week.

12. CULTURAL/HISTORICAL RESOURCES Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Destruction or alteration of any site, structure or object of prehistoric historic, or paleontological importance?		X				
b. Physical change that would affect unique cultural values?		X				
c. Effects on existing religious or sacred uses of a site or area?		X				
d. Will the project affect historic or cultural resources?		X				

13. SUMMARY EVALUATION OF SIGNIFICANCE **Will the proposed action, considered as a whole:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Explanation Index**
a. Have impacts that are individually limited, but cumulatively considerable? (A project or program may result in impacts on two or more separate resources which create a significant effect when considered together or in total.)		X				
b. Involve potential risks or adverse effects which are uncertain but extremely hazardous if they were to occur?		X				
c. Potentially conflict with the substantive requirements of any local, state, or federal law, regulation, standard or formal plan?		X				
d. Establish a precedent or likelihood that future actions with significant environmental impacts will be proposed?		X				
e. Generate substantial debate or controversy about the nature of the impacts that would be created?			X		YES	13e
f. Is the project expected to have organized opposition or generate substantial public controversy? (Also see 13e)			X		YES	see 13e
g. List any federal or state permits required.						13g

Comment 13e: The use of fish toxicants to remove non-native trout has been controversial for other projects in Montana. To mitigate the potential controversy associated with the use of antimycin or rotenone in Soda Butte Creek, FWP will coordinate activities with the USFS, Gallatin National Forest and the National Park Service. This document will be distributed to Cooke City and Silver Gate residents and other potentially concerned persons. Public meetings will be held in Cooke City to answer questions and address concerns of the citizens of Cooke City and other interested parties.

Comment 13g: The following will be required:

- DEQ 308 - Department of Environmental Quality (authorization for exemption to water quality standards for use of a fish toxicant in state waters)

- Letter of support for the use of piscicides on National Forest Lands from the Gallatin National Forest.

PART IV. ENVIRONMENTAL ASSESSMENT CONCLUSION SECTION

A) Is an EIS required? No

This environmental review demonstrates that the impacts of this proposed project are not significant. The proposed action would benefit YCT in Soda Butte Creek with minimal impact on the physical, biological, or the human environment.

B) Public Involvement.

The Final EA for the Yellowstone Cutthroat Trout Recovery Project in Soda Butte Creek will be released for a 30-day public comment period beginning _________ 2004. A public meeting will be scheduled to answer questions and address concerns. Additional meetings may be held if warranted. Public notification of the proposed action will be completed via press releases to south-central Montana newspapers, and a Legal Notice in the Billings Gazette. EA's will be sent to individuals who have expressed an interest in the YCT recovery program in Soda Butte Creek. The Cooke City Chamber of Commerce will be notified of the project and public meeting and invited to comment.

C) Duration of the comment period?

Public comment will be accepted through _______, 2004

D) Name, title, address and telephone number of the Person Responsible for Preparing the EA Document.

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