Draft

ENVIRONMENTAL ASSESSMENT

ELKHORN MOUNTAINS WESTSLOPE CUTTHROAT TROUT RESTORATION PROGRAM

Mountain Range Programmatic Assessment

April 28, 1999

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DRAFT
MONTANA FISH, WILDLIFE & PARKS
FISHERIES DIVISION

Environmental Assessment

WESTSLOPE CUTTHROAT TROUT RESTORATION PROGRAM IN THE ELKHORN MOUNTAINS

Executive Summary
April 28, 1999

The Montana Fish, Wildlife & Parks (FWP), U.S. Forest Service (FS), and Bureau of Land Management (BLM) are proposing a mountain-range wide strategy for increasing the distribution and abundance of westslope cutthroat trout (WCT) populations in the Elkhorn Mountains. Implementation of the program would include construction and installation of fish barriers; removal of non-native fishes by electrofishing and through the application of a fish toxicant. The program would also include inventory, data collection, and monitoring.

The decision that will be made from the analysis (which is documented in an Environmental Assessment or EA) is programmatic in nature, and it will define the scope and intensity of work and establish a priority listing and time table for implementation of projects. Individual projects on specific streams will be analyzed at a more site-specific level and will follow standard Montana Environmental Policy Act (MEPA) and/or National Environmental Policy Act (NEPA) procedures.

The management goal for Montana's Statewide Plan for WCT restoration is to ensure the long-term self-sustaining persistence of the subspecies within each of the five major river drainages they historically inhabited in Montana (Clark Fork, Kootenai, Flathead, upper Missouri, and Saskatchewan). The statewide plan also seeks to maintain the genetic diversity and life history strategies represented by the remaining WCT populations, and avoid listing of the species under the Endangered Species Act (ESA). The Elkhorn Mountain restoration program is consistent with statewide efforts to conserve westslope cutthroat trout.

This program focuses on a geographic area (the Elkhorn Mountains) with distinct genetic resources, rather than on individual watersheds. Two action alternatives (Alternatives 2 and 3) are presented in the EA, and both would result in reducing the relative risks of extinction of WCT in the Elkhorn Mountains. However, the risk that WCT populations would go extinct in the Elkhorn Mountains is largely dependant on the amount of project work accomplished during the 10-year program. The more comprehensive alternative (Alternative 3) would result in a more secure genetic reserve of WCT in the Elkhorn Mountains by the end of this 10 year program.

Implementation of Alternative 2 would stabilize existing WCT populations and replicate one existing genetic pool into a suitable stream, but would not result in establishing a connected population in the Elkhorn Mountains. In addition to securing existing populations and introducing WCT to five additional streams, Alternative 3 proposes to establish connected WCT populations in the McClellan and upper Crow Creek watersheds. Successful establishment of WCT populations in inter-connected drainages is the best known tool for reducing risk of extinction and this strategy also helps meet statewide objectives for WCT in the upper Missouri basin.

The environmental review demonstrates that the impacts of the alternatives analyzed in this program are not significant. Although there are no project costs, the predicted consequence of the "No Action" alternative is a high probability that many of the westslope cutthroat trout populations in the Elkhorn Mountains will go extinct. The program featured in Alternative 2 is based on existing (FWP, BLM, and Forest Service) staff and budgets. However, the predicted consequence of Alternative 2 is a moderate probability that the WCT populations in the Elkhorn Mountains will go extinct. In the short-term, however, Alternative 2 would likely preserve the locally adapted genetic makeup for WCT in the Elkhorn Mountains.

If successful, the restoration program featured in Alternative 3 would secure existing WCT populations in the Elkhorn Mountains and expand the number of occupied streams and the distribution of WCT populations within occupied streams. In addition, this alternative would include the necessary data collection and work for expanded introductions and work on larger watersheds to restore connected populations in the upper Crow Creek and McClellan Creek watersheds. The predicted consequences of Alternative 3 include a low probability that WCT in the Elkhorns would go extinct. Although Alternative 3 requires additional staffing and costs, it will help achieve statewide WCT restoration and serve as a prototype for efforts in other areas of the state.

Implementation of Alternative 3 will change the relative mix of recreational fishing opportunities in Crow Creek. Most of the fishing in this watershed occurs in Tizer Lakes and in Crow Creek below the falls. Alternative 3 would replace the brook/rainbow trout fishery above Crow Creek falls with a WCT fishery. Anglers would be required to release fish caught in upper Crow Creek, but could keep WCT from the mountain lakes. Current state regulations for cutthroat include a catch and release policy for WCT in streams.

Habitat improvements are not included under either action alternative. Habitat conditions on federal lands in the Elkhorn Mountains are managed to provide healthy soil, water, and vegetation regardless of the presence of fish. In general, the habitats where WCT currently exist or would be introduced are in good condition. Where changes in local land use (on private lands) are needed to improve habitat conditions for WCT, these are negotiated and documented in a conservation agreement between FWP, the US Fish and Wildlife Service, and the local landowner, whether WCT are listed under the Endangered Species Act or remain a candidate species.

Additional meetings to accept comments and answer questions about the EA will be held in Townsend (Community Library), Helena (Forest Supervisor's Office), and Boulder (Ammen Building) from 7-9 pm on May 18, 19, and 20, respectively. A copy of the EA is available from Ron Spoon, Montana Fish, Wildlife & Parks, PO Box 1137, Townsend, Mt, 59644 (266-4237), or from Jodie Canfield, US Forest Service, 415 Front Street, Townsend, Mt, 59644 (266-3425).

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April 28, 1999

PART 1. PROPOSED ACTION DESCRIPTION

A. Type Of Proposed Action: This program focuses on securing existing westslope cutthroat trout populations in the Elkhorn Mountains (Figure 1) by expanding their distribution in currently occupied stream systems and increasing their isolation from non-native fishes. In addition, implementation of the program would result in the introduction of westslope cutthroat trout into reaches of one to six suitable streams. Implementation of the program would include construction and installation of fish barriers; removal of non-native fishes by electrofishing and/or the use of fish toxicants; and inventory, data collection, monitoring, and education.

B. Authority: The Montana Fish, Wildlife & Parks (FWP) "...is hereby authorized to perform such acts as may be necessary to the establishment and conduct of fish restoration and management projects...." under MCA 87-1-702.

C. Name and Location of the Project: *Elkhorn Mountains Westslope Cutthroat Trout Restoration Program.* This island mountain range is in southwest Montana near the capital of Helena. It includes 160,000 acres of lands managed by the Helena and Beaverhead-Deerlodge National Forests and approximately 70,000 acres managed by the Bureau of Land Management (BLM).

D. Estimated Commencement Date: Summer 1999

Estimated Completion Date: 2011

E. Project Size (acres affected)

1. Developed/residential - 0 acres
2. Industrial - 0 acres
3. Open Space/Woodlands/Recreation - 0 acres
4. Wetlands/Riparian - 15-63 miles of streams in the Elkhorn Mountains
5. Floodplain - < 5 acres (barrier installation)
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, including the Benefits and Purpose of the Proposed Action:

1. Narrative Summary

Two alternatives are presented relative to the WCT restoration program in the Elkhorn Mountains. Both reduce the relative risks of extinction in the Elkhorn Mountains. However, Alternative 3 is more comprehensive and would result in establishing the Elkhorn Mountains as a stronghold for WCT.

The decision that will be made from this analysis is programmatic in nature. That is, we are deciding on a program of restoration. Individual projects on specific streams will be analyzed at a more site-specific level and will follow standard MEPA and/or NEPA procedures.

This restoration effort tiers to and is supported by other statewide efforts to conserve westslope cutthroat trout, including the DRAFT WCT Conservation Agreement of June 1, 1998 and January 1999. A memorandum of understanding (MOU) outlining the roles and responsibilities between FWP, the Forest Service, and the BLM, relative to the management of WCT in the Elkhorn Mountains was first signed in 1996 and is being updated to reflect this analysis. The updated MOU will be included in the Decision Notice for this project.

The restoration program includes the use of three primary tools, in addition to monitoring: 1) isolation of WCT from other salmonid species; 2) removal of non-native fishes; and 3) increasing the distribution of WCT in the Elkhorns. These tools are further described below.

a) Isolation

To isolate WCT from other salmonid species, this program will include the construction and placement of barriers such as drop structures, the placement of perched culverts, or the fortification of natural barriers (eg. debris dams). All barriers will be designed and placed to keep non-native fish from upstream migrations after removals. Barriers are not expected to prevent downstream losses of WCT.

b) Non-native Removals

The conservation agreement and management plan for westslope cutthroat trout in Montana (FWP, June 1998 draft), states " the introduction of non-native species that compete with, prey on, and hybridize with WCT into historical WCT waters is probably the greatest threat to WCT in Montana." Hybridization with introduced species (rainbow and Yellowstone cutthroat trout) has resulted in the loss of genetic integrity which is crucial to the long-term survival of WCT populations. WCT are uniquely adapted to the specific drainages where they occur (Leary et al. 1998). Of the streams tested in Montana, only 19% have been found to be occupied by 100% pure WCT (FWP 1998).

Competition with brook trout, appears to impact WCT more than any other factor, including land use practices (Shepard et al. in prep.). Brook trout compete with WCT in headwater streams for prey and spatial resources due to their life history traits and greater habitat tolerances. Brook trout spawn in the fall and their young of the year emerge prior to WCT (spring spawners), therefore having a competitive advantage over WCT young. Due to a limited number of streams or lakes with rainbow or Yellowstone cutthroat trout, competition with brook trout, and not hybridization, is the biggest threat to WCT in the Elkhorn Mountains.

Preliminary results from projects in Muskrat Creek in the Elkhorn Mountains, and White's Gulch in the Big Belt Mountains, showed WCT populations are capable of responding within one year following a decrease

Elkhorn Fish Distribution
Existing Condition

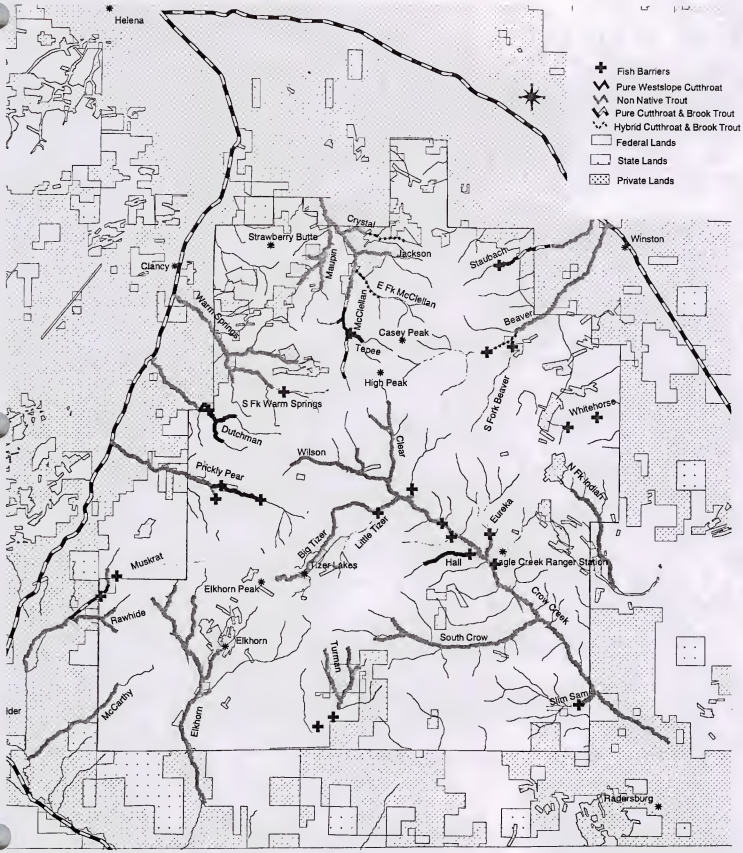

Figure 1

in the population of brook trout. Removals of brook trout will be accomplished with a combination of electrofishing, and a fish toxicant. The number of years in which electrofishing would be employed would depend on the density of WCT in each individual stream in the Elkhorns. For streams with very low density, electrofishing may be used for more than one year to boost WCT population numbers and add a measure of insurance (that is, a greater level of genetic material). In other higher density populations of WCT, it will be more efficient to use a fish toxicant to remove brook trout after only one year of electrofishing removal. The disadvantage of both removal methods is the required "handling" of both WCT and brook trout. Although it is recommended that handling of WCT be minimized, the risk of mortality is small if the fish are handled carefully.

Electrofishing - The restoration program includes the use of electrofishing as an interim tool to remove brook trout from WCT streams. Electrofishing is more successful in simple habitats (capturing 90%+ of fish residing in the stream). In streams with complex habitat, or in larger streams, electrofishing is less effective, but can be used to reduce non-native abundance. Electrofishing demands a high degree of manpower, and its effectiveness can be variable.

Due to the complexity of many of the streams with WCT in the Elkhorns, it is very unlikely that permanent and complete removal of non-natives can be accomplished with this technique.

Toxicants - The use of fish toxicants is needed to ensure the long-term removal of non-native salmonids from WCT-occupied streams in the Elkhorn Mountains. Based on monitoring and a determination that the WCT population has enough genetic material to survive minor losses, a fish toxicant will be used for 2 years. This long-term removal method requires as many WCT as possible be removed to a holding area upstream using electrofishing. Once WCT are removed, the toxicant is applied to the target stream reach, killing the brook trout outright, but with little effect on other species (see environmental impacts section). A second year of applying toxicants is needed to ensure that eggs that may have been in the gravel or large fish that may have survived the first application, are then killed (Shepard, pers. commun.). Additional information about the use and effects of toxicants is found in Appendix A and in the environmental review section of this EA.

c) WCT Introductions

To increase the distribution of WCT in the Elkhorn Mountains, this restoration program includes expanding genetic material from existing WCT populations into other suitable streams. Some of these streams are currently barren of fish, and others will require removal of nonnative fish prior to introducing WCT. This technique is referred to as "nearest neighbor" approach. In keeping with the statewide goals and objectives (discussed later in this EA), and the emphasis on preserving unique genetic material, this program proposes to use the nearest neighbor approach and not the generalist approach (i.e. introducing fish from a hatchery source such as the Anaconda hatchery). An advantage of this approach is that an existing genetically unique population is replicated in the wild. The risk of this strategy is that the donor source may be narrowly adapted to a specific environment and might not survive well in another environment (Bramblett 1998).

The healthiest WCT populations in the Elkhorn Mountains reside in Dutchman, Hall, and Prickly Pear Creeks. In these streams, streamside incubators, distributed at sites at a frequency of about one every 0.25 mile, will be used to incubate the fertilized eggs on-site. Streams targeted for introductions will be stocked with about 5 westslope cutthroat trout fry per square meter which is within the recommended range for fully stocking habitats (Everest 1969; Mabbott 1981; Shepard 1983).

To offset potential impacts to the donor population, only about half the eggs from each wild donor female will be taken to the introduction site, while the other half will be incubated and released in streamside incubators located on the donor stream. Also, eggs will be taken from only about half of the females from the donor population to ensure that enough females from the donor population remain to spawn naturally. To provide sufficient numbers of eggs for both introduction streams, and to allow natural spawning in the donor stream, will require the donor population to consist of at least 1,000 adults. An integral part of this strategy includes assessment of the impact of egg collections on donor sources.

d) Monitoring

Monitoring is critical to the success of this restoration program. Although we can estimate the number of years for using each technique in this document, on-site monitoring will ultimately determine the schedule for each stream. Two primary monitoring tools are proposed in this program. They are electrofishing and snorkelling. Snorkelling has fewer demands on manpower and/or specialized equipment, and hence is less expensive. Snorkelling is also less intrusive than electrofishing; however, snorkelling does not produce accurate sample data on size, number etc., which is possible using electrofishing.

2. Purpose and Need for the Proposed Action

a) Priorities

The primary purpose for developing a WCT restoration program is to establish priorities for work, and to develop an implementation schedule to direct efforts to conserve WCT in the Elkhorn Mountains over the next 10 years.

The following criteria are used to prioritize actions and to select projects that will maximize the benefits of our restoration efforts:

- Genetically pure populations with the highest extinction risk will be addressed first;
- The feasibility of achieving long-term benefits for WCT based on quantity and quality of habitat;
- Streams where public acceptance of removals of non-natives is acceptable;
- Sustainability of populations given quantity and quality of habitat;
- The social and biological benefits of the project outweigh the costs

The following criteria were used to help evaluate and prioritize potential introduction streams:

- Existance of beaver ponds (influences removal of brook trout);
- Isolation (is there a natural barrier present, or the potential for installing an artificial barrier?);
- Miles of suitable habitat;
- Spawning habitat - distribution and quantity;
- Frequency and quality of pool habitat ("class" and depth relative to size);
- Current public recreational use and acceptance;
- Accessibility and risk of disease or non-native fish introductions

Based on these criteria, a 10 year program of work was developed for 2 different levels of restoration (Alternatives 2 and 3) (seeAppendix B). Implementation of Alternative 2 would stabilize existing WCT populations and replicate one existing genetic pool into a suitable stream, but would not result in

establishing a connected population in the Elkhorn Mountains. Alternative 3 proposes to establish connected WCT populations in the McClellan and upper Crow Creek watersheds, in addition to securing existing populations.

b) Statewide Distribution, Status, Trends

Native fish represent important intrinsic values that cannot be recovered when lost (USDA 1996). The historic range of westslope cutthroat trout (WCT) in Montana includes the upper Missouri River drainage and the headwaters of the Marias, Judith, and Milk Rivers east of the Continental Divide (USDA 1996). Cutthroat trout were first recorded in 1805 by the Lewis and Clark expedition near Great Falls (Behnke 1992). Based on western explorer's journals, cutthroat trout were extremely abundant where they occurred. It is now estimated that this subspecies of cutthroat trout occupies less than 10% of its historic range (Montana Rivers Information System: January 1996 update). Resident cutthroat trout have been pushed into fragmented headwater habitats (Rieman et al. 1993). Their distribution and abundance within the upper Missouri River continues to decline and a recent assessment indicates most of the remaining populations are at a relatively high risk of extinction (Shepard et al. 1997).

Past and current causes of decline include habitat degradation resulting from a variety of land management practices, construction of dams and other barriers, changes in water quality and/or quantity, angling overharvest, and introduction of nonnative fishes that compete with, prey on, and hybridize with WCT (MDFWP 1998). In response to the declines of WCT, Montana Department of Fish, Wildlife and Parks (FWP) implemented a "catch and release" fishing regulation for westslope cutthroat trout in most streams and rivers within the upper Missouri River basin in beginning in 1996.

c) Elkhorn Mountain Distribution, Status, Trends

The Elkhorn Mountains provide an excellent opportunity to help recover westslope cutthroat trout. Located in southwest Montana, they include over 230,000 acres of lands managed by the Helena and Beaverhead-Deerlodge National Forests and the Bureau of Land Management (BLM). Forest system lands are known as the "Elkhorn Wildlife Management Unit".

Hadley (1981) initially surveyed fish populations in the waters of the Elkhorn Mountains. Although Hadley categorized WCT trout distribution in 1981 as "remnant", he felt that reintroductions of specimens from pure populations in the Elkhorns to suitable unoccupied habitats was the best way to secure the future survival of the species. Hadley wrote that the "Elkhorns could very well become the most diverse and secure upper Missouri cutthroat habitat within the entire original range".

Since 1981, biologists have documented that the WCT population in the South Fork Warm Springs Creek has gone extinct. All of the 6 remaining populations in the Elkhorn Mountains are at high risk for extinction.

Currently,WCT occupy 7.6 miles of the 131 miles of occupied fish habitat in the Elkhorn Mountains. They co-exist with eastern brook trout (EBT) in an additional 6.5 miles of stream. At present, only one project has been undertaken, in Muskrat Creek, to secure the WCT population deemed most at risk.

Fish

Information about westslope cutthroat trout populations on the Helena National Forest (HNF) portion of the Elkhorn Mountains (exclusive of private inholdings) is presented below in Table 1. A two-part questionaire developed by Forest Service - BLM interdisciplinary teams within the basin has been applied to known WCT populations in the Elkhorns classified as 90-100% pure. The purpose was to assess extinction risks for known Elkhorn WCT populations, utilizing a Bayesian belief model (Lee and Rieman 1994), and to assess if ongoing land and water management activities had any adverse effects on their habitat. All WCT populations in the Elkhorns were assigned either a "high" or "very high" extinction risk rating. In terms of probability, a population categorized as "high" risk has a >50-80% probability of persistence (or a 20-50% chance of going extinct) over the next 100 years. Under the "very high" risk category, a population has a 0-50% probability of persisting (or >50-100% chance of going extinct) over the same timeframe.

Table 1. WCT Population Characteristics in the Elkhorn Mountains

Stream	Fish Species*	Abundance Rating	Occupied Length (mi)	WCT Genetic Status	WCT Exinction Risk
Dutchman Creek	Wct	Abundant	2.1	100%	High
Prickly Pear Creek	EBT Wct	Common Common	1.2 1.1	100%	High
McClellan Creek	EBT Wct	Abundant Uncommon	3.3 1.8	1980 -100%** 1990 - <100%	Highest
E Fk McClellan	EBT Wct	Uncommon Uncommon	1.2 1.2	<90% pure	Highest
Crystal Creek	EBT Wct	Common Uncommon	2.1 1.7	95%	Highest
Tepee Creek	Wct	Common	0.7	98%	Highest
Willard Creek	EBT Wct	Uncommon Uncommon	0.3 0.3	Unknown	Highest
Staubach Creek	EBT Wct	Common Common	1.4 .75	100%	Highest
Beaver Creek	EBT Wct x Rb	Abundant Common	1.5	Hybrid	NA
S Fk Beaver Creek	EBT Wct x Rb	Common Uncommon	0.2 0.2	Hybrid	NA
Hall Creek	Wct EBT Rb	Common Common Rare	1.1 0.3 0.3	100%	High
Muskrat Creek***	EBT Wct	Common Uncommon	1.3 1.3 +	100%	Highest

* Wct = Westslope cutthroat trout
EBT = Eastern brook trout
Rb = Rainbow trout

Abundant = >99 fish per 1000 feet for streams 20 ft wide
Common = 20-99 fish
Uncommon = >3-19 fish
Rare = 1-3 fish

** Genetic testing of fish in McClellan Creek has been undertaken twice with different results; additional testing is needed to determine the degree of genetic purity. 1990 test results showed some a slight presence of Yellowstone CT genes.

*** Work on Muskrat Creek took place in 1997-1998 to remove brook trout from a 1.3 mile section of stream and to expand cutthroat trout into a formerly barren stretch of 3.9 miles.

Habitat

Habitat conditions on federal lands in the Elkhorn Mountains are managed to provide healthy soil, water, and vegetation regardless of the presence of fish. In general, the habitats where WCT currently exist or would be introduced are in good condition. Prickly Pear Creek has relatively high levels of fine (<0.2 inch) sediment in stream gravels, in part due to sediment delivery from the adjacent road. Specific information on habitat conditions of Elkhorn streams is available in many Forest Service documents.

Fish barriers are a component of the habitat which are important to the management of WCT in the Elkhorn Mountains. Barriers function to isolate existing, expanded, or introduced WCT populations from being invaded by nonnative fish and/or diseases. Table 2 displays the known fish barriers within the Elkhorns on federal lands.

Table 2. Fish Migration Barriers in the Elkhorn Mountains

Stream	Barrier Type	Location*	Failure Risk	Comments
Butchman Creek	Extensive Boulder Cascade	7N,3W, S3a	Very low	provides long term isolation of WCT
Prickly Pear Creek	Bedrock/Boulder Cascade	7N,2W,S15d	Low	provides long term isolation for WCT
S Fk Warm Springs Creek	bedrock outcrop	8N,2W,S36a	Very low	provides opportunity for reintroduction
Tepee Creek	log/sediment wedge	8N,3W,S21c	High	Has served to isolate WCT from EBT
EFk McClellan Creek	unsurveyed; likely cascade	8N,2W,S15a	unknown	provides opportunity for possible WCT expansion; E Fk needs additional genetic sampling
Beaver Creek	extensive series of boulder and debris cascades	8N,1W,S29b	unknown; likely low	provides opportunity for Wct introduction; may limit suitable habitat
S Fk Beaver Creek	Bedrock waterfall	8N,1W,S28b	Very low	provides opportunity for WCT introduction
Whitehorse Creek	Bedrock cascades/shoots	7N,1W,S1a	Very low	Barrier would partition an introduced population
Eureka	Bedrock waterfall	7N,1W,S29d	Very low	provides opportunity to introduce WCT into Eureka, Longfellow, Tincup, Teakettle
Hall	Culvert/Velocity barrier	7N,1W,S31a	Low	Provides isolation to existing WCT
Crow Creek	Bedrock waterfall	7N,2W,S24b	Very low	provides opportunity to isolate upper Crow watershed from brook and rainbow trout downstream
Little Tizer	Bedrock waterfall Outcrop barrier	7N,2W,S22d	Very low	provides opportunity for WCT introduction; 2nd barrier may partition introduced population
East Fork Dry	Stream goes subsurface	Variable	Very low	provides opportunity for EBT removal and WCT introduction
Muskrat Creek	Constructed barrier at Forest Boundary Natural Cascades	6N, 3W, S6c 7N, 3W, S32c	Low-Mod Very Low	keeps EBT from migrating upstream keeps WCT that were moved isolated from other WCT and EBT

* Sections were divided into quadrants with"a" representing the northeast quarter, and "b", "c", and "d" following counter-clockwise.

Table 3 outlines the known issues and concerns specific to each existing population and priority introduction stream relative to access considerations, water quality, and land jurisdiction. Access affects angling pressure and the potential for future non-native "introductions". Habitat quality, as affected by water quality and other habitat variables determine the suitability of specific streams or reaches to support WCT. Land ownership patterns affect land uses, access, and other management options.

Although livestock grazing and other land use activities (ie. recreation, mining, prescribed burning and timber harvest, and road management) occur within watersheds occupied by WCT, these activities are governed by the Land Management Plans for the Elkhorns, which include protective standards, objectives, and guidelines for the management of soil, vegetation, and water.

Table 3. Issues and concerns specific to each population and or potential introduction stream.

Stream	Access	Habitat Quality	Land Ownership Pattern	Comments
Dutchman Creek	No public access; private road below project area	Excellent habitat No water quality issues	Helena Nat. Forest in project area; BLM and private land downstream	Good potential for use as WCT "donor" source
Prickly Pear Creek	Forest recreation road parellels and crosses stream in several places; high public activity along this road	Excellent habitat Limited by granitic substrate and sediment from road	Helena Nat. Forest in project area; one private inholding; private land below project area	Good potential for use as WCT "donor"source
S Fk. Warm Springs Creek	Forest trail access only; very low public activity	Excellent habitat; some question about sufficiency of flows and overwintering habitat	Helena Nat. Forest in project area; private for short section before joining main Warm Springs Creek	Lower portion had WCT population that is now exclusively brook trout
McClellan Creek and tribs	Forest Road access in lower reaches; trail access in headwaters; moderate public activity in this area	Excellent habitat Granitic substrate No water quality issues	Helena Nat. Forest in headwaters; project potentially includes private land	High priority to establish connected system for WCT; classified as municipal watershed; mixed genetic purities
Staubach Creek	Pole Creek Road crosses upper reach; other access is private only; very little public activity in project reach	Variable, but generally good; limited quality pools; no water quality issues	Helena Nat. Forest in headwaters; project area includes 3 private ranches	High priority WCT project
Beaver Creek	Forest trail access on public portion; low public activity on forest; moderate below	Excellent habitat - some question about steep gradients; Vosburg Mine (reclaimed) in headwaters of South Fork - water quality marginal in that tributary	Helena Nat. Forest in project area; private downstream	Opportunity for connected system for WCT; hybrid WCT/rainbow below project area
Whitehorse Creek	Forest road access spring at source; otherwise no public access and very little public activity	Good habitat - some question about sufficiency of pools for overwintering fish; has a partitioning Barrier; Kleinschmidt Mine near headwaters, but water quality is good	Helena Nat. Forest in headwaters; private downstream	Potential introduction site
N. Fk. Indian Creek	Forest Road access follows creek	Good habitat; several miles of the creek is excluded from livestock grazing by a wire fence. Recently reclaimed mine tailings in headwaters and along creek;	BLM and Helena Nat. Forest for most of length; some private at head (Park Mines)	Replacement opportunity; currently supports EBT;
Eureka Creek and tribs	Forest trail access only; moderate public activity	Good habitat - some question about sufficiency of pools for overwintering fish; some historical placer mining	Helena National Forest the entire length	Potential introduction site; invertebrate and amphibian surveys are complete

Table 3 cont.

Hall Creek	Forest Road 424 crosses once; otherwise no access and low public activity	Fair to good habitat No water quality issues	Helena Nat. Forest for entire length	Good potential for use as WCT "donor" source
upper Crow Creek	Accessible only by trail into Tizer Basin and then by jeep road to Tizer Lakes; moderate to high public activity	Excellent habitat	Helena Nat. Forest; Tizer lakes are owned by FWP	Opportunity for connected system of WCT; currently occupied by brook and rainbow trout; beaver complex in Wilson Creek could make removal of EBT difficult; Requires converting lakes to WCT
Little Tizer	Old road to Tizer Mine; otherwise trail access only; low public activity	Excellent habitat; Little Tizer Wildcat Mine in headwaters- sampling indicates good water quality above and below the mine	Helena Nat. Forest entire length	Tributary of Crow Creek; isolated by 50' waterfall
East Fork Dry	Seasonally restricted 2-track road which lacks legal public access; moderate public activity	Good habitat; livestock exclosure in place on one reach; limestone substrate	Beaverhead-Deerlodge Nat. Forest in headwaters; BLM and private downstream	Replacement opportunity; currently supports EBT; stream goes subsurface before reaching Boulder River
Muskrat	Accessible from road and trail; high public use in lower project stream reaches	Excellent habitat Limited by granitic substrate	Beaverhead-Deerlodge Nat. Forest, BLM in WCT section; below barrier is private	Two years of implementation completed; on-going project

3. Benefits of the Project

a) Statewide Goals and Objectives

The Statewide "Conservation Restoration Plan" was introduced in 1997 at the Govenor's Conference on Westslope Cutthroat Trout. The Westslope Cutthroat Trout Steering Committee developed a management goal and objectives for WCT in Montana. The basic premise of the management goal for WCT presented below is to protect existing populations, and ensure the long-term persistence of WCT throughout their historic range in Montana, thus avoiding listing of the species under the Endangered Species Act (ESA). The third draft (FWP, January 1999) of the Conservation Agreement for WCT in Montana lists the following goal and objectives:

Statewide Goal: The management goal for WCT in Montana is to ensure the long-term self-sustaining persistence of the subspecies within each of five major river drainages thaey historically inhabited in Montana (Clark Fork, Kootenai, Flathead, upper Missouri, and Saskatchewan), and to maintain the genetic diversity and life history strategies represented by the remaining populations.

Statewide Objectives:

1. Protect all existing pure WC T populations (known as of 1/1/99)

2. Protect introgressed (greater than or equal to 90%) pure populations

3. Ensure the long-term persistence of the WCT within their native range

4. Provide technical information, administrative assistance, and financial resources to assure compliance with the listed objectives and encourage conservation of WCT

5. Design and implement an effective monitoring program by the year 2002 to document persistence and demonstrate progress towards goal

Within the Missouri River drainage, the objective is to establish four interconnected populations which occupy at least 50 miles of connected habitat.

b) Elkhorn Mountain Program Goals And Objectives

Program Goal: The overall goal of the Elkhorn Program is to maintain and expand existing WCT populations as a genetic reserve

The cooperating agencies are proposing to maintain and enhance genetically-pure westslope cutthroat trout populations in an attempt to secure long-term viability of the species in the Elkhorn Mountains and decrease the risk of exinction (ratings) in the existing populations.

Program Objectives:

1) Increase the exclusively WCT cutthroat-occupied stream miles from 7 miles to at least 20 miles.

2) Increase the number of WCT streams/populations from 6 to at least 9.

Both Alternatives 2 and 3 would help achieve the goals and objectives both for the Elkhorn Mountains and the state, relative to management of WCT. Both alternatives would result in reducing the relative risks of extinction of WCT in the Elkhorn Mountains, and potentially help keep the species from being listed under ESA. The risk that WCT populations would go extinct in the Elkhorn Mountains is largely dependent on the amount of project work accomplished during the 10-year program. The more comprehensive alternative (Alternative 3) would result in a more secure genetic reserve of WCT in the Elkhorn Mountains by the end of this 10 year program. Alternative 3 would also help meet statewide objectives for connected populations of WCT in the upper Missouri basin.

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

U.S.D.A. Forest Service - The Beaverhead-Deerlodge and Helena National Forests, as well as the U.S. D. I. Bureau of Land Management (BLM), manages the land base over most of the reaches targeted for WCT. The Forest Service does not have regulatory authority to approve or disapprove the removal of existing fish species. FWP has statutory authority for management of fish populations in the state of Montana. Montana Department of Environmental Quality (DEQ) - DEQ has permitting authority for water quality in the State of Montana.

H. Agencies Consulted During the Preparation of the EA

U.S.D.A. Forest Service

U.S. D. I. Bureau of Land Management

U.S. Fish and Wildlife Service

Montana State University

Montana State Historic Preservation Office

Montana Department of Environmental Quality

PART II. ENVIRONMENTAL REVIEW

A. PHYSICAL ENVIRONMENT

1. AIR Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Emission of air pollutants or deterioration of ambient air quality? (also see 13 (c))		X				
b. Creation of objectionable odors?		X				
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. For P-R/D-J projects, will the project result in any discharge which will conflict with federal or state air quality regs? (Also see 2a)		X				
f. Other _____		X				

2. LAND RESOURCES Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment 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			2b
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				
f. Other _____		X				

Comment 2b: Some areas will be disturbed through barrier placement. However, disturbed areas will be returned to previously existing conditions by standard reclamation techniques such as placing biodegradable erosion-control fabrics and revegetation of disturbed soils.

3. WATER Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Discharge into surface water or any alteration of surface water quality including but not limited to temperature, dissolved oxygen or turbidity?			X		NO	3a
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				3f
g. Changes in the quantity of groundwater?		X				
h. Increase in risk of contamination of surface or groundwater?		X				
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				3j
k. Effects on other users as a result of any alteration in surface or groundwater quantity?		X				
l. For P-R/D-J, will the project affect a designated floodplain? (Also see 3c)			X		YES	3l
m. For P-R/D-J, will the project result in any discharge that will affect federal or state water quality regulations? (Also see 3a)			X		NO	3a
n. Other: _____		X				

Comment 3a: Surface water quality: A principal element of the proposed program is the use of fish toxicants, including antimycin at a concentration of 8 to 12 parts per billion, possibly rotenone at a concentration of 0.25 to 1.0 parts per million, as well as potassium permanganate (KMnO4) at a concentration of 1 to 4 parts per million as a means to deactivate the fish toxicants. However, this will be only a minor impact on the water quality for several reasons. Concentrations of antimycin, rotenone and potassium permanganate will be very low, rotenone and potassium permanganate in the parts per million, and antimycin in the parts per billion. These chemicals will be introduced into the water for short periods of time. Apart from their intended toxic effect on fish, the chemicals are relatively benign in the environment. Antimycin breaks down rapidly in the environment (Walker et al. 1964; Lee et al. 1971; Marking and Dawson 1972; Schnick 1974a). The label for Fintrol, the commercial formulation of antimycin, states that once diluted in water, Fintrol must be used within eight hours to ensure its potency, and that treated waters

may usually be restocked within one week following treatment. However, in high-gradient and turbulent streams antimycin loses its toxicity over stream reaches with about 200 feet of vertical relief (Tiffan and Bergersen 1996; Bramblett 1998).

In many of the streams in the Elkhorns, antimycin will lose its toxicity so rapidly that it will have to be recharged at drip stations along the streams. Moreover, its breakdown products are non-toxic (Herr et al. 1967). If rotenone is used, it will be detoxified with potassium permanganate as described in the Narrative Summary.

To reduce the potential risks associated with the use of antimycin, rotenone, or potassium permanganate, the following mitigation measures will be employed:

1. Chemicals will be diluted in water and dripped into the stream at a constant rate using a device that maintains a constant head pressure.
2. A detoxification station will be set up downstream of the target reach. Potassium permanganate will be used to neutralize fish toxicants at this point.
3. Project personnel will be trained in the use of these chemicals including the actions necessary to deal with spills; personnel will wear rubber gloves and safety goggles.
4. No more chemical than needed for immediate use will be held near the stream
5. Through coordination with livestock permittees and local landowners, livestock will be excluded from streams during the time period (1-2 days) when a toxicant is used.

Comment 3f: Changes in groundwater quality: If surface waters within the Elkhorns infiltrate into groundwater, the groundwater would be affected. However, as with surface water quality, these effects will be minimal (see comment 3a).

Comment 3j: 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 1974a; Schnick 1974b). However, the product label for the commercial form of antimycin, Fintrol recommends that treated water not be used for drinking. Mitigation: Public users of Forest Service roads and trails will be notified of stream treatments during application of antimycin and dyes by posting signs. Signs will describe the chemicals being used and warn against drinking stream water.

4. VEGETATION Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment 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					4c
d. Reduction in acreage or productivity of any agricultural land?		X				
e. Establishment or spread of noxious weeds?			X		X	4e
f. For P-R/D-J, will the project affect wetlands, or prime and unique farmland?		X				
g. Other: _____		X				

Comment 4c: Any disturbances associated with fish barrier construction are anticipated to be minor and localized. However, because specific fish barrier locations have not been identified, and site-specific fish barrier plans and rare plant surveys have not been done, potential impacts associated with barrier construction on rare plants are unknown.

Comment 4e: During the installation of barriers, there will some ground disturbing activities. To reduce the risk of noxious weed invasion or spread, all equipment will be cleaned before arrival on site; all bare soil will be seeded with native vegetation; and the sites will be monitored for weeds for 2 years following disturbance.

5. FISH/WILDLIFE Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Deterioration of critical fish or wildlife habitat?		X				
b. Changes in the diversity or abundance of game animals or bird species?			X			5b
c. Changes in the diversity or abundance of nongame species?			X			5c
d. Introduction of new species into an area?			X			5d
e. Creation of a barrier to the migration or movement of animals?			X			5e
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. For P-R/D-J, 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. For P-R/D-J, will the project introduce or export any species not presently or historically occurring in the receiving location? (Also see 5d)		X				
j. Other: _____		X				

Comment 5b: The application of a fish toxicant in some streams in the Elkhorn Mountains will result in the elimination of species of game fish, most notably brook trout, but also rainbow trout in upper Crow Creek (Alternative 3 only). Brook trout are located in many "non-target" streams throughout the Elkhorns and in adjacent mountain ranges, so this program will not result in a significant decrease in their distribution or abundance. Rainbow trout would be maintained in lower Crow Creek. The following changes in distribution are predicted under each alternative:

Alternative	Miles WCT alone	Miles Mixed WCT/EBT	Miles Non-Native Trout
Existing	7.6	6.5	112
Alt 2	21.5	0	112
Alt 3	69	0	78

Comment 5c: Aquatic Invertebrates: Most studies have found that at proposed levels, antimycin is harmless to most aquatic invertebrates found in streams and standing waters (Walker et al. 1964; Herr et al. 1967; Schnick 1974a; Houf and Campbell 1977). A study in a Wisconsin trout stream did find temporary reductions in aquatic invertebrates including certain caddisflies, a cranefly, a mayfly and a scud (Jacobi and

Degan 1977). However, concentrations of antimycin in this stream reached as high as 44 parts per billion, about 4 times higher than the proposed concentration for this project.

Certain invertebrates will probably be affected at the proposed levels of antimycin, including Cladocera and Copepoda (zooplankton), Amphipoda (scuds), and certain mayflies and caddisflies, although populations of these taxa are only diminished temporarily (Schnick 1974a). Bruce Rosenlund, USFWS Biologist with extensive experience with antimycin treatments in Colorado, has observed that the effect of antimycin on aquatic invertebrates is more severe in waters with a pH at or below 7.0. Hoever, he has also observed that these invertebrate populations recover rapidly.

In general, most studies report that aquatic invertebreates, except zooplankton are much less sensitive to rotenone treatment than fish (Schnick 1974a). Engstrom-Heg et al. (1978), reported that the long-term impacts of rotenone are mitigated because those insects that were most sensitive to rotenone also tended to have the highest rate of recolonization. The authors of this study also suggest that it is probable that in most streams, only mild and temporary damage to aquatic invertebrates would occur in treatments using rotenone at levels ten times higher than the levels proposed for this project. Because of their short life cycles (Anderson and Wallace 1984), good dispersal ability (Pennack 1989), and generally high reproductive potential (Anderson and Wallace 1984), aquatic invertebrates are capable of rapid recovery from disturbance (Jacobi and Deegan 1977; Boulton et al. 1992; Johnson and Vaughn 1995; Matthaei et al. 1996; Nelson and Roline 1996).

Amphibians: the status and distribution of amphibians over much of the Elkhorn Mountains is not known. However, at a site-specific level for each project, amphibian surveys will be done before and after treatments with fish toxicants. Reports in the literature indicate that antimycin has no effect on amphibians at the proposed concentrations of 8 to 12 ppb (Walker 1964; Schnick 1974a). For example, tiger salamanders survived exposure at 80 ppb for 96 hours, while bullfrog tadpoles survived 20 ppb, but perished when exposed to 40 ppb for 24 hours (Walker 1964). The LC50 (lethal concentration at which 50% of tested organisms die) for leopard frogs was from 48 to 59 ppb in water of varying hardness (Lesser 1972, cited in Schnick 1974a). No information on antimycin toxicity to spotted frogs, chorus frogs or western toads could be located, but toxicity is probably similar to other frog species. Rotenone is toxic to most gill-breathing larval amphibians, but is not harmful to adults (Schnick 1974b), except tiger salamanders (Hamilton 1941, cited in Schnick 1974b). However, because the toxicant treatments will generally take place in August or September, is it likely that the majority, if not all amphibians will have metamorphosed into adults by this time.

Reptiles: The literature on antimycin toxicity reports no effect for reptiles, but is limited to unspecified turtles, snapping turtles and a water snake, at concentrations of antimycin up to 10 ppb (Schnick 1974a). Reptiles are apparently not affected by rotenesting of antimycin, none of the tests showed any effect of antimycin on birds or mammals. This review included studies that examined direct exposure to water and eating fish killed by antimycin. In addition, she reported on toxicology studies that calculated the LD50 (dose at which 50% of tested individuals die) with direct feeding of antimycin to birds and mammals. LD50duced, will likely expand into a large area of previously unoccupied habitat.

Comment 5d: This program includes the introduction of WCT into several waters currently barren of trout species. It is unknown if WCT never occupied these areas due to a significant barrier, or if they were historically present at one time. Some streams currently barren of fish will stay that way and will function as refugia for species that may be adversely affected by fish.

Comment 5e: The proposed action will create 2 barriers to prevent upstream migration of brook trout and rainbow trout into waters occupied by WCT.

Comment 5f: This proposed action is expected to result in an increase in native westslope cutthroat trout in the Elkhorn Mountains. There are no effects on any other threatened, endangered, or sensitive wildlife or fish species. Westslope cutthroat trout are a unique and potentially endangered environmental resource with limited distribution. The change in abundance and distribution will help insure long-term viability in the Elkhorn Mountains.

B.HUMAN ENVIRONMENT

6. NOISE/ELECTRICAL EFFECTS Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment 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				
e. Other: _____		X				

7. LAND USE Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Alteration of or interference with the productivity or profitability of the existing land use of an area?	X					7a
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				
e. Other: _____		X				

Comment 7a: As mentioned earlier in this document, by removing brook trout, the project is likely to be successful in securing the population of WCT in several streams in the Elkhorn Mountains. The habitats where WCT currently exist or would be introduced are generally in good condition. Changes in land use or enhancement of fish habitat should not be necessary to secure WCT in the Elkhorn Mountains. If changes in local land use (on private lands) are needed to improve habitat conditions for WCT, these are negotiated and documented in a conservation agreement between FWP, the US Fish and Wildlife Service, and the local landowner, whether WCT are listed under the Endangered Species Act or remain a candidate species.

8. RISK/HEALTH HAZARDS Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment 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				
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	8a
d. For P-R/D-J, will any chemical toxicants be used? (Also see 8a)			X		YES	2a
e. Other: _____		X				

Comment 8a: Chemical toxicants will be used in during this program under either action alternative. Please refer to Comment 3a for mitigation measures that will be employed to reduce the potential hazards of handling these chemicals.

9. COMMUNITY IMPACT Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment 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?						
f. Other: _____		X				

10. PUBLIC SERVICES/TAXES/UTILITIES Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment 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				
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			10e
f. Define projected maintenance costs			X			10f
g. Other:_____		X				

Comment 10e: This proposed projects would be funded cooperatively, with funds contributed by the the Forest Service, BLM, and State FWP money through the Future Fisheries Improvement Program. Program management will include applying for grants and seeking partnerships with private groups and individuals. Implementation of the program outlined in Alternative 2 will require about 150 person days from agency staff biologists and volunteers. Alternative 3 will require 150 person days from agency staff biologists and volunteers, and also to hire 2 seasonal biologists to work for 4 months each year, as well a 2-year graduate student project to help with monitoring. The cost of the fish toxicant will vary each year depending on the size and flow of the streams to be treated. The cost to treat 1.5 miles of a stream with a flow of 3-5 cfs (eg. Staubach Creek) would be approximately $4,000 for one year. Total estimated costs for fish toxicant in Alternative 2 is $60,000. The costs to implement Alternative 3 are estimated as follows:

2 seasonals for 10 seasons - $100,000
graduate student for 2 years - $40,000
fish toxicant - $250,000

Comment 10f: Maintenance would include both periodic checking and cleaning of barriers and monitoring of the fish. This will be accomplished by agency staff biologists as part of their regular duties, as well as volunteers in Alternative 2, and by seasonal fisheries staff under Alternative 3.

11. AESTHETICS/RECREATION Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment 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	ALT 3			11c
d. For P-R/D-J, will any designated or proposed wild or scenic rivers, trails or wilderness areas be impacted? (Also see 11a, 11c)		X				
e. Other: _____		X				

Comment 11c: Implementation of Alternative 3 will change the relative mix of recreational fishing opportunities in Crow Creek. Most of the fishing in this watershed occurs in Tizer Lakes and in Crow Creek below the falls. Alternative 3 would replace the brook/rainbow trout fishery above Crow Creek falls with a WCT fishery. Current state regulations for cutthroat include a catch and release policy for WCT in streams. This regulation is restrictive enough to support this restoration program. The eventual goal is to restore WCT populations to levels that will accomodate angling. Anglers may catch and keep WCT from mountain lakes.

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. For P-R/D-J, will the project affect historic or cultural resources? **Attach SHPO letter of clearance.** (Also see 12.a)	X					12d
e. Other: _____		X				

Comment 12d: Consultation with SHPO will be completed prior to implementation of individual projects.

13. SUMMARY EVALUATION OF SIGNIFICANCE Will the proposed action, considered as a whole:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment 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					13a
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	ALT 3 .			13e
f. For P-R/D-J, is the project expected to have organized opposition or generate substantial public controversy? (Also see 13e)		X				
g. For P-R/D-J, list any federal or state permits required.						13g

Comment 13a: All of the anticipated impacts of the program are minor. However, the impact of WCT introductions into currently barren habitats are unknown, but inherent to the overall goal of the proposed program. The proposed program, considered as a whole, is not anticipated to result in impacts that are cumulatively considerable.

Comment 13e: There has not been controversy generated by any of the WCT projects in the Elkhorns thus far. However, to date fish toxicants have not been used in the Elkhorn Mountains. The recently proposed Cherry Creek project near Bozeman generated controversy about the use of toxicants. That project involved a large watershed within designated wilderness where existing game fish were to be removed and replaced with native species. The program proposed under Alternative 2 for the Elkhorns does not target any popular "sport-fisheries". However, Alternative 3 may generate controversy relative to replacing brook trout with WCT in Tizer Lakes and in Crow Creek above the falls. Since anglers can keep WCT from mountain lakes, this should be a relatively minor impact.

Comment 13g: The following list of permits will be required:

FG 124 - FWP (Stream Protection Act Permit)

3B - Department of Environmental Quality (authorization for use of a fish toxicant)

404 - Army Corp of Engineers (discharge of fill into wetland areas required for installation of fish barriers.

PART III. Discussion and Evaluation of Reasonable Alternatives

Three alternatives were considered during preparation of the Environmental Assessment.

Alternative 1 - No Action (see Figure 1).

The predicted consequences of the "No Action" alternative are:

a. A high probability that many of the westslope cutthroat trout populations in the Elkhorn Mountains will become extinct.

b. No costs associated with implementation efforts.

Alternative 2 - Maintenance of Genetic Reserves (see Figure 2)

The program featured in this alternative (see Table 5) is based on existing (FWP, BLM, and Forest Service) staff and budgets. This alternative focuses attention on the highest risk existing WCT populations to increase their isolation from non native fishes. It includes replication of the existing genetic reserves by moving WCT from existing streams into Eureka Creek. The predicted consequences of Alternative 2 are:

a. A moderate probability that westslope cutthroat trout populations in the Elkhorn Mountains will become extinct.

b. No costs associated with hiring additional staff

c. Preservation of the locally adapted genetic makeup for westslope cutthroat trout in the Elkhorn Mountains in the short-term.

Alternative 3 - Comprehensive Restoration Program (see Figure 3)

Alternative 3 (Table 6) would require hiring additional staff to fully implement a restoration program that includes securing existing WCT populations in the Elkhorn Mountains, expanding the distribution to increase WCT-occupied streams from 7.6 to 69.2 miles, and increasing the number of WCT streams/populations from 6 to 12 watersheds. This alternative would include additional data collection and identification, and work on additional opportunities for WCT introductions. Under Alternative 3, work would occur in larger watersheds to restore connected populations in upper Crow and McClellan Creeks. The predicted consequences of Alternative 3 are:

a. Greater liklihood of a successful program, including a low probability that WCT in the Elkhorns would go extinct. Through increased staffwork and presence, monitoring, and data collection, this alternative will result in establishing a level of credibility with the public, and serve as a prototype for other WCT restoration efforts.

b. Cost to hire staff to work specifically on Elkhorns seasonally each year

Elkhorn Fish Distribution
Alternative 2

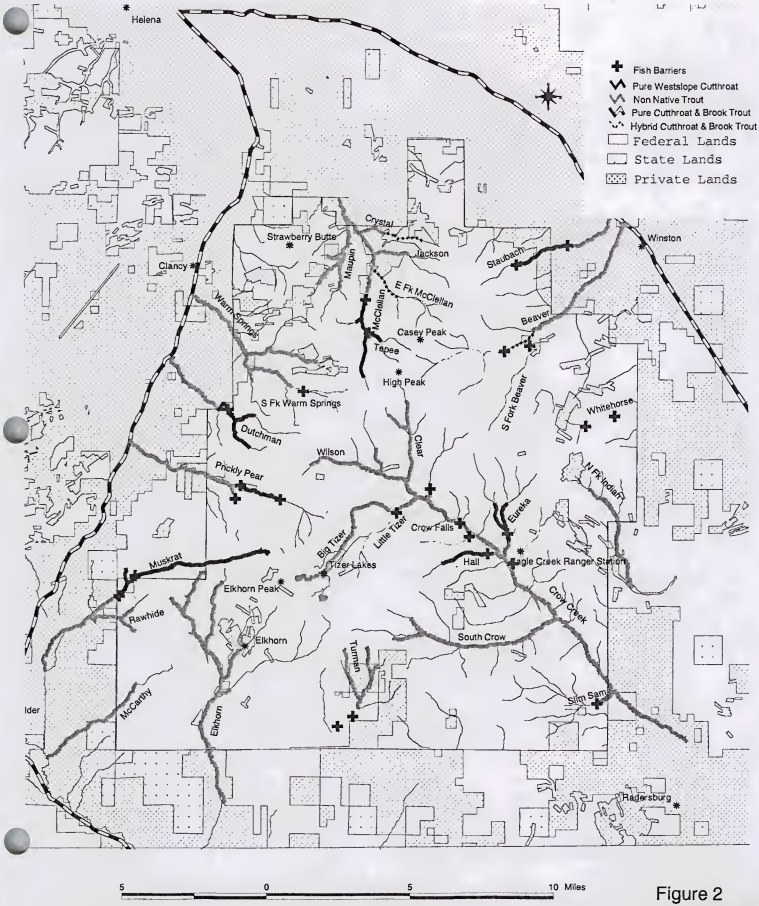

Figure 2

Elkhorn Fish Distribution
Alternative 3

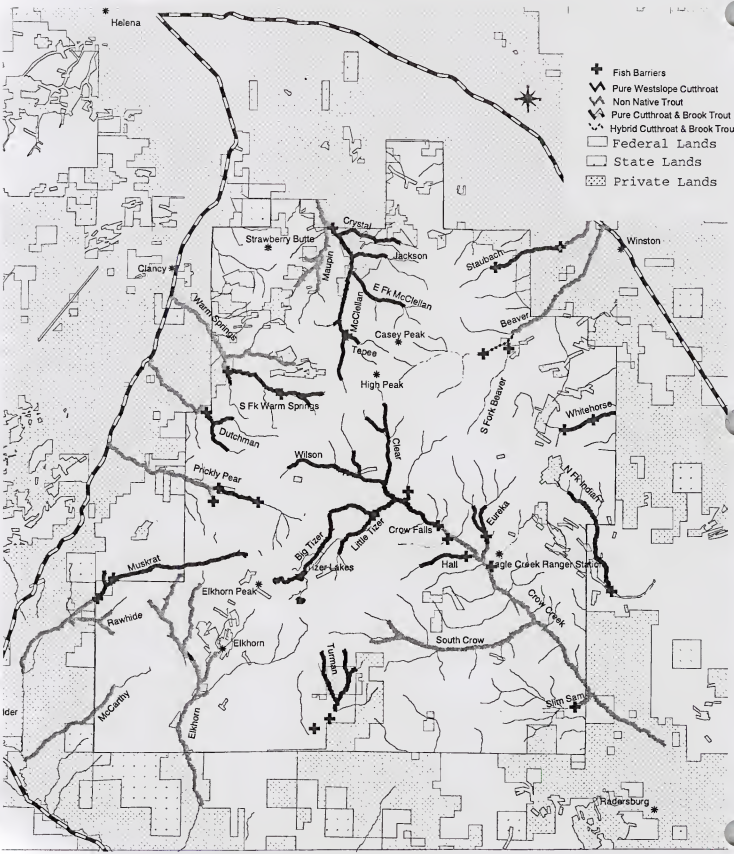

Figure 3

c. Greater level of controversy in working with larger streams and/or lakes that may be popular recreational fisheries.

d. In addition to preservation of the genetic resources in the Elkhorn Mountains, this alternative would help achieve a statewide objective for the upper Missouri River by providing for one or more interconnected populations in larger watersheds.

PART IV. Environmental Assessment Conclusion Section

1) Is an EIS required? No

This environmental review demonstrates that the impacts of a restoration program for WCT in the Elkhorn Mountains are not significant.

2) Describe the level of Public Involvement.

Public involvement regarding westslope cutthroat trout projects in the Elkhorn Mountains included an informational mailing and three public scoping meetings located in Townsend, Helena and Boulder to assess public concern. Written comments were received from 46 individuals and organizations. Additional meetings to accept comments and answer questions about this EA will be held in Townsend (Community Library), Helena (Forest Supervisor's Office), and Boulder (Ammen Building) on May 18, 19, and 20, respectively from 7-9 pm. News releases will appear in local papers around the mountain range. Legal notices soliciting comments will be published in the *Helena Independent Record*, and on the State Bulletin Board. This EA will be mailed to MFWP's MEPA mailing list and to approximately 70 citizens and groups who have interest in WCT and the Elkhorn Mountains. The public issues previously expressed included the following:

- extinction risks of a native sensitive species;
- impact on existing recreational fisheries;
- cost of restoration versus putting money into recreational fisheries;
- effect of cutthroat introduction on invertebrate and/or amphibian species;
- effects to livestock permittees or other Elkhorn users;
- sources of pure genetic cutthroat stock;
- effectiveness and impacts of various methods of removing brook trout
- effects of barriers on other native fish (sculpins);
- effects on angling*

*NOTE: Current state regulations for cutthroat include a catch and release policy for WCT in streams. This regulation is restrictive enough to support this restoration program. The eventual goal is to restore WCT populations to levels that will accomodate angling. Anglers may catch and keep WCT from mountain lakes.

3) Duration of the comment period?

This EA is subject to a 30 day public comment period starting with publication of the legal notice. Comments should be sent to one of the addresses listed below by **June 1, 1999**

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

Jodie Canfield, Elkhorn Coordinator
Townsend Ranger District
Helena National Forest
415 South Fron
Townsend, MT 59644
(406) 266-3425

Ron Spoon
Fisheries Biologist
Montana Fish, Wildlife and Parks
P.O. Box 1137
Townsend, MT 59644
(406) 266-4237

Other groups or agencies contacted or which may have overlapping jurisdiction: U.S.D.A. Forest Service - Helena National Forest, U.S.D.A. Forest Service, Beaverhead-Deerlodge National Forest, U.S.D.I., Bureau of Land Management, US Fish and Wildlife Service

Individuals or groups contributing to this EA: Archie Harper, Brad Shepard, Mike Korn, Bruce Rich, Steve Lewis, George Weldon, Len Walch

References

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Appendix A: - Use of fish toxicants

The Elkhorn Mountain Westslope Cutthroat Trout Recovery Project includes using fish toxicants to eradicate non-native fish populations in streams occupied by WCT. This project will employ the widely used fish toxicant, antimycin (Gresswell 1991; Stefferud et al. 1992; Meronek et al. 1996; Tiffan and Bergersen 1996).

Antimycin, an antibiotic that is EPA registered for removal of fish, is produced in cultures of bacteria of the genus Streptomyces (Lee et al. 1971). Antimycin kills fish by irreversibly blocking respiration at the cellular level. The commercially available formulation of antimycin, Fintrol (product information enclosed) will be applied at concentrations of 8 to 12 parts per billion (ppb).

At the present time, we lack definitive data on pH of the project streams. If (it is unlikely) any of the target streams have pH levels above 8.5, it may be necessary to do a second treatment using the fish toxicant rotenone. **Rotenone** is a chemical registered by the EPA for removal of fish, that is derived from the roots of certain South American plants and is widely used in fish removal projects (Meronek et al. 1996). A commercial formulation of rotenone will be used at a concentration of 0.25 to 1.0 part per million.

The exact concentrations of antimycin and rotenone to be used will be determined by doing bioassays under field conditions in the project area. Project personnel will collect all the fish that they can find that have been killed by the fish toxicants and bury them on site.While extremely toxic to fish at the proposed concentrations, **antimycin is not harmful to plants, most invertebrates, amphibians, reptiles, birds, or mammals, including humans, either from exposure to treated water, drinking of treated water, or ingestion of poisoned fish** (Walker et al. 1964; Schnick 1974a).

Certain invertebrates are sensitive to the proposed treatment levels of antimycin, including Cladocera and Copepoda (zooplankton), Amphipoda (scuds), and some species of mayflies and caddisflies. However, populations of these taxa have been found to be only temporarily diminished following treatment (Schnick 1974a; Jacobi and Deegan 1977). **Rotenone is also highly toxic to fish, with little or no toxic effects on non-target organisms at the proposed range of concentrations** (Cook and Moore 1969; Schnick 1974b; Houf and Campbell 1977; Engstom-Heg et al. 1978).

Antimycin breaks down rapidly in the environment by hydrolysis, exposure to sunlight, due to stream turbulence (Tiffan and Bergersen 1996), and in waters with high pH. After being added to a stream, a dose of antimycin loses much of its toxicity over a drop in stream elevation of about 200 feet (Tiffan and Bergersen 1996). Because of its rapid breakdown, it will be necessary to add antimycin to streams at drip stations located approximately every 100-120 feet of vertical drop along target streams or at locations separated by the distance that water in the stream flows in one half-hour. To measure the distance that stream water flows in one half-hour, a fluorescent dye, fluorescein sodium, will be used to produce a bright green color that can be followed along the stream channel. Fluorescein sodium is not toxic to fish at concentrations used in field applications; levels would have to be increased more than 1,000 times to be toxic to rainbow trout (Marking 1969).

Additionally, particularly if rotenone is used, the fish toxicants may be detoxified by adding **potassium permanganate (KMnO4)** at a concentration of one to four parts per million at detoxification stations. Potassium permanganate has long been used for various applications in fish culture including as a control for external parasites (Lay 1971), and for detoxification of antimycin (Marking and Bills 1975) and rotenone (Lawrence 1956). However, potassium permanganate itself is toxic to fish if concentrations are too high. The toxicity of potassium permanganate to fish is dependent on the particular chemistry of the water in

question. Surface waters have a potassium permanganate demand based on the amount of organic materials in the water. Successful use of potassium permanganate to detoxify antimycin and rotenone is based on balancing the amount of potassium permanganate with the natural chemical demand of the water and the chemical demand caused by antimycin or rotenone. To determine the optimal concentration (from one to four parts per million) of potassium permanganate, bioassays will be performed with trout and water from the target streams. These bioassays will be used to determine the amount of potassium permanganate needed to overcome the water's KMnO4 demand, nuetralize the fish toxicants, and not kill fish. When the optimal concentration has been determined, a detoxification station will be set up to dispense this concentration of potassium permanganate at the downstream end of the treatment sections. there is a potential for impacts on fish and invertegrates for a length of stream up to one mile below the detox station. These impacts may take polace because some time is required for potassium permanganate to mix in the water, as well as for the chemical oxidation of antimycin and rotenone to occur (Bramblett 1998)

FINTROL®
Fish toxicant

For partial or complete eradication of undesirable freshwater fish

IMPORTANT: USE PROTECTIVE GOGGLES AND PROTECTIVE GLOVES AT ALL TIMES WHEN MIXING, HANDLING, OR APPLYING FINTROL. Any contact of FINTROL with the eyes can cause *intense pain and irritation* immediately or within several hours following contact. Avoid contact of FINTROL with skin. If any contact occurs with eyes or skin, flush repeatedly with water immediately. Consult physician if discomfort occurs.

FINTROL-CONCENTRATE contains acetone. If swallowed, give 2 to 4 glasses of water to dilute acetone, induce vomiting, and consult physician. FINTROL-CONCENTRATE is flammable: keep away from heat and flame.

FINTROL-CONCENTRATE is designed for use in running waters, streams, and shallow waters. This liquid form of FINTROL may be applied to lakes and ponds by boat bailer method or spray equipment. Spray methods are useful at depths to 1 foot. Boat bailer and drip tubes, applied at the propeller wash, are used at other depths. Application from an airplane is *not* recommended.

Each can of FINTROL-CONCENTRATE [containing 240 cc. FINTROL-CONCENTRATE (solution 20%) and 240 cc. Diluent] will, after mixing, treat approximately 38 acre-feet of water at 1 p.p.b.

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Before applying FINTROL to either public or private waters, write to the Director of the State Fish and Game Department or Conservation Department for State and Federal regulations governing the use of fish toxicants in your area.

DESCRIPTION

The active ingredient of FINTROL is antimycin A. When absorbed through the gills of fish, antimycin A kills by interfering with the respiration of body cells. Antimycin A does not repel fish. This is an important advantage, particularly when running waters, bog lakes, and the epilimnion, or upper layer, of large lakes are treated. Fish make no attempt to escape contact with the toxicant by seeking to move into waters that are clear of it. FINTROL'S action is rapid and irreversible.

Sensitivity to FINTROL varies widely among fish species. Hence it may be employed to selectively destroy certain species, without affecting other species concurrently inhabiting the same body of water.

Sensitive
Gizzard, shad, trouts, pikes, carp, minnows, suckers, brook stickleback, white bass, sunfishes, perches, freshwater drum, sculpins.

Least Sensitive
Shortnose gar, bowfin, goldfish, catfish.

FINTROL also may be used to selectively destroy certain age groups of species; younger fish are more sensitive to FINTROL.

Providing the concentration is correctly estimated, FINTROL can be used effectively at any time of year in either cold, warm, soft, hard, acid, alkaline, clear or turbid (muddy) waters. (See TABLE 1 and instruction for bioassay.)

FINTROL does not impart detectable taste or odor to treated waters. In the usual, recommended concentrations it causes no apparent harm to aquatic plants, insects, or bottom fauna. Since FINTROL'S active ingredient degrades rapidly, the reclaimed waters may be restocked soon after treatment. (**See HOW TO DETERMINE WHEN TREATED WATER MAY BE RESTOCKED.**) There is very little interruption in availability of the waters for recreational, agricultural, industrial, or other purpose.

USES

FINTROL is used to cull undesirable species of fish from freshwater lakes, ponds, and streams. It can be used to eliminate all fish from a body of water (complete kill). Or, it can be used to remove only certain fish species or size groups from mixed populations (selective kill).

A **complete kill** may be achieved with a concentration of anywhere from 5 to 25 p.p.b. of active ingredient. (**See HOW TO DETERMINE THE MOST EFFECTIVE CONCENTRATION.**) FINTROL is particularly advantageous for complete kills because it detoxifies so rapidly the pond can usually be restocked in about a week, or as soon as caged fish survive 48 hours' exposure to the treated waters.

Under optimal circumstances, in ponds managed for sports fishing, **selective kills** may be achieved at concentrations as low as 0.5 to 1.0 p.p.b. However, because these concentrations are extremely low, there is no rule of thumb that can be relied upon to determine them accurately. A BIOASSAY IS ALWAYS REQUIRED TO PINPOINT THE OPTIMAL CONCENTRATION FOR SELECTIVE KILLS. (Literature describing this procedure is available upon request.)

A **selective kill** has these advantages: It can be made without interrupting sport fishing for more than a week or so, and fishing may be gradually improved without restocking. In the past, when bluegill, minnows, or green sunfish dominated a pond managed for bass, the usual solution to the problem was the total removal of all the fish with a fish toxicant. This meant restocking and little or no fishing for one or two years. Now — with FINTROL — this is no longer necessary. Low concentrations of FINTROL will affect small bluegill, green sunfish, and minnows primarily. Only a few of the very small bass will succumb. The bulk of the adult bluegill and green sunfish will not be affected. Thus FINTROL helps to bring about a balanced relationship between the bass and bluegill populations. This improves fishing without interrupting it for any appreciable length of time.

In **catfish farming** FINTROL can be used to *selectively eliminate* the trash fish (scale fish) that commonly reduce the yields and increase the costs of the commercial catfish farmer. It is possible to do this with FINTROL because concentrations that will eliminate scale fish generally will not harm adult catfish. The scale fish most often encountered by the catfish farmer will succumb to anywhere from 5 to 10 p.p.b. of active ingredient (See TABLE 1) whereas, under ordinary circumstances, it takes in excess of 20 p.p.b. to kill catfish. [Caution should be exercised during "stress conditions" of unusually high water temperature and reduced oxygen content when the sensitivity of fishes to chemicals may increase.]

HOW TO SELECT THE APPROPRIATE FORMULATION

The nature of the water to be treated (its depth and rate of flow) and the character of the surrounding land are factors to be taken into consideration when determining the formulation of FINTROL to employ in a given situation.

HOW TO DETERMINE THE MOST EFFECTIVE CONCENTRATION

For complete kills and also,
for removal of scale fish from catfish ponds.
The concentration of antimycin A required to kill one or more species of fish in any given body of water depends upon: 1) the sensitivity of the species to be eradicated, and 2) the chemical and physical properties of the water at the time of application of the toxicant; the pH and the temperature of the water being the most important of these chemical and physical factors under ordinary circumstances. Therefore, to determine what concentration of antimycin A will be required to kill the undesirable fish in your pond or lake:

1) identify the species to be eradicated,
2) determine the pH and average water temperature by measuring at various sites and depths,
3) refer to TABLE 1 for approximate concentrations,
4) conduct a bioassay to pinpoint the optimal concentration.

TABLE 1 provides a rough estimate of the concentrations required for **a complete kill** under various environmental conditions. However, since water chemistry is subject to sudden alteration by many variable, and often unpredictable factors (pollution, heavy bloom, weather, drawdown, etc.) it should be realized that such changes may affect the performance of the toxicant. For this reason, measurements of pH and water temperature should always be taken as close to the time of treatment as is feasible.

TABLE I — FOR ROUGH ESTIMATION OF CONCENTRATIONS* OF FINTROL (ANTIMYCIN A) NEEDED FOR COMPLETE† ERADICATION OF DIFFERENT FISH SPECIES, UNDER VARIOUS COMBINATION OF WATER TEMPERATURE AND WATER pH

TARGET SPECIES**	SENSITIVITY OF TARGET SPECIES TO FINTROL (in p.p.b. of active ingredient)	EFFECTIVE CONCENTRATION OF FINTROL* (in p.p.b. of active ingredient)			
		When pH is 8.5 or less		When pH is 8.5 or more	
		water temperature above 60°F.	water temperature below 60°F.	water temperature above 60°F.	water temperature below 60°F.
col. 1	col. 2	col. 3	col. 4	col. 5	col. 6
gizzard shad trouts pikes carp minnows suckers brook stickleback white bass sunfishes perches freshwater drum sculpins	5-10	5	7.5	7.5	10
shortnose gar bowfin goldfish catfish	15-25	15	20	20	25

* The concentration level suggested by this table should be confirmed by an on-site bioassay.

† This table is applicable only when a *complete* kill is desired. Do not use it for a selective kill. (See the following section.)

**Fish nomenclature according to American Fisheries Society.

Note (columns 1 and 2) that the sensitivity of the target species determines the concentration range. To eradicate sensitive species, it is recommended that the appropriate formulation of FINTROL be applied so that the body of water will have a concentration of from 5 to 10 p.p.b. of antimycin A, depending upon variation in pH and water temperature. For more tolerant species, higher concentrations are recommended. Laboratory studies indicate that less sensitive fish will succumb at concentrations of from 15 to 25 p.p.b. of antimycin A, depending upon variations in pH and water temperature.

Columns 3 to 6 show how to adjust for pH and water temperature. Note that, in general, the lower the pH, the less FINTROL required. The higher the water temperature, the less FINTROL required. The ideal situation for a complete kill would combine a highly sensitive species, low pH and high water temperature.

For selective kills in ponds managed for sports fishing

The only way to determine the concentration of FINTROL needed for a **selective kill** is to perform a bioassay. This involves subjecting both the target and nontarget fish to several concentrations of FINTROL to determine the minimum lethal dose. (A description of the bioassay procedure is available upon request.)

HOW TO CALCULATE THE AMOUNT OF FINTROL TO BE ADDED TO A BODY OF WATER TO OBTAIN A GIVEN CONCENTRATION

To calculate the amount of FINTROL to be added to a body of water for eradication of undesired species, the following steps should be taken:

Determine the volume of water to be treated in acre-feet. This can be arrived at by multiplying the surface area in acres by the average depth in feet.

Determine the concentration to be used.

Multiply the number of acre-feet to be treated by the value given opposite the desired concentration in the table for the formulation to be used. (See Tables.)

TABLE FOR RAPID ESTIMATION OF FINTROL-CONCENTRATE REQUIREMENTS

Desired Concentration (p.p.b. active ingredient)	Amount of FINTROL-CONCENTRATE per acre-foot†	
	cc*	oz. (approx.)
1 p.p.b.	12.3	½
2 p.p.b.	24.6	¾
3 p.p.b.	36.9	1¼
4 p.p.b.	49.2	1½
5 p.p.b.	61.5	2
6 p.p.b.	73.8	2½
7 p.p.b.	86.1	2¾
8 p.p.b.	98.4	3¼
9 p.p.b.	110.7	3¾
10 p.p.b.	123.0	4

*Obtained by multiplying 12.3 cc. by the p.p.b.

Note: 1 measuring teaspoon = 5 cc.; 1 measuring tablespoon = 15 cc; ¼ standard measuring cup = 60 cc.; ½ standard measuring cup = 120 cc.; 1 standard measuring cup = 240 cc.

Sample calculation:

To treat 75 acre-feet at 3 p.p.b., use:
36.9 cc. x 75 = 2,767 cc. of FINTROL-CONCENTRATE
or
1¼ fl. oz. x 75 = 93¾ fl. oz. of FINTROL-CONCENTRATE.

METHODS OF APPLICATION

IMPORTANT: DURING APPLICATION OF FINTROL, ALL PERSONS IN THE IMMEDIATE VICINITY SHOULD WEAR PROTECTIVE GOGGLES AND PROTECTIVE GLOVES.

Liquid formulation: Directions for mixing: Add the Diluent [blue label] to the FINTROL-CONCENTRATE (solution 20%) [green label] in the oversize mixing container. Cap tightly and invert 2 to 3 times to mix thoroughly. Further dilute with AT LEAST five (5) gallons of water to insure that the acetone contained in FINTROL-CONCENTRATE will not affect rubber parts on any equipment that might be used to apply it. After water has been added, apply within eight (8) hours. [Note: The solution obtained by mixing the Diluent with FINTROL-CONCENTRATE (solution 20%) retains potency for up to seven (7) days. But once water has been added to this solution, it must be used within eight (8) hours to ensure potency.]

After appropriate dilution with water, the liquid formulation of FINTROL can be applied to lakes and ponds by the boat bailer method or spray equipment. Spray methods are useful at depths to one foot. Boat bailer and drip tubes when applied at the propeller wash are useful at greater depths. Pinpoint applications to shoal areas and small, isolated ponds can readily be made with back-pack sprayers. (See CAUTION on use of PROTECTIVE GOGGLES AND PROTECTIVE GLOVES.)

In streams, FINTROL-CONCENTRATE is most often applied through drip stations established to meter the toxicant at a precalculated rate. Information on the use of such equipment may be obtained from state and/or federal agencies, experienced in stream treatment.

It is recommended that all applications of FINTROL be made at daybreak or as soon as there is enough light to work by.

PRECAUTIONS

USE PROTECTIVE GOGGLES AND PROTECTIVE GLOVES at all times when mixing, handling, or applying FINTROL. Any contact of FINTROL with the eyes can cause *intense pain and irritation* immediately or within several hours following contact. Avoid contact of FINTROL with skin. If any contact occurs with eyes or skin, flush repeatedly with water immediately. Consult physician if discomfort occurs. FINTROL-CONCENTRATE contains acetone. If swallowed, give 2 to 4 glasses of water to dilute acetone, induce vomiting, and consult physician. Should inhalation of the vapors of FINTROL-CONCENTRATE cause nausea, fresh air will dispel it.

FINTROL may be fatal or harmful if swallowed.

Keep FINTROL out of reach of children, pets, livestock, and wildlife. Thoroughly rinse all containers prior to disposal. Pending the conclusion of studies now in progress, fish killed with antimycin A should not be consumed by man or animals. Treated waters must not be used for drinking by man or animals, or for crop irrigation, until fingerling rainbow trout or fingerling bluegills survive 48 hours' exposure in livecars in the treated waters.

Leftover portions of diluted liquid formulation retain potency for up to seven (7) days. But once water has been added to FINTROL-CONCENTRATE, it must be used within eight (8) hours to ensure potency.

Due to its acetone component, FINTROL-CONCENTRATE is flammable; keep away from heat and flame.

HOW TO DETERMINE WHEN TREATED WATER MAY BE RESTOCKED

Since antimycin A degrades rapidly following application, waters can usually be restocked about one week following treatment with FINTROL. Place livecars containing a sensitive species of fish in the treated water. It is recommended that these fish be fingerling rainbow trout or fingerling bluegills if the water temperature is between 35° and 68°F. When the water temperature exceeds 68°F, only fingerling bluegills should be used. If the fish survive for 48 hours, the water may be restocked.

HOW TO DETOXIFY FINTROL WITH POTASSIUM PERMANGANATE ($KMnO_4$)

If it should be necessary to detoxify FINTROL in the outflow of a pond to prevent killing fish downstream, apply potassium permanganate ($KMnO_4$) at 1 part per million (1 p.p.m.) to the outflow. Drip systems of hose-and-clamp or carburetor types can be employed to continuously dispense a solution of potassium permanganate into the water at the discharge outlet.

To evaluate the effectiveness of the detoxification process, place livecars containing fingerling rainbow trout or fingerling bluegills approximately 100 yards downstream from the site of $KMnO_4$ introduction. The water is considered detoxified if the fish survive for at least 48 hours in the livecar.

To detoxify FINTROL-treated streams, apply $KMnO_4$ at 1 p.p.m. at detoxification stations. Continue the application of $KMnO_4$ until all FINTROL-treated water has passed the station. The water may be considered detoxified when fingerling rainbow trout or fingerling bluegills survive for at least 48 hours in livecars placed 100 yards downstream from the site of potassium permanganate ($KMnO_4$) introduction.

Special Instructions: Prior to the use of a fish toxicant in either public or private waters, the Director of the State Fish and Game Department or Conservation Department must be contacted to determine whether a permit is required. Such products must be used by or under the technical supervision of personnel of state and federal fish and game agencies, trained in fisheries management, who will provide any special instructions applicable to the particular geographical area.

Appendix B: Program of Work 1997-2010

The program of work varies significantly between Alternatives 2 and 3. However, in either alternative, there are similar types of activities that will be implemented on a given stream. An example of the steps necessary to complete typical projects are outlined in Tables 4, 5, and 6. Tables 7 , 8, and 9 outline the actual programs, for Alternatives 2 and 3, respectively.

Table 4. Example of the program for an individual stream with existing WCT and EBT.

Year	Activity
1	Barrier installation
1*	removal of EBT by electrofishing
2 and 3	Electrofish to salvage EBT and remove WCT to a suitable refuge; treat stream with toxicant
4	Monitor WCT population
5	No activity
6	No activity
7	Final Assessment

* May be used for more than one year to reduce brook trout populations and allow for WCT population to attain a greater density prior to using a fish toxicant

Table 5. Example of the program for an individual barren stream introduction project

Year	Activity
1	Stream, amphibian, and invertebrate surveys
2, 3, 4	egg collection from donor stream and incubation in recipient stream
5	Monitor WCT population
6-7	No activity
8	Final Assessment

Table 6. Example of an introduction program for an individual stream with existing EBT.

Year	Activity
1	Surveys and barrier installation if needed
2-3	removal of EBT with fish toxicant
4,5,6	egg collection from donor stream and incubation in recipient stream
7	Monitor WCT population
8,9	No activity
10	Final Assessment

Table 7. Activities and locations of project work associated with Alternatives 2 and 3

Management Activity	Alternative 2	Alternative 3
Barrier Construction	Staubach Upper McClellan*	Staubach Mid-McClellan** South Fk. Warm Springs North Fork Indian Creek
Non-native Removal	Muskrat Staubach Upper McClellan	Muskrat Staubach Mid-McClellan & associated tribs South Fk. Warm Springs Upper Crow complex*** North Fork Indian Creek East Fork Dry Creek
Introduction of WCT	Eureka Creek (from Hall source)	Eureka Creek (Barren) Whitehorse Creek (Barren) South Fk. Warm Springs North Fork Indian Creek East Fork Dry Creek Upper Crow Complex
Monitoring and Assessment Project Work	Muskrat (post project) Staubach (post project) Upper McClellan (pre and post) Eureka (pre and post)	Muskrat (post project) Staubach (post project) Mid- McClellan (pre and post) Eureka (pre and post) Whitehorse Creek (Barren) South Fk. Warm Springs North Fork Indian Creek East Fork Dry Creek Upper Crow Complex
Monitoring of barriers	Prickly Pear (natural barrier) Dutchman (natural barrier)	In conjunction with other monitoring, barriers will be checked in all existing WCT streams
Monitoring of genetic donor populations (evaluate impact of using these fish to donate eggs)	Hall	Prickly Pear Dutchman Hall

* At the point of the confluence with Teepee and McClellan
** Forest Boundary near Crystal Creek confluence with McClellan
***Above Crow Creek Falls

Table 8. Program of Work for Alternative 2

Stream name Year	Muskrat	Staubach	upper McClellan	Eureka Creek	Hall Creek (genetic donor)
1999	electrofish removal EBT	barrier installation; electrofish removal EBT	NA	NA	NA
2000	remove WCT; apply fish toxicant	remove WCT; apply fish toxicant	Surveys	NA	NA
2001	remove WCT; apply fish toxicant	remove WCT; apply fish toxicant	barrier installation; electrofish removal EBT	Survey streams	monitor WCT
2002	Monitor WCT population	Monitor WCT population	remove WCT; apply fish toxicant	Egg collection from Hall Creek; incubation in Eureka	monitor WCT
2003	NA	NA	remove WCT; apply fish toxicant	Egg collection from Hall Creek; incubation in Eureka	monitor WCT
2004	NA	NA	Monitor WCT population	Egg collection from Hall Creek; incubation in Eureka	monitor WCT
2005	Final Assessment	Final Assessment	NA	Monitor WCT populatino	monitor WCT
2006	NA	NA	NA	NA	NA
2007	NA	NA	Final Assessment	NA	NA
2008	NA	NA		Final Assessment	monitor WCT

Barrier inspections done every other year on existing WCT populations

Table 9. Program of Work for Alternative 3

	Muskrat	Staubach	McClellan	Eureka Creek	South Fork Warm Springs Creek	East Fork Dry Creek	North Fork Indian Creek	Whitehorse Creek	Upper Crow Complex	Prickly Pear, Dutchman, Hall and other genetic donors
1999	electrofish removal EBT	EA/ barrier installation; electrofish removal EBT	NA	NA	NA	NA	NA	NA	NA	monitor WCT
2000	remove WCT; apply fish toxicant	remove WCT; apply fish toxicant	Surveys/EA	NA	NA	NA	NA	NA	NA	monitor WCT
2001	remove WCT; apply fish toxicant	remove WCT; apply fish toxicant	barrier installation; electrofish removal EBT	Survey/EA	Survey/EA	NA	NA	NA	NA	monitor WCT
2002	Monitor WCT population	Monitor WCT population	remove WCT; apply fish toxicant	Egg collection from Hall Creek; incubation in Eureka	barrier installation;	NA	NA	Survey/EA	NA	monitor WCT
2003	NA	NA	remove WCT; apply fish toxicant	eggs	apply fish toxicant	apply fish toxicant	NA	Egg collection from nearest neighbor & incubation	Survey	monitor WCT
2004	NA	NA	Monitor WCT population	eggs	apply fish toxicant	apply fish toxicant	apply fish toxicant	eggs	Survey/EA	monitor WCT
2005	NA	NA	NA	Monitor WCT population	Monitor	Monitor	apply fish toxicant	eggs	Survey/EA	monitor WCT
2006	Final Assessment	Final Assessment	NA	NA	Egg collection from nearest neighbor & incubation	Egg collection from nearest neighbor & incubation	Monitor	Monitor WCT population	apply fish toxicant	monitor WCT
2007	NA	NA	NA	NA	eggs	eggs	Eggs from nearest neighbor	NA	apply fish toxicant	monitor WCT
2008	NA	NA	Final Assessment	Final Assessment	eggs	eggs	Eggs from nearest neighbor	NA	apply fish toxicant	monitor WCT
2009	NA	NA	NA	NA	Monitor/ Final assessment in 2012	Monitor/ Final assessment in 2012	Eggs; monitor in 2010 and final assessment in 2013	Final Assessment	Monitor/ introduce WCT in 2010-2012, monitor and final assessment in 2016	monitor WCT

MONITORING:

The Elkhorn work is somewhat unique in Montana because it takes a geographic approach to the management and recovery of WCT, and attempts to use a variety of tools to secure a valuable genetic reserve. These techniques are relatively new to Montana citizens and anglers, and we believe it is very important that monitoring of this work is a very high priority. Monitoring will assess success and determine future management options. After 10 years of implementation and monitoring, we hope to answer the following issues/questions relative to managing WCT in the Elkhorn Mountains and elsewhere.

- **did the program have an effect on existing land management activities?**
- **will the recovery strategy be adequate if the WCT is listed under ESA?**
- **can we get 100% removal of eastern brook trout?**
- **can we build barriers with a low risk of failure?**
- **can we expand populations of WCT by introduction into barren waters?**
- **will this program increase or decrease fishing opportunities**
- **can we define a viable population?**
- **is it socially feasible to replace brook trout with WCT?**
- **what is the status of our original populations at the end of the recovery program?**
- **what additional data or research is needed?**