STATE OF NEVADA
DEPARTMENT OF WILDLIFE

LAHONTAN CUTTHROAT TROUT

SPECIES MANAGEMENT PLAN

FOR THE UPPER HUMBOLDT RIVER

DRAINAGE BASIN

Prepared by

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SPECIES MANAGEMENT PLAN

December 2004

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FOR THE UPPER HUMBOLDT RIVER DRAINAGE BASIN

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EXECUTIVE SUMMARY

This species management plan is an update of the Nevada Department of Wildlife (NDOW) Lahontan Cutthroat Trout Fishery Management Plan for the Humboldt River Drainage Basin (1983), and a supplement to the U.S. Fish and Wildlife Service (USFWS) Recovery Plan for the Lahontan Cutthroat Trout (1995). The Lahontan cutthroat trout (LCT) is a federally listed threatened species native to the Lahontan basin. Based on the most recent population sampling in the Upper Humboldt Basin, LCT occupy 71 streams and an estimated 179 miles of habitat. Historically, LCT may have occurred in as much as 2,210 miles of habitat in the Upper Humboldt Basin during wet cycles. The two primary causes of this population decline have been the degradation of aquatic habitat and the introduction of non-native trout.

The Upper Humboldt River Drainage Basin is located in northeastern Nevada within the boundaries of the Eastern Region and the northwest portion of the Southern Region of the NDOW. This plan covers that portion of the Humboldt River Basin located in the counties of Elko, Eureka, Lander, and northern Nye. In the USFWS LCT Recovery Plan, this portion of the Upper Humboldt River Basin population segment consisted of 90 current or recently existing populations of LCT (excluding three populations in Churchill County), and nine potential sites. Of the current or recently existing populations, eight are located in interior Nevada basins, and the rest are located in subbasins within the Humboldt River Basin. All potential sites are also located within these subbasins. The objective of the USFWS LCT Recovery Plan was to maintain and enhance the current or recently existing populations in the Marys River subbasin (17 populations), North Fork Humboldt River subbasin (12 populations), East Humboldt River Area (6 populations), South Fork Humboldt River subbasin (20 populations), Maggie Creek subbasin (7 populations), Rock Creek subbasin (6 populations), Reese River subbasin (9 populations), South Fork Little Humboldt River Area (4 populations), Pine Creek Subbasin (2 populations), and the Interior Nevada Basins (7 populations).

In accordance with the USFWS LCT Recovery Plan, LCT population segments (i.e. Humboldt River Basin) will be considered for delisting once management is instituted that enhances and protects habitat required to sustain appropriate numbers of viable self-sustaining populations.

The objectives of this species management plan are to recommend actions that will improve the status of LCT in the Upper Humboldt River basin to a point where these populations will no longer require protection under the Endangered Species Act, and direct on-going conservation actions for populations after delisting. Priority recovery actions needed to effect recovery are presented and discussed in this plan. Primary emphasis is placed on recovery actions that are the responsibility of the NDOW. As the recovery objectives for maintenance of populations by basin segments are met, the NDOW will petition the USFWS for delisting of the species in that portion of its range.

INTRODUCTION

The Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) is a unique subspecies of the cutthroat trout complex endemic to the Lahontan basin of Nevada, Oregon and California. It was listed as an endangered species in 1970 by the USFWS and subsequently reclassified as a threatened species in 1975 in order to facilitate management actions and allow regulated angling. In 1983, the NDOW prepared the Lahontan Cutthroat Trout Fishery Management Plan for the Humboldt River Drainage Basin to summarize data on LCT populations and provide management direction and guidelines for the protection and enhancement of the trout and its habitat. In 1995, the USFWS completed the Recovery Plan for the Lahontan Cutthroat Trout to summarize data on LCT populations in Nevada, Oregon and California, and provide recommendations on actions to maintain and enhance existing populations, with the ultimate objective of delisting the species.

The Lahontan Cutthroat Trout Species Management Plan for the Upper Humboldt River Drainage Basin (hereafter referred to as the Upper Humboldt Plan) is intended as an update to the NDOW Lahontan Cutthroat Trout Fishery Management Plan for the Humboldt River Drainage Basin (1983), and as a supplement to the USFWS Recovery Plan for the Lahontan Cutthroat Trout (1995). The Upper Humboldt Plan will include the Humboldt River Basin population segment of LCT as delineated in the USFWS LCT Recovery Plan, excluding the North Fork of the Little Humboldt River and its tributaries, and Rock Creek in the Sonoma Range. It will also include a number of introduced populations in central Nevada (Map 1). The attached maps reflect general locations and drainage patterns of streams referenced in the Upper Humboldt Plan. Current LCT distribution maps are contained in stream files at NDOW offices.

Through State Statute and State of Nevada Board of Wildlife Commissioners Policy, the NDOW has primary responsibility for management of LCT including, but not limited to, managing angler harvest, monitoring populations, making reintroductions, and conducting eradication projects. Species management planning is also a primary responsibility of NDOW as established in Commission Policy Number P-33 (July 1999) and NDOW Fisheries Bureau Program and Procedure for Fisheries and Species Management Planning (December 1999). In terms of habitat management, the NDOW will continue to act in an advisory role to land management agencies and private land managers. The Upper Humboldt Plan will be the guide for management actions to be taken by the NDOW, in accordance with its primary responsibilities, to achieve the recovery and delisting of the LCT. The NDOW will participate in cooperative efforts with the USFWS, all land management agencies, other state agencies, and willing private land owners and local governments that are working toward the recovery of LCT. A "Distinct Population Segment Recovery Team" (DPS Team) made up of local representatives of agencies has been established to identify and prioritize issues, provide recommendations and develop specific plans on a local basis. The DPS Team will also develop a forum for local public review and input on recovery activities and priorities as recommended by the DPS Team.

The Upper Humboldt Plan consists of five sections: Current Status, Recovery Objectives, Recovery Actions, Recovery Action Priorities by Subbasin, and Implementation Schedule. The Current Status section provides the latest information and data on LCT populations by subbasin. The Recovery Objectives section deals with the objectives delineated in the USFWS LCT Recovery Plan. As the Upper Humboldt Plan coordinates closely with the USFWS LCT Recovery Plan, direct quotes from the USFWS LCT Recovery Plan, Addendums, and Memorandums of Agreement will be in bold. The Recovery Actions section defines the management actions or options needed to reintroduce, protect or enhance LCT populations, with primary emphasis given to NDOW's responsibilities. The Recovery Action Priorities by Subbasin provides the management actions recommended for each stream, and the Implementation Schedule gives an estimated time frame and priority level for future management actions.

AGENCY RESPONSIBILITIES

Due to the varied land status of the proposed recovery streams, coordination and cooperation between Federal and State agencies will be needed to accomplish recovery. To formalize this commitment, a Memorandum of Agreement (MOA) between the USFWS, NDOW, U.S. Forest Service (USFS), and Bureau of Land Management (BLM) was signed on May 23, 1996, to provide specific direction for LCT recovery. The basic agency responsibilities and obligations outlined in this agreement are as follows:

The USFWS is responsible for developing recovery plans identifying measures proposed for the recovery of species and subspecies listed as endangered or threatened under the authority of the Endangered Species Act of 1973. The USFWS shall coordinate activities with the agencies on an annual basis to determine progress towards achieving recovery objectives described in the plan, and identify activities proposed for the upcoming year.

The USFS is required by law to practice multiple-use land management to provide for sustained production of forest products, grazing, fish, wildlife, water, and recreation and to protect and enhance threatened and endangered, and sensitive species and their habitats. The USFS shall implement activities to recover and maintain riparian habitat to achieve proper functioning condition and desired future condition to enhance the opportunity for LCT recovery. The USFS will conduct implementation, effectiveness, and validation monitoring to determine achievement of objectives.

The BLM is required by law to protect and enhance threatened and endangered, and sensitive species and their habitats. In addition, the Federal Land Policy and Management Act of 1976 provides for multiple-use and protection of natural resources through habitat inventory and management of public lands, and habitat management for fish and wildlife. The BLM shall implement activities to recover and maintain riparian habitat to achieve proper functioning condition and desired future condition to enhance the opportunity for LCT recovery. The BLM will conduct implementation, effectiveness, and validation monitoring to determine achievement of objectives.

The NDOW is required by statutory regulation and Commission policy to preserve, protect, manage, and restore fish and wildlife within the State of Nevada which contributes to the aesthetic, recreational, and economic values of the state. NDOW shall be responsible for management of LCT populations including; management of angler harvest, monitoring population status and trend, making reintroductions, and conducting fish eradication projects as necessary to achieve objectives of the plan.

Furthermore, the State of Nevada Board of Wildlife Commissioners passed Commission Policy Number P-31 (March 1996) to provide for the preservation, protection, management, and restoration of the LCT. Excerpts pertinent to the Upper Humboldt Plan are as follows:

1. The Lahontan Cutthroat Trout Recovery Plan approved in January, 1995 by the USFWS will be used as the guideline for the NDOW's species management planning and implementation with the objective of recovery and delisting the species as rapidly as biologically possible.

2. Distinguishable races of LCT will be managed separately within the major drainage basins of historic Lake Lahontan. The three basin population segments include the Western Lahontan basin population segment, Northwestern Lahontan basin population segment and the Humboldt River basin population segment.

3. In order to accomplish the recovery objectives, the Division will participate in cooperative efforts with the USFWS, all land management agencies, other state agencies, willing private land owners and local governments that are working toward the recovery of LCT and their habitat.

4. Stream habitat restoration and management is a necessity on many waters before reintroductions can take place. On some streams, competing nonnative trout will have to be controlled or eliminated and/or physical barriers constructed to prevent competition or hybridization with LCT.

5. Currently occupied and potential habitats as identified in the Lahontan Cutthroat Trout Recovery Plan are to be dedicated to LCT recovery efforts. No competing salmonids will be stocked in those waters.

6. Where deemed necessary to assist in the recovery of the species, specific waters or specific areas within individual waters may be closed to angling by the Wildlife Commission. In most cases, sportfishing for LCT has no negative impact on the recovery program.

10. The NDOW will maintain brood stocks of pure strain LCT both for use as recreational sport fish and, if needed, recovery stocks of selected races of cutthroat for reintroduction into recovery streams.

11. As the recovery objectives for maintenance of populations by basin segments are met, the NDOW will petition the USFWS for delisting of the species in that portion of its range.

CURRENT STATUS

Historically, LCT may have inhabited as much as 2,210 miles of stream habitat in the major subbasins of the Humboldt River during wet cycles (Coffin 1983). Early emigrant journals documented LCT in nearly all the major subbasins and occasionally as far as the Humboldt Sink during wet years. The major impacts to LCT populations in the Humboldt Basin have come as a result of loss of habitat and displacement and hybridization by introduced trout species. Angler use on LCT streams in Nevada has historically been very low. LCT streams with high angler use are generally characterized by having non-native trout species at more accessible lower elevations, with LCT occupying the less accessible headwater areas.

Stream surveys in the late 1970's and early 1980's had identified 60 LCT streams with 227 miles of occupied habitat in the Upper Humboldt Basin. An additional 12 streams had been identified as potentially occupied by LCT, but had not been surveyed. The most current stream survey data has identified a total of 71 streams with approximately 179 miles of LCT occupied habitat. Several of the subbasins have interconnected subpopulations (metapopulations), which are less vulnerable to extinction. It is estimated that the streams in these subbasins, including potential recovery streams (Appendix E, USFWS LCT Recovery Plan), have a total of nearly 700 miles of potential LCT habitat. As opportunities arise, other streams within the Upper Humboldt Basin may be included as potential recovery waters. LCT populations introduced into interior Nevada basins occupy an additional seven streams and 24 miles habitat. Appendix A details the most current LCT status (2003) for all streams by subbasin in the Upper Humboldt Plan.

The following is a general discussion of the current status of LCT populations and habitat by subbasin. LCT population surveys are point-in-time measurements and give a general indication of population status. Statements regarding population status may not necessarily be representative of population trend. In terms of habitat, different survey methodologies have been utilized that rate the condition of aquatic and riparian habitats. Unless otherwise noted, statements regarding habitat conditions and ratings relate to both aquatic and riparian habitat.

MARYS RIVER SUBBASIN

The Marys River Subbasin has the highest potential miles (180) and the greatest metapopulation potential of all subbasins in the Humboldt River Basin population segment (Map 2). The most recent fish population surveys have found LCT populations in 14 streams occupying an estimated 36 miles of habitat. Several of these streams are small tributaries that have been identified as important spring spawning areas. Surveys conducted in the late 1990’s found the amount of LCT occupied habitat to have nearly doubled from what had been found in the late 1980’s. The most recent surveys (2000-2003) have documented drought related declines in both LCT numbers and amount of

occupied habitat in a majority of the subbasin, and densities remain low in the few streams with more stable populations.

The most recent cooperative stream survey project habitat surveys in the Marys River Subbasin were conducted between 1997 and 2002. Attachment 1 lists the most current status of habitat for LCT recovery streams. Habitat condition on BLM administered portions of streams in the Marys River Subbasin have primarily been rated fair to good, with an upward trend (Evans et al. 2003). The primary limiting factors in most of these streams is a lack of over-summer and over-winter habitat in the form of high quality pools. Unfortunately the formation of high quality pools through beaver activity, changes in channel morphology, or from large woody debris can be a long-term proposition. In 1998 and 2002, General Aquatic Wildlife System (GAWS) habitat surveys were conducted on Currant Creek, a potential LCT recovery stream, and lower T (Anderson) Creek. Aquatic habitat conditions on a majority of both streams were found to range from good to excellent, with the primary limiting factors being a poor pool:riffle ratio, and a lack of quality pools and desirable substrate.

Three streams within this subbasin are known to have populations of non-native trout. In 1974, a brook trout (*Salvelinus fontinalis*) population averaging 1,126 fish per mile was found in Wildcat Creek near the confluence with T (Anderson) Creek. More recent surveys (1999-2001) found a strong population of brook trout in lower T Creek, below the Wildcat Creek confluence, and a small population of brook trout in the middle portion of the Marys River. Currant Creek was surveyed in 1978 and found to have brook trout, rainbow trout (*Oncorhynchus mykiss*), hybrid cutthroat-rainbow, and LCT. Brook trout occupied 6 miles of stream, rainbow trout and hybrids 5.5 miles, and LCT 1.5 miles. Currant Creek was resurveyed in 1998 and found to contain only brook trout, rainbow trout, and possible hybrid cutthroat-rainbow. In 1997, a single brook trout was discovered in Marys River Basin Creek, a headwater tributary to the Marys River. This area was surveyed again in 1998, with no brook trout being found.

Angling pressure in the Marys River Subbasin has historically been light. This is most likely due more to the difficult access than any other factor. NDOW 10 percent angler questionnaire data from 1993-2002 for LCT recovery streams in the Upper Humboldt Basin is summarized in Appendix B. Over this 10-year period in the Marys River Subbasin, only four of the 17 recovery streams had reported angler use. It is unlikely that the other 13 streams have not been fished in the past 10 years, but the pressure is obviously very light. The Marys River proper has reportedly had the highest angler use at an average of 148 angler days per year. From March 1, 1998 to March 1, 2002, restrictive regulations on LCT harvest were put in place on the Marys River and tributary streams. During this period, spot electroshocking data on the mainstem Marys River from the Orange Bridge to the wilderness boundary showed that the LCT population had actually decreased.

Appendix C summarizes the results of all genetic evaluations on LCT populations in the Upper Humboldt Basin. Genetic evaluations have been performed on three populations

within the Marys River Subbasin. Marys River and T Creek were found to have pure LCT in 1979. A sample taken in 1980 from the Currant Creek population was found to contain clear evidence of hybrid cutthroat-rainbow trout (Gall and Loudenslager 1981). Another sample taken from Currant Creek in 1998 was found to contain hybrids and pure LCT (Peacock 2003). This population is one of only four populations in the Upper Humboldt Basin that have been found to contain hybrid cutthroat-rainbow trout.

NORTH FORK HUMBOLDT RIVER SUBBASIN

The North Fork Humboldt River Subbasin has a total of six streams identified with LCT populations and an estimated 14.5 miles of occupied habitat. Approximately 112 miles of potential LCT habitat exists in the subbasin (Map 3). Metapopulation potential is somewhat limited as most streams are only connected during normal to wet water years. Recent (1997-2003) surveys have documented LCT populations in Foreman, Gance, Warm, Road Canyon, and California Creeks. The North Fork Humboldt River above Peterson Creek has shown a stable LCT population from 1988 through 1999 (JBR Consultants Group 1996, Chadwick Ecological Consultants, Inc. 2000). In 1997, Winters Creek was found to have intermittent flow and only young-of-year LCT, and no LCT were found in Mahala Creek (2000) or Jim Creek (2002). In 1998 and 1999, no LCT were found in Dorsey Creek, Pie Creek, and the North Fork Humboldt River below State Route 225.

From 1991-2002, habitat surveys were conducted on a majority of the streams in the North Fork Humboldt River Subbasin. In 1991, habitat conditions on the BLM administered portions of the North Fork Humboldt River were found to be variable. Riparian conditions were rated as fair to good with an upward trend in exclosures and riparian pastures, but were found to be poor with a downward trend in unfenced areas. The riparian habitat of the USFS portion was found to be in good condition (White Horse Associates 1992). The BLM administered portions of East Fork Beaver Creek, West Fork Beaver Creek, and Dorsey Creek were surveyed in 1996, 1998, and 2000. Overall habitat conditions were rated as poor to fair, with static to upward trends (Evans et al. 2003). Habitat conditions of Dorsey Creek was found to be good within exclosures, while better grazing practices were allowing for an upward trend in the riparian habitat of areas outside exclosures. The riparian habitat condition of Gance, Warm, Road Canyon, and Mahala Creeks were assessed in 1995 and found to be in poor (Mahala Creek), fair (Gance Creek), and good (Warm and Road Canyon Creeks) condition (White Horse Associates 1995). GAWS surveys were conducted on California Creek (1996), Pratt Creek (1999), Mahala Creek (2000), and Jim Creek (2002). The aquatic habitat condition of California, Mahala, and Jim Creeks was found to be fair, with the major limiting factors being intermittent flows, pool quality, and bank cover. The aquatic habitat of Pratt Creek was found to be in good condition.

Three LCT Recovery streams and one potential stream in the North Fork Subbasin have been found to contain non-native trout. Brook trout have been found in both the North Fork Humboldt River and Cole Canyon Creek, a headwater tributary to the North Fork. The population in the North Fork Humboldt River was thought to be stable and not expanding

until 1997, when a fairly robust brook trout population was found in Cole Canyon Creek. Pratt Creek, a potential recovery stream with no LCT population currently, has approximately 3.5 miles of habitat occupied by brook trout. Dorsey Creek was surveyed in 1998-1999 and found to contain a naturally reproducing population of rainbow trout.

The North Fork Subbasin has had relatively low angling pressure even though it has good access and is fairly close to population centers. Over the 10-year period, 1993-2002, seven of the LCT recovery streams in this subbasin have had angling use reported. The majority of the angling use (137 angler days/year) for the subbasin has occurred on the North Fork Humboldt River. The most accessible and heavily fished portion of this river contains a mixture of LCT and brook trout. Gance Creek is the second heaviest fished stream in this subbasin (52 angler days/year) and has an abundant population of LCT.

Genetic evaluations conducted in the late 1980's on five LCT populations in the North Fork Humboldt River Subbasin found no evidence of hybridization. Populations in the North Fork Humboldt River and California, Foreman, Gance, and Dorsey Creeks (1987) were found to be pure LCT. A sample from Dorsey Creek collected in 1999 was analyzed in 2003 and found to contain both hybrids and pure rainbow trout.

EAST HUMBOLDT RIVER AREA

In the 1983 LCT Fishery Management Plan, Sherman Creek was the only stream in the East Humboldt River Area that had been surveyed. By 1985, the last of the streams in this area had been surveyed and LCT were found to inhabit six streams, with eight miles of occupied habitat (Map 4). As most LCT streams in the East Humboldt River Area are isolated, there is very little metapopulation potential. The most recent surveys (1998-2003) have found LCT in five streams occupying an estimated 4.5 miles of habitat. During these surveys, all streams except Conrad Creek were found to have LCT populations at low densities. The small LCT population found in Conrad Creek in 1993 was not found in the 2001 survey, and may have been lost. In the early 1990's, LCT transplant projects to expand populations above known fish barriers have occurred on several streams in the East Humboldt Range, but have not been successful. In 1996, LCT from North Fork Cold Creek were transplanted into John Day Creek, a barren stream listed as a potential LCT recovery site. A survey conducted in the area of the transplant in 1998 found LCT, but none were found in 1998 or 2002. The LCT population in Sherman Creek was transplanted from Frazier Creek (Rock Creek Subbasin) in 1963.

Habitat surveys of all streams in the East Humboldt River Area occurred in the late 1970's and early 1980's. Streams on the west side of the East Humboldt Range were all found to be in fair to good condition. The 1985 survey of Sherman Creek and East Fork Sherman Creek found both to be in poor condition. Primary limiting factors were a lack of quality pools, and poor bank stability and cover. Sherman Creek was surveyed again in 1996 and was still found to be in poor condition, with a static to downward trend.

Of the six streams in the East Humboldt River Area, four (Fourth Boulder, Second Boulder, North Fork Cold Creek, and Conrad Creek) have populations of brook trout located within or near LCT occupied habitat. Three of the streams (Fourth Boulder Creek, Second Boulder Creek, and North Fork Cold Creek) have fish barriers between the LCT and brook trout occupied habitats. Both North Fork Cold Creek and Conrad Creek have barren reaches upstream of fish barriers (upstream of the LCT occupied habitat), but LCT transplants above these barriers appear to have failed. John Day Creek is the only potential recovery stream that is not occupied by brook trout.

LCT recovery streams in the East Humboldt River Area have had very little angling pressure over the 1993-2002 period. Again, angler access to these streams is very limited. The heaviest reported use has been on Second Boulder Creek (22 angler days/year) and North Fork Cold Creek (14 angler days/year). The data reported for North Fork Cold Creek is actually for all forks of Cold Creek (North, Middle, and South), and the mainstem. Only the North Fork contains LCT, while all forks and the mainstem contain brook trout.

Two of the trout populations in the East Humboldt River Area have been genetically analyzed. Conrad Creek and Fourth Boulder Creek were sampled in 1978 and 1985 and found to be pure LCT. LCT in Sherman Creek were introduced from the pure population in Frazier Creek.

SOUTH FORK HUMBOLDT RIVER SUBBASIN

The South Fork Humboldt River Subbasin has 15 streams identified with LCT populations and approximately 29.5 miles of occupied habitat. It is estimated that 102 miles of potential habitat exists within this subbasin (Map 5). There is some metapopulation potential in the South Fork Subbasin, even though a majority of the LCT populations are small and isolated. In the most recent surveys (1998-2003), many of the streams within this subbasin have been found to have decreased LCT populations and occupied ranges, and with drought and degraded habitats, some could possibly have perished. Of the 20 streams that have been resurveyed since the 1983 plan, only two (Carville Creek and Pearl Creek) have shown stable or increasing occupied ranges and populations. Of the remaining 18 streams, 13 were found to have decreased populations and ranges, and in five (Mitchell, North Fork Mitchell, Green Mountain, Rattlesnake, and Cottonwood Creeks) no LCT were found.

The displacement of LCT by introduced trout species, primarily brook trout, has had a significant impact in this subbasin. The 1983 LCT Fishery Management Plan noted that of 48 fishable streams along the west side of the Ruby Mountains, only five had LCT as the only trout species present. The most recent surveys have shown that of the 100 survey sites in streams of the South Fork Humboldt River Subbasin, there have been 21 sites where LCT were lost and replaced by non-native trout, and only 12 sites contained LCT as the sole trout species. In the 1979-1985 surveys, LCT were found as the sole trout species in 27 of the 100 sites.

Since the 1983 Plan, habitat surveys have been conducted on seven LCT recovery streams and two potential recovery streams. North Furlong, Mahogany, Lee, Welch, and Box Canyon (potential recovery stream) Creeks were surveyed in 1985 and found to be in good habitat condition. Brown Creek, another potential recovery stream, was surveyed in 1998 and found to have aquatic habitat in fair condition. The BLM administered portions of Mitchell Creek, Pearl Creek, and Dixie Creek were surveyed in 1994, 1997, and 2002 respectively. Habitat conditions were rated as poor to fair (upward trend) in Mitchell Creek and Pearl Creek. Dixie Creek was found to be in fair to good condition with an upward trend, but may have been set back by a wildfire in 1999. The most recent habitat surveys were conducted on Rattlesnake Creek (2000), Green Mountain Creek (2001), Toyn Creek (2003), and Corral Creek (2003). Rattlesnake Creek and Green Mountain Creek (including North Fork, South Fork, and mainstem) were found to have aquatic habitat in good condition, while the data from the Toyn Creek and Corral Creek surveys had not been summarized as of this writing.

A total of 13 recovery streams and all six potential recovery streams in the South Fork Subbasin are known to contain non-native trout. Brook trout are by far the most common, occurring in all 18 streams at populations ranging from 71 to 1,144 fish per mile. Rainbow trout are known to occur in Long Canyon Creek (1990), but at very low densities. Non-native trout are known to occur in three of the five streams in which LCT have recently disappeared in this subbasin. In 2002, a temporary fish barrier was constructed on the mainstem of Green Mountain Creek just below the confluence of the North and South Forks. Both of these forks, including all of the South Fork and that portion of the North Fork below the LCT occupied habitat, were then treated to remove the brook trout population in 2003. It is hoped that the remaining LCT in the North Fork will colonize the unoccupied areas of both forks while the barrier prevents upstream movement of the brook trout from the lower mainstem.

The South Fork Humboldt River Subbasin has had very little angling pressure over the 1993-2002 period. Average angler use of the 20 recovery streams during this period was seven angler days/stream/year. Pearl Creek, an easily accessible stream, had the highest reported use at 86 angler days/year. With only two exceptions (Lee Creek and Carville Creek), all of the recovery streams in this subbasin that have reported angler use are occupied by a mixture of LCT, brook trout, and rainbow trout. Lee Creek, with 26 angler days/year, is the heaviest fished stream that is occupied solely by LCT.

Genetic evaluations have been conducted on fish from nine of the recovery streams in the South Fork Subbasin. All nine of these streams were found to have pure LCT, but Long Canyon and Segunda Creeks were also found to contain hybrids. Samples collected from Long Canyon Creek in 1978 were found to be pure LCT, while another sample collected in 1979 was found to contain pure rainbow trout (Gall and Loudenslager, 1981). In 2000, trout collected from lower Long Canyon Creek were found to be hybrids and pure rainbow trout (Peacock 2003). A sample of trout from Segunda Creek taken in 1986 was

found to contain first generation hybrids along with pure LCT (Bartley and Gall 1989). The same results were found from a sample collected in 2000.

MAGGIE CREEK SUBBASIN

The Maggie Creek Subbasin has seven LCT populations within approximately 28 miles of occupied habitat. It is estimated that 94 miles of potential LCT habitat occurs within the subbasin (Map 6). Currently there is metapopulation potential during normal or above normal water years. All recovery streams within the subbasin have had fish populations resurveyed since the 1983 Plan. LCT populations in Coyote Creek and Little Jack Creek have increased both in numbers and occupied range over what was found in the 1977 intensive surveys. No LCT were found during the 1996 surveys of Jack Creek, a potential recovery water, or lower Little Jack Creek, but small populations have been observed in both of these areas (AATA International, Inc. 1997; Evans, personal communication). Beaver Creek and its tributaries (Williams Canyon Creek, Toro Canyon Creek, and Little Beaver Creek) had relatively stable to increasing LCT populations in the 1990's through 2000, but a major fire in 2001 and drought has led to greatly reduced population numbers and occupied habitat. Maggie Creek proper has also shown an LCT population with decreasing range and numbers. A 1997 survey of Maggie Creek from the narrows to the headwaters failed to produce any LCT within the survey stations, but three trout (presumably LCT) were observed in very large pools outside of one survey station. In the spring of 2000, a new LCT population was discovered in Lone Mountain Creek, a headwater tributary to Maggie Creek. This population occupies approximately 0.5 mile of habitat on private and BLM land.

Cooperative efforts involving BLM, mining, and ranching interests have led to improved habitat conditions in nearly all streams in the Maggie Creek Subbasin. Recent habitat surveys have shown a majority of the streams in fair to excellent habitat condition with an improving trend (Evans et al. 2003). Williams Canyon Creek and Little Beaver Creek are the only streams identified with poor habitat condition, with Williams Canyon Creek in a downward trend and Little Beaver Creek in an upward trend. Jack Creek and Susie Creek (potential recovery streams) were also found to be in poor condition, with trend ranging from static-down to up. A majority of Beaver Creek was also in an upward trend, but a major fire in 2001 led to setbacks within this large drainage. Projects to improve the connectivity of Maggie Creek with its tributaries, including modifying a diversion and removing road culverts, are currently being explored. These efforts will be critical in establishing the Maggie Creek Subbasin as a functioning metapopulation.

The potential for dewatering from mining activities also exists in this subbasin. Preliminary information indicates portions of LCT streams within the Maggie Creek Subbasin may lose baseflows as a result of mine dewatering activities in the future. The potential exists for further isolation of tributary streams as a result of dewatering in Maggie Creek. Susie Creek, a potential recovery water, could be substantially impacted by

dewatering in the future (preliminary information-Draft Cumulative Impact Analysis of Dewatering Operations).

Currently, no streams within the Maggie Creek Subbasin are known to contain non-native trout. In the past, brook trout were known to inhabit Spring Creek, a small tributary to Maggie Creek, but recent intensive surveys failed to contact any trout (AATA International, Inc. 1997).

Angler questionnaire data for the 1993-2002 period for the Maggie Creek Subbasin recovery streams shows three of the seven had reported angling pressure. Maggie Creek proper sustains the highest use at 27 angler days/year, while Coyote Creek had an average of 20 angler days/year.

Genetic evaluations of trout from the Maggie Creek Subbasin have been limited. A sample of trout from Coyote Creek was analyzed in 1979 and found to be pure (Gall and Loudenslager 1981). In 1992, mtDNA analysis was conducted on a different sample from Coyote Creek and again found to be pure (Williams and Shiozawa 1992). The LCT population in Little Jack Creek was sampled in 1997 and also found to be pure (AATA International, Inc. 1997). An ongoing study by Trout Unlimited in Maggie Creek, Beaver Creek, Coyote Creek, and Little Jack Creek is being conducted to evaluate the effectiveness of barrier removal by monitoring movement of LCT within the drainage and documenting any changes to local tributary populations. This study will include genetic analysis of LCT to assess the level of genetic differentiation among populations.

ROCK CREEK SUBBASIN

The Rock Creek Subbasin has six LCT populations occupying approximately 20.5 miles of habitat. It is estimated that 53 miles of potential habitat exists within the subbasin (Map 7). This subbasin is unique in that it contains the only reservoir identified as a potential LCT recovery site in the Upper Humboldt Basin. During normal water years, some metapopulation potential exists in the upper Rock Creek area and the streams above Willow Creek Reservoir. Historically, the small population of LCT in Willow Creek Reservoir were known to migrate up Willow Creek to spawn. A survey of upper Willow Creek in 2001 found a large adult LCT approximately two miles above the reservoir. It is assumed that this fish migrated upstream from the reservoir to spawn, and then became trapped as flows in the stream dropped. Recent population surveys (2001-2002) found Toe Jam Creek and Frazier Creek to have the only stable/increasing LCT populations in the subbasin. Upper Rock Creek, Lewis Creek, and Nelson Creek all exhibited decreasing populations and a slight decrease in occupied range. Trout Creek, a potential recovery water, was known to have LCT in the 1940's as evidenced by photos of stringers of trout that had been caught there. Ranchers in the area also reported that trout were caught in Trout Creek as late as the 1960's (Evans, personal communication).

Past surveys on upper Willow Creek used older maps that had upper Willow, Nelson and Lewis Creeks originating from the same area, with the large tributary to the south being known as South Fork Antelope Creek. New maps show that the area surveyed as upper Willow Creek in 1977 is actually the lower reaches of Nelson and Lewis Creeks. The large tributary to the south is now called upper Willow Creek. In terms of reading the map, this change makes sense; but it does have some ramifications. The USFWS Recovery Plan shows one mile of habitat in upper Willow Creek that is occupied by LCT. This one mile of habitat is actually in the lower reach of Nelson Creek, just before the Lewis Creek confluence. Upper Willow Creek, from Willow Creek Reservoir to the headwaters, had never been officially surveyed before 1996.

Habitat condition data collected in 2002 and 2003 in the Rock Creek Subbasin show all streams except Upper Willow Creek to be in fair to good condition with primarily a static-downward trend. Nelson and Frazier Creeks were found to be the only streams within the subbasin that were exhibiting an upward trend in habitat condition. A majority of the streams in the subbasin will be grazed under a riparian-friendly grazing system beginning in 2004.

In the past, brook and rainbow trout were stocked in Willow Creek, Rock Creek, Nelson Creek, and Willow Creek Reservoir, but none have been found in recent surveys. A warmwater recreational fishery has been established at Willow Creek Reservoir through the stocking of white crappie (*Pomoxis annularis*), largemouth bass (*Micropterus salmoides*), channel catfish (*Ictalurus punctatus*), and white catfish (*Ictalurus catus*).

All recovery streams in the Rock Creek Subbasin, except upper and lower Willow Creek, had angling pressure reported over the 1989-1998 period. Again, pressure was very light with Nelson Creek (37 angler days/year), Rock Creek (18 angler days/year), and Toe Jam Creek (8 angler days/year) having the majority of angling pressure. The recreational warmwater fishery at Willow Creek Reservoir, a potential recovery water, sustained the heaviest pressure at 3,211 angler days/year.

Genetic evaluations have been conducted on four (Frazier Creek, Nelson Creek, Upper Rock Creek, Toe Jam Creek) of the six LCT recovery populations in the Rock Creek Subbasin and no evidence of hybridization has been found.

REESE RIVER SUBBASIN

The Reese River Subbasin has a total of eight streams with LCT populations occupying approximately 12.5 miles of habitat. There is an estimated 67 miles of potential habitat within this subbasin, with very little metapopulation potential (Map 8). Extensive displacement of LCT by non-native trout has occurred in the Reese River Subbasin. The latest fish population surveys (1997-2002) have found that nearly all LCT populations have decreased in numbers and occupied range since the 1980 comprehensive surveys, while non-native trout have expanded their range and numbers. Four of the streams, including

North Fork Stewart, Middle Fork Stewart, Cottonwood, and Marysville Creeks, had populations estimated at less than 100 individuals. No LCT were found in the mainstem of Stewart Creek in the 1999 survey. The 1997 survey of Washington Creek found a good population of LCT and a slightly reduced occupied range. This LCT population is from an introduction of Frazier Creek LCT in 1972, after the historic population had been lost.

Washington Creek is the only recovery stream in the Reese River Subbasin that has not had a habitat resurvey since the 1980 comprehensive surveys. During the 1997 fish population survey on Washington Creek, an ocular survey of the habitat found it to be in fair to good condition. Habitat surveys were conducted on the remaining recovery streams during 1990, 1991, and 2001, and three potential recovery streams in 1998, 1999, and 2001. Habitat conditions were rated as fair on all of the streams during these surveys. The primary limiting factors were lack of quality pools and poor bank stability and cover.

Six of the nine recovery streams in this subbasin have populations of non-native trout including brook, rainbow and brown trout (*Salmo trutta*). Three of the streams, Washington, Crane Canyon, and Mohawk, are only occupied by LCT. In 1989, a portion of Crane Canyon Creek was treated to remove brown trout. This project was considered a success as no non-native trout were found in the treated area in the 1990 or 2001 surveys. The North and Middle Forks of Stewart Creek were occupied solely by LCT in 1990, but the 1999 surveys found that brook trout had moved into these headwater areas. This has also occurred on Cottonwood Creek with rainbow trout and brook trout. In 2003, a temporary fish barrier was constructed on lower Cottonwood Creek in preparation for the removal of non-native trout from the drainage. Of the four potential recovery streams, San Juan Creek has populations of brook, rainbow, and brown trout, Illinois Creek has a population of both brook and rainbow trout, Big Sawmill Creek has brook trout, rainbow trout, and possible cutthroat-rainbow hybrids, and Corral Creek is barren. Illinois Creek was also treated in 1989 to remove non-native trout, but the treatment was unsuccessful.

Average angler questionnaire data from 1993-2002 shows that the Reese River Subbasin recovery streams receive nearly as much angling pressure as all other subbasins in the Upper Humboldt Basin combined. Stewart Creek (including the North and Middle Forks) had the heaviest use with 335 angler days/year, followed by Washington Creek at 160 angler days/year and Cottonwood Creek at 120 angler days/year. All other recovery streams in the subbasin average less than 14 angler days/year. Of the potential recovery streams, San Juan Creek has the heaviest use at 714 angler days/year, followed by Illinois Creek with 11 angler days/year. Corral Creek, a barren stream, is the only stream in the subbasin that has had no reported angler use during this period.

Genetic evaluations have been conducted on six different populations in the Reese River Subbasin, with evidence of hybridization being found in Cottonwood Creek only. The sample collected from fish in Cottonwood Creek was found to contain pure LCT, pure rainbow trout, and hybrids (Peacock 2003). The suspected hybrids and pure LCT from the

1990 surveys of Stewart Creek and Big Sawmill Creek were based on observation only, and have not been genetically tested.

SOUTH FORK LITTLE HUMBOLDT RIVER AREA

A total of eight LCT populations occupying 28 miles of habitat have been identified in the South Fork Little Humboldt River Area. This area has an estimated potential of 42 miles of LCT habitat (Map 9). The USFWS Plan recognized four LCT populations found during past surveys including the South Fork Little Humboldt, Sheep Creek, Secret Creek, and Pole Creek. Population surveys in 1996 found reduced populations and occupied habitat in these streams, while the most recent surveys (2001) found these populations to have increased slightly. Surveys completed in 1997 found three additional LCT populations in the previously unsurveyed Snowstorm Creek, First Creek, and Winters Creek. Snowstorm Creek had a population of LCT occupying approximately 4.5 miles of habitat. Both Winters Creek and First Creek were only occupied just above the confluence with the South Fork Little Humboldt. First Creek has an estimated potential of five miles of habitat, while Winters Creek has a potential of approximately one mile. LCT have been observed in Oregon Canyon Creek, but this stream has never been surveyed. As all eight of these recovery streams are connected, the potential for a metapopulation is good.

The latest habitat surveys on streams in the South Fork Little Humboldt River Area were conducted from 1997 through 1999, and 2003. Pole Creek was surveyed in 1992 and found to be in fair condition. Since then, range fires (1996) have destroyed much of the riparian area in the lower portion of the stream. The upper portion of this stream was surveyed again in 2003 and found to still be in fair condition. The South Fork Little Humboldt River from Pole Creek to Rodear Flat was surveyed in 1998 and found to be in good condition. This section is in a designated Wilderness Study Area and portions have been excluded from grazing for several years. Snowstorm Creek, First Creek, and Winters Creek were surveyed in 1997 and the habitat was found to be in fair to good condition. The habitat condition of the BLM administered portions of Sheep Creek, Secret Creek, Oregon Canyon Creek, and the South Fork Little Humboldt River from Pole Creek to the headwaters was surveyed in 2003. All were found to be in poor to fair condition with primarily a static trend.

Angler questionnaire data for the 1993-2002 period for the South Fork Little Humboldt Area streams shows that only one of the eight had reported angling pressure. Angler use on the mainstem South Fork Little Humboldt River was reported at one angler day/year.

No stocking records have been found that show the South Fork Little Humboldt streams have ever been stocked with non-native trout. Brook trout may have been stocked in Pole Creek at one time, but no non-native trout have ever been found during surveys of the recovery streams in the area. Genetic evaluations on four LCT populations from the South Fork Little Humboldt Area have found no evidence of hybridization.

PINE CREEK SUBBASIN

The Pine Creek Subbasin has two streams (Pete Hanson and Birch Creeks) with LCT populations occupying approximately five miles of habitat. The LCT in Pete Hanson Creek were transplanted from Shoshone Creek (Big Smokey Valley Drainage System) in 1979. As no stocking records exist for any transplants into Birch Creek, it was hoped that this population represented a relic strain from the Pine Creek Subbasin. Unfortunately, recent phylogenetic analysis suggests that these fish were transplanted from a Western Basin population, most likely the East Carson River (Peacock 2003). Fish population surveys of these two streams in 1998 and 2003 found that both had strong LCT populations occupying a majority of the available habitat. Trout Creek, a potential recovery water, had a remnant population of LCT in 1980, but a subsequent survey in 1984 found only rainbow trout, brook trout, and possible hybrids. During a fire rehabilitation tour in 1999, rainbow trout and a single trout with hybrid characteristics were found in the upper portion of Trout Creek. The two other potential recovery waters within the subbasin, Henderson and Vinini Creeks, have not been surveyed since 1984. The Pine Creek Subbasin has an estimated 13+ miles of potential habitat with no metapopulation potential (Map 10).

Habitat surveys in the Pine Creek Subbasin occurred in 1984 and 2000. Birch, Pete Hanson, Henderson, and Vinini Creeks were surveyed in 1984 and found to be in fair condition. Trout Creek was surveyed in 2000 and found to have an upward trend due to exclosures. In 1999, a range fire destroyed a majority of the watershed and riparian area along Trout Creek.

Angler questionnaire data for the 1993-2002 period for the Pine Creek Subbasin shows two of the streams had reported light angling pressure. Pete Hanson Creek had the heaviest use at 13 angler days/year.

Trout Creek, Vinini Creek, and Henderson Creek are known to contain non-native trout. In 1984, rainbow trout were found in Vinini and Henderson Creeks, while rainbow trout and brook trout were found in Trout Creek. The sample collected from Trout Creek in 1999 was analyzed and found to be a hybrid (Peacock 2003). Genetic evaluation of the LCT in Birch Creek (1989) and Pete Hanson Creek (2003) has also been conducted and the fish were found to be pure.

INTERIOR NEVADA BASINS

As early as 1873, early settlers transplanted LCT into Interior Nevada Basins outside of their historic range (Coffin 1983). The out-of-basin populations covered in this plan include eight streams with an estimated 13.5 miles of occupied habitat. There is approximately 24 miles of potential LCT habitat in these streams (Map 11). Latest surveys (1995-2000) show strong LCT populations in only Sante Fe Creek and Shoshone Creek. Small populations were found in Mosquito Creek, South Fork Thompson Creek, Decker

Creek, and Moores Creek, while no LCT were found in West Fork Deer Creek. The USFWS LCT Recovery Plan states that **state wildlife agencies should continue implementing management for LCT populations in out-of-basin range**.

Habitat surveys have been conducted on three Interior Basin LCT streams in the 1990's. North Fork Pine Creek was found to be in fair condition, with pool:riffle ratio, pool quality, and bank stability being the major limiting factors. West Fork Deer Creek was found to be in good condition within the exclosures, and Decker Creek was found to be in excellent condition. All other Interior Basin LCT streams have not had habitat surveys since 1982 or earlier.

Six of the Interior Basin LCT streams have populations of non-native trout. Brook trout occur in West Fork Deer Creek and South Fork Thompson Creek; brook trout and brown trout occur in North Fork Pine Creek and Moores Creek; brown trout occur in Decker Creek; and brown trout, rainbow trout, and possible hybrids occur in Mosquito Creek. Recent surveys have shown the non-native trout in North Fork Pine Creek and Decker Creek have moved into and above the LCT occupied habitat. The brook trout in South Fork Thompson Creek are separated from the LCT population by a natural waterfall barrier. Native rainbow trout (redband) were also known to occur in West Fork Deer Creek (Snake River Drainage), but none were found in the most recent survey.

Angler questionnaire data for the 1993-2002 period for the Interior Basin LCT streams shows relatively heavy angler use in two of the streams. North Fork Pine Creek (603 angler days/year-primarily on the mainstem of Pine Creek) and Mosquito Creek (223 angler days/year) provide 99 percent of the angler use in the Interior Basin populations. Both of these streams have large populations of non-native trout in their lower reaches due to continued stocking.

Hybrid analysis has been conducted on one of the populations of LCT in the Interior Basins. LCT from Shoshone Creek (Big Smokey Valley Drainage System) were analyzed and found to be pure. Recent population-level phylogenetic analysis of the LCT populations in Shoshone and Sante Fe Creeks found that these populations were most closely related to LCT populations in the Reese River Subbasin (Peacock 2003).

RECOVERY OBJECTIVES

The primary objectives of the Upper Humboldt Plan are to recommend actions that will improve the status of LCT in the Upper Humboldt River basin to a point where these populations will no longer require protection under the Endangered Species Act, and direct on-going recovery actions for populations after delisting. This plan will be the management guide the NDOW will use to reach those objectives. The Upper Humboldt DPS Team has further refined these objectives to include the formation of at least one secure and functioning metapopulation of LCT in each subbasin. Isolated, priority, and potential metapopulations within each subbasin have been delineated by the Upper Humboldt DPS Team (See Maps 2-11). Priority metapopulations are those that have the potential for LCT populations to be connected in the short term (1-10 years), potential metapopulations are those that may have the potential to be connected in the long term (>10 years), and isolated populations have no potential to be connected and will be managed as isolates. The rational used in these selections is explained in the following Recovery Actions Section of the Upper Humboldt Plan. Existing metapopulations and isolated populations will continue to be managed as conservation populations after delisting, i.e. in a manner that will maintain and enhance the long-term security of the LCT populations. To enhance the long-term persistence of conservation populations, the NDOW will strive to expand metapopulations as opportunities arise in areas that have potential.

The USFWS Recovery Plan for the Lahontan Cutthroat Trout maintains that the three distinct population segments may be delisted separately. **LCT population segments** (i.e. Humboldt River Basin) **will be considered for delisting when management has been instituted to enhance and protect habitat required to sustain appropriate numbers of viable self-sustaining populations**. **A viable population is considered to be one that has been established five or more years and has three or more age classes of self-sustaining trout as determined through monitoring. Proper management of watersheds, riparian areas, and SMZ's will provide good quality habitat for LCT and maintain populations where interspecific competition with other salmonids is not an influencing factor** (USFWS LCT Recovery Plan)**.**

In the USFWS LCT Recovery Plan, the Upper Humboldt River Basin population segment consists of some 90 populations of LCT, and nine potential sites. Of the existing populations, seven are located in interior Nevada basins, and the rest are located in subbasins within the Humboldt River Basin. All potential sites are also located within the Humboldt River Basin. These potential sites will be evaluated by the Upper Humboldt DPS Team to determine metapopulation and recovery potential. Those deemed unsuitable will be removed from the list and further consideration. Additional potential sites that have been deemed best suited for recovering metapopulations of LCT have been selected by the Upper Humboldt DPS Team. The objective of the USFWS LCT Recovery Plan was to maintain and enhance the current or recently existing populations in the **Marys River subbasin (17 populations), North Fork Humboldt River subbasin (12 populations),**

East Humboldt River area (6 populations), South Fork Humboldt River subbasin (20 populations), Maggie Creek subbasin (7 populations), Rock Creek subbasin (6 populations), Reese River subbasin (9 populations) (USFWS LCT Recovery Plan), Pine Creek Subbasin (2 populations), and the South Fork Little Humboldt River Area (4 populations).

RECOVERY ACTIONS

This section defines the management actions available to enhance and maintain LCT populations and habitat. These management actions will be prioritized by the DPS team on a subbasin level and stream level. The DPS Team will utilize the following criteria to define the priority and ranking of streams for management actions.

- Metapopulation Potential (Potential for interconnected LCT populations).

Metapopulation dynamics are important considerations in conservation planning and species maintenance and recovery efforts (Rieman et al. 1993). Dunham et al. (1997) found the only significant correlate to LCT occurrence in the eastern Lahontan basin was stream basin isolation. Maintaining strong populations in the best possible habitats throughout the landscape and preserving metapopulation structure and function are the best hedges against extinction (Rieman et al. 1993). Long-term recovery efforts in the Upper Humboldt Plan will focus on those areas with the greatest metapopulation potential. Metapopulation capabilities and priorities within the Humboldt River subbasins will be assessed by the DPS Team. The preliminary Population Viability Analysis modeling research being conducted by the University of Nevada-Reno (UNR) may provide the appropriate tool for prioritizing subbasins in which to focus limited resources.

- Threat of Extinction (Very depressed populations and/or occupied habitat).

Some subbasins have LCT populations that are very depressed, occupy a very small area, and are geographically isolated.

- Threat of Hybridization (Potential loss of genetic purity).

The potential of hybridization with introduced rainbow trout would be ranked as a more significant threat than competition/displacement from other non-native trout species.

- Threat of Competition/Displacement (Increased isolation and potential loss of LCT populations).

Although the effect of non-native trout on LCT populations is variable, the typical effect is isolation of LCT in headwater areas while non-native trout populations occupy downstream areas.

- Private Landowner Cooperation.

Private landowner cooperation will be crucial to realize the metapopulation potential of a majority of the subbasins in the Upper Humboldt River Basin. The NDOW and USFWS will develop a Programmatic Safe Harbor Agreement (SHA) covering proposed management

activities affecting lands of participating private landowners within the Upper Humboldt River Basin. This SHA will authorize NDOW to enroll participating landowners with Certificates of Inclusion once landowners sign individual Conservation Agreements that describe actions that will be taken to maintain or enhance LCT populations or habitats. The Safe Harbor program encourages proactive conservation efforts by non-Federal landowners while providing them certainty that future property use restrictions will not be imposed if those efforts attract LCT to their enrolled property, or result in increased numbers or distributions of LCT already present. In return for voluntary conservation commitments, the Agreement will extend to the participating landowner assurances allowing future alteration or modification of the enrolled property back to its original baseline conditions.

- Unique Opportunities

As has been observed in the past, other opportunities may come about that could be utilized to improve the status of LCT. These could include, but are not limited to, conservation easements, land exchanges, acquisitions, mitigation for mining activities, etc..

- Habitat Suitability (Adequate habitat in suitable condition).

Assessment of habitat suitability by the DPS Team will be based on an inventory of key aquatic and riparian habitat attributes utilizing accepted methodologies.

The following list of recovery actions is not the complete list compiled by the USFWS and cooperating agencies, but includes those that are the primary responsibility of the NDOW. As habitat management and improvement is a high priority for LCT recovery, it will also be listed below.

<u>Habitat Management</u>

Hickman and Raleigh (1982), provide general guidelines for optimal riverine habitat for cutthroat trout in their habitat suitability model. More specific habitat parameters will be developed for streams within the Upper Humboldt Basin by the DPS Team. Hickman and Raleigh characterize optimal riverine cutthroat trout habitat by:

1. Clear, cold water with an average maximum summer temperature of <22°C (72°F).
2. An approximate 1:1 pool riffle ratio.
3. Well vegetated, stable stream banks.
4. Twenty-five percent or more of the stream area providing cover.
5. Relatively stable water flow regime with less than 50 percent fluctuation from average annual daily flow.
6. Relatively stable summer temperature regime, averaging about 13°C (55°F) with variations of about 4°C (7°F).

7. A relatively silt-free rocky substrate in riffle-run areas.

The USFWS LCT Recovery Plan provides the desired physical characteristics of the Streamside Management Zones. **Streamside management zones (SMZ), including the green line and riparian areas, associated with LCT streams should be in a good to excellent condition. This includes management to assure that:**

1. **Desired key riparian plant community types or species (woody and herbaceous) are present, reproducing, and have high vigor.**
2. **Cover of key species is 90 percent or greater of estimated potential.**
3. **Soil productivity should not be significantly reduced by compaction from estimated potential.**
4. **Streambank stability is restored to estimated potential condition.**

Grazing practices on federal lands within watersheds and the SMZ should be managed to achieve desired LCT habitat conditions (USFWS LCT Recovery Plan)**.** Recommended livestock grazing guidelines are identified in Appendix A of the 1996 Memorandum of Agreement between the USFWS, NDOW, USFS, and BLM. **Watersheds should be managed to achieve desired future condition objectives and prevent degradation of SMZ, riparian areas, streambanks, and stream water quality. Strategies to achieve desired habitat conditions should be identified in land-use activity plans.**

All land-management agency activity plans involving LCT habitat should be monitored, evaluated, and updated on an as needed basis, at least every ten years. Effectiveness monitoring should be completed annually until vegetation shows evidence of improving or attaining future desired condition. Monitoring can then be adjusted to evaluate achievement of long term goals and objectives, and before the next update of the land management activity plan. Land use activity plans should be evaluated and revised if watershed, SMZ and riparian objectives are not being achieved. Best management practices should be initiated to reduce non-point source pollution problems on LCT streams.

Coordination between the NDOW, USFS, USFWS, and the BLM in establishing and maintaining an inventory of aquatic habitat attributes will be extremely important in the monitoring and evaluation of LCT habitat. Accepted methodologies will need to incorporate a set of agreed upon key variables that can be collected in a timely and consistent manner. The transect method of stream survey (including GAWS and BLM manuals 6670 and 6720-1 versions) has been the preferred method used by the NDOW and BLM for monitoring aquatic fisheries habitat. These methodologies have the largest continuous database of Upper Humboldt Basin recovery streams. Incorporating this database, along with fish population data, into a Geographic Information System (GIS) format would improve the process of prioritization and coordination between the involved agencies. Due

to the large number of occupied and potential LCT streams in the Upper Humboldt Basin, the available resources (staffing, funding) will also need to be coordinated to effect stream habitat monitoring.

Fish Population Monitoring

Monitoring of LCT populations is an integral part of NDOW fisheries responsibilities and will continue on a regular basis. LCT populations were to be monitored every five years to determine population viability, identify problem areas, and evaluate management. In addition, status and trend of non-native trout and endemic nongame fish will also be monitored. The use of stream survey station locations established during the Cooperative Stream Survey Project of the late 1970's and early 1980's will be evaluated for use as baseline in future monitoring efforts. Population sampling methods will vary depending on the objective of the sampling. A Program and Procedure for fish population sampling will be developed by NDOW, in consultation with the DPS Team.

The first five-year monitoring sequence was completed on all occupied LCT streams in 2001. At this time, some streams were removed from the five-year monitoring schedule as their LCT populations and habitats have become more secure. This has allowed for the concentration of resources and staffing on LCT streams that are more at risk. In the near future, intensive fish population surveys utilizing multiple pass electroshocking will be conducted on representative streams in each subbasin. This will allow for the concentration of resources into high priority recovery actions (e.g. stream treatment and reintroduction projects). Streams slated for intensive fish population surveys will be selected by the DPS Team.

In the case of reintroduced LCT populations, monitoring will be conducted once every three years until the population is deemed to have reached viable levels. Ongoing research by UNR on LCT population viability analysis will be applied to determine the number and size of populations needed for long-term LCT persistence.

Fish Population Management

The introduction of non-native trout has had a profound impact on LCT populations in the Upper Humboldt Basin. While incidence of hybridization in the Upper Humboldt Basin is much less than that found in the lower reaches of the Humboldt, displacement of LCT by brook trout has become a major concern. Within the Ruby Mountains of the Upper Humboldt Basin, more than 95 percent of the LCT populations have been lost because of displacement by other trout species (Coffin 1983). **Displacement can occur in any system where other salmonid** (trout) **species exist, and the potential is high that displacement will reduce the LCT population, maybe to the point of extinction. Habitat proposed for LCT management should be protected from non-native**

salmonids. In specific stream systems, non-native trout should be removed and streams restocked with LCT (USFWS LCT Recovery Plan)**.**

Streams selected for fish population management (including treatment, introductions, reintroductions, and augmentations) will be prioritized based on the threat to the existing LCT population (hybridization vs. competition/displacement).

The following alternatives could be utilized to manage the impacts of non-native trout.

- No Action.

This alternative could be used if the potential threat to an existing LCT population is low or if a chemical treatment is not feasible. It also may be used if a treatment poses a threat to other species of concern, and the threat cannot be mitigated.

- Physical Removal.

This alternative would be used to manage non-native trout populations that occur in the same habitat as the LCT populations, without harming the existing LCT populations. It could also be used if a chemical treatment posed a threat to other species of concern.

- Chemical Removal.

This alternative would be used to eliminate non-native trout through the application of a fish toxicant. Stream treatment projects that have proven successful in removing non-native and hybrid trout in the Bonneville Drainage Basin will be used in the Upper Humboldt Basin. This process involves two consecutive day-long treatments at a treatment strength prescribed by the manufacturer of the toxicant. Upon approval of the Upper Humboldt Plan, streams will be selected for possible treatment and habitat and fish population surveys will be conducted on these streams. Information collected during these surveys, and others (macroinvertebrate and amphibian surveys), will be included in treatment project proposals prepared in accordance with the Fishery Rehabilitation section of Commission Policy Number P-33. It may also be necessary to gain approval to treat a second year to allow for selective treatment to confirm success and possible re-treatment if needed.

Reintroduction of LCT into treated streams will commence after a thorough evaluation is completed to make certain of the success of the treatment. The schedule of treatments will remain as flexible as possible to allow for unexpected events. This process will continue until all suitable stream treatments within the Upper Humboldt Basin have been completed. The suitability and priority of streams to be treated will be based on the following criteria:

1. The stream or portion of stream to be treated provides adequate habitat in suitable condition.

2. The stream has a population of non-native trout that is a threat to an existing or potential LCT population.

3. The stream or portion of stream has natural or man-made fish barriers to prevent the reestablishment of non-native trout from adjacent populations.

4. Private landowner concurrence will be needed before treatment on streams that are located all or in part on private land.

5. The stream should have limited conflict with existing sport fisheries (low angler use) to prevent the potential of reintroduction of non-native trout by anglers.

6. Conflicts with other listed, candidate, or sensitive wildlife species are absent or can be mitigated. Surveys for presence/absence of these species will be incorporated into the pre-treatment surveys on the stream.

Pure LCT and endemic nongame fish: redside shiner (*Richardsonius egregious*), speckled dace (*Rhinichthys osculus*), Tahoe sucker (*Catostomus tahoensis*), Lahontan mountain sucker (*Catostomus platyrhynchus*), Paiute sculpin (*Cottus beldingi*), tui chub (*Gila bicolor*) exist in many of the streams scheduled for possible treatment. Prior to the treatment, all LCT (if known to be pure) will be salvaged from the stream and reintroduced following the treatment. The need to salvage endemic nongame fish will be evaluated by the DPS Team on a site-by-site basis and will consider the ability of these species to reestablish from other stream reaches or adjacent streams. In streams where endemic nongame fish can naturally reestablish (interconnected streams), there will be no salvage effort. In some cases, a suitable number of endemic nongame fish will be salvaged for later reintroduction. When treating streams to remove non-native trout, efforts will be made to salvage and translocate the non-native salmonids to other sport fisheries.

Reintroduction of LCT

Within the Upper Humboldt Basin, there are 16 recovery streams and eight potential recovery streams that are barren or in which no LCT were found in the latest surveys. Many of these barren streams have had LCT populations in the recent past, or most likely contained populations of LCT historically, but habitat, water quality conditions, or competition with non-native trout contributed to their loss. **Annual year class production is highly variable, and the species has the capability of responding to improved environmental conditions with rapid increases in population abundance (Platts and Nelson 1983, 1988; Cowan 1991a). The recent drought from 1987 to 1992** (and 2000-

2002) **has decreased abundance of many LCT populations, and possibly caused extinction of some isolated stream populations in degraded habitats. Reintroductions may be appropriate for some of these recent extinctions if they cannot be naturally recolonized. Reintroduced LCT populations will not be considered established until they reach and maintain viable population levels** (USFWS LCT Recovery Plan)**.**

The reintroduction of LCT into barren streams within the Humboldt River Basin will be managed by the NDOW through consultation with the DPS Team. Streams that are slated for reintroduction of LCT without treatment to remove non-native trout will be prioritized based on the following modified synopsis of the American Fisheries Society Guidelines for Introductions of Threatened and Endangered Fishes and the Lahontan Cutthroat Trout Species Management Plan for the Quinn River/Black Rock Basins and North Fork Little Humboldt River Subbasin (Sevon et al. 1999):

1. Selecting the Introduction Site

   A. Introductions will be restricted to within the native or historic habitat.

   B. Introductions will be restricted to a protected site.

   C. The selected stream should allow for natural dispersion of LCT throughout the subbasin.

   D. The selected stream would fulfill the life history requirements of LCT.

   E. The selected stream contains sufficient habitat to support a viable population.

   F. The selected stream is protected from the invasion of non-native game fish species.

   G. Introductions outside of historic range should be prohibited if other rare or endemic taxa could be adversely affected.

In addition, if the stream, or significant portions of the stream is on private land, the landowner will need to be in agreement. The NDOW, in cooperation with USFWS, will secure Programmatic Safe Harbor Agreements within each subbasin. The NDOW will be the Permittee of the Agreement, with participating landowners being issued Participation Certificates or Certificates of Inclusion. In the event that an agreement cannot be negotiated with a private landowner, reintroductions will not proceed on the private property as the lack of a written agreement may preclude the stream from being counted towards delisting. However, this would not preclude reintroductions in headwater streams (on public land) that are located upstream of private property.

2. Conducting the Introduction

A. Choose introduction stock from an appropriate source (within hydrographic basin).

B. Examine taxonomic status of introduction stock.

Definitive genetic evaluation of the donor stock will be completed prior to any introductions.

C. Examine introduction stock for presence of undesirable pathogens.

Representative samples of LCT from possible donor streams will be evaluated for certain bacterial pathogens, viruses, and parasites as part of the Wild Fish Health Survey being conducted by the Ca-Nv (Coleman) Fish Health Center. Samples will be collected in accordance with fish disease collection protocols utilized for the Wild Fish Health Survey or NDOW Fish Health Assessment Policies.

D. Obtain introduction stock of sufficient number and character.

To increase the chance of a successful introduction, it has been recommended that a minimum of 50 fish, consisting of different age classes, be used in the initial introduction. All introductions should utilize at least two stockings (not necessarily in successive years) to ensure random selection of individuals from the entire donor population. As no more than ten percent of the available LCT population in a donor stream should be utilized annually for introductions, intensive monitoring of the donor population utilizing multiple pass electroshocking will be conducted before reintroduction efforts begin. The MicroFish computer software system (Van Deventer and Platts 1989) will be used to determine the population size and age class strength of the donor population.

E. Carefully and quickly transport stock.

F. Introduce stock under the most favorable conditions.

G. Document the translocation.

3. Post-Introduction Activities

A. Conduct systematic monitoring of introduced populations.

Once reintroduction is completed, monitoring of the fish population should be conducted at least once every three years until the population reaches viable levels.

B. Using the same donor stocks, restock or augment the population if warranted.

C. Determine cause of failures.

D. Document the findings and conclusions reached during the post-introduction process.

Augmenting LCT Populations

In most streams annual recruitment during good water years should be sufficient to distribute LCT (USFWS LCT Recovery Plan)**.** Many of the high mountain LCT streams in the Upper Humboldt Basin have barren reaches due to impassable fish barriers. Most of these areas are located in the headwaters of streams and are generally characterized by high gradient, relatively low flow, and generally good habitat conditions. In some of the streams, the areas below fish barriers are inhabited by both LCT and non-native trout. LCT populations in these streams could be expanded and protected over the short-term by establishing a population above the barrier. This action would not be used to exclude other management actions (habitat restoration, physical or chemical removal of non-native trout), but could be used to buy time in areas where threats are imminent. Intensive habitat evaluations of the reach of stream above the barrier would be conducted prior to the augmentation to determine if a sufficient amount of suitable habitat is available. Intensive population monitoring would also be needed to determine whether annual recruitment is sufficient to allow for removal of LCT to other reaches of a stream. Management actions (habitat restoration, physical or chemical removal of non-native trout) could be initiated on the reach of stream below the barrier once the augmentation has taken place. Population monitoring of the augmented LCT population would be scheduled similar to a reintroduced population.

Streams in which no LCT have been found during regular fish population surveys should be intensively spot electroshocked the following year to determine if the population is surviving at low densities or has actually been lost. If no LCT are found during the survey, an intensive stream habitat survey should be conducted to determine the cause of the extinction before any augmentation or reintroduction project is planned.

Angler Use and Harvest Monitoring

Angler use and harvest monitoring is conducted opportunistically by the NDOW through field contacts with anglers. As most of the LCT recovery streams and rivers in the Upper Humboldt Basin have very little angler use, the data collected through this manner is relatively sparse. The strongest database the NDOW has for a majority of these waters is from the annual angler questionnaire issued to ten percent of the licensed anglers. For small streams, the data can vary widely from year to year, but long-term averages can give a fair indication of angler use on a stream and can be used to provide comparisons

between streams. Appendix B shows angler use from 1993-2002, and the number of years reported for each stream. Many of the streams had angler use reported for only one or two years during the ten year period.

A majority of the LCT recovery streams, especially those with LCT only, have limited fishing pressure, due to their remote locations and very limited vehicle access. The LCT recovery streams exhibiting the highest angler use are typically those with non-native trout species in the accessible reaches of the stream, with LCT limited to the more remote headwater reaches. In some cases, angling pressure could impact LCT numbers. Prolonged drought can confine LCT populations to small pools making them more vulnerable to angling pressure. But no rare or endangered trout, including the LCT, has ever become so through over-fishing (Behnke and Zarne 1976). Environmental factors (e.g. unsuitable water temperatures, poor aquatic habitat conditions, low productivity) have much more influence over LCT populations. If a stream is not suffering from over-fishing under current regulations, changing to more restrictive regulations will not increase the population or size of the trout (Downing 2004).

Periodic monitoring of LCT recovery streams will be used to determine impacts from recreational angling. Restrictive regulations controlling fish size and creel limits, harvest methods, and season length could be developed to correct identifiable problems related to angler use. This would be accomplished through the NDOW's biennial fishing season and regulation setting process. Regulation changes will be brought before the DPS Team for review, but the State of Nevada Board of Wildlife Commissioners reserves its prerogative to establish regulations and regulation changes. Streams subject to the eradication/reintroduction process would be evaluated in terms of current and potential angler use to ascertain if restrictive regulations would be warranted. Management efforts that affect the angling public will be addressed each year through the County Wildlife Advisory Boards. For example, the selection of a popular stream fishery for treatment will be discussed with the appropriate County Wildlife Advisory Board.

Fish Stocking Evaluation

Since the 1983 Plan, it has been the policy of the NDOW to not stock competitive or hybridizing species of trout in LCT recovery streams. This prohibition will continue wherever applicable. Some streams in the Interior Nevada Basins that contain LCT in remote headwater reaches have lower reaches that are stocked with non-native trout. These fish populations are separated by barriers, but future stocking of these streams will need to be evaluated based on the security of the LCT habitat and the streams importance as a sport fishery.

Genetic Evaluation

Fish populations in streams of the Upper Humboldt Basin and Interior Nevada Basins that have been evaluated to determine hybridization are listed in Appendix C. A total of 39 populations have been analyzed for hybridization utilizing protein electrophoresis, mitochondrial DNA (MtDNA), or nuclear DNA. Nuclear DNA has also been used to determine the probable origin of several LCT populations within and outside of the Upper Humboldt Basin. The intent of the genetics analysis initiated in the late 1970's was to differentiate pure LCT populations from those that may be hybridized. Electrophoresis was the technique used during the 1970's and early 1980's. Population identification based on electrophoresis generally used nuclear markers inherited from both parents. Later genetics analysis used MtDNA, which can be very valuable in identifying within species differences. However, as MtDNA is maternally inherited only, it can lead to an underestimate of hybridization.

Genetic evaluations will continue on populations that have not been analyzed, with a priority given to those identified as donors for reintroductions. **Subsequent genetic analysis of reintroduced populations should also be monitored at appropriate intervals to evaluate potential loss of genetic variation by founder effect, genetic drift, or inbreeding depression** (USFWS Recovery Plan). Further genetic analysis of all populations within the Upper Humboldt Basin will continue, with populations slated for analysis to be prioritized by the DPS Team based on stocking history and proximity of rainbow trout populations. The LCT Genetics Management Plan, presently under contract with the USFWS, will recommend population management strategies that should be utilized when considering reintroductions and relocations. These strategies are intended to optimize within and among population genetic diversity of donor populations and reintroduced populations. Appendix E lists LCT populations in the Upper Humboldt Basin that have not had genetic evaluations. This list includes several populations that are currently undergoing analysis by the University of Nevada-Reno Biological Resources Research Center.

As techniques have become more refined, a small but consistent divergence has been found between cutthroat from the Humboldt Basin and cutthroat from the Lahontan Basin. Williams and Shiozawa (1992) used restriction fragment length polymorphism analysis of mtDNA to provide approximately 97 percent discrimination between Humboldt and Lahontan cutthroat trout. It was suggested that the Humboldt cutthroat is distinct and appears to have very recently diverged from the Lahontan cutthroat trout, and should be formally designated as a subspecies. Whether or not this occurs will not change the objectives or strategies of the Upper Humboldt Plan.

Fish Barriers

Natural or man-made fish barriers may be utilized to protect LCT occupied habitat from the establishment of non-native trout populations. The construction of fish barriers has become an important management tool on very large stream systems or on streams in which the complete eradication of non-native trout is questionable. Unfortunately, man-made barriers can be very expensive, are usually limited in application to areas where streams run through solid bedrock, and can increase extinction risk by isolating LCT populations. Field investigations by the NDOW, the appropriate land management agency, and the DPS Team will need to be conducted to determine the feasibility of each project.

Hatchery Propagation of LCT

The hatchery propagation of LCT for future introduction in streams of the Upper Humboldt Basin was not considered in the USFWS Recovery Plan. The major drawbacks to hatchery propagation are expense, disease transmission, potential for contamination of the gene pool, and domestication of wild stock. In nearly all cases in the Upper Humboldt Basin, LCT reintroduced into barren or eradicated streams can come from donor populations within the same subbasin. There is a possibility that a hatchery propagation program could be used for certain Upper Humboldt subbasins in the future. If no donor populations are available within a subbasin, evaluations should be made to ascertain if hatchery propagation of LCT would be feasible to assist in recovery efforts. LCT from hatchery operations would not be used to stock recovery streams on an annual basis, but could be used to assist in population expansion in subbasins that lack donor populations. Streams that needed to be stocked on an annual basis to maintain the LCT population could not be counted towards delisting. Criteria for the use of hatchery propagation, including other opportunities (stream-side incubators), will be evaluated in consultation with the DPS Team.

RECOVERY ACTION PRIORITIES BY SUBBASIN

The following section will provide the management actions recommended for each subbasin in order to achieve recovery objectives. All management actions are subject to the habitat being in suitable conditions and concurrence of the Upper Humboldt DPS Team. The DPS Team has identified currently occupied and potentially occupied drainages within each subbasin and ranked them in terms of priority metapopulations, potential metapopulations, and isolated populations (Maps 2-11). Priority for the implementation of management actions will be given to those subbasins that have the greatest metapopulation potential and/or have LCT populations in imminent danger. At this time, the Upper Humboldt DPS Team will focus management actions in the Marys River, South Fork Humboldt River, and Reese River subbasins. Management actions within other subbasins will be included as resources allow. Appendix D shows recovery streams by subbasin and a simplified list of the associated recovery objectives set in the USFWS Recovery Plan.

MARYS RIVER SUBBASIN

Recent land exchanges and improvements in riparian habitat management have contributed towards recovery efforts in this subbasin. Metapopulation potential in the Marys River Subbasin is very good as nearly all streams are connected. The priority metapopulation recovery area for the Marys River Subbasin will include all streams located upstream of the upper Marys River Ranch fenceline (Map 2). The major recovery actions for this subbasin include:

Habitat Management

Over half of the recovery streams in this subbasin are considered to be in good condition, and all of the streams have habitat conditions exhibiting an upward trend in comparison to baseline surveys (Attachment 1). Habitat management and monitoring will remain a high priority.

Fish Population Monitoring

Latest surveys show stable to declining LCT populations in many of the tributaries to the Marys River. Monitoring of the LCT populations in this subbasin will continue as needed until it is deemed that viable population levels have been reached.

Fish Population Management

The most prominent non-native trout populations in this subbasin occur in Currant Creek (rainbow trout and brook trout) and lower T Creek (brook trout). The treatment/reintroduction of these two streams will be a high priority in the implementation schedule. A majority of the land these streams cross is privately owned and a landowner agreement will be needed before treatment evaluation begins. Physical removal of non-

native trout is currently being utilized on the mainstem Marys River, and may be needed on Marys River Basin Creek. Other tributaries to the Marys River that have not been surveyed in recent years, including Hot Creek and Stormy Creek, may contain non-native trout that could pose a threat to the LCT population.

Augmenting LCT Populations

As the Marys River and some of its tributaries are very large systems, augmenting LCT populations in suitable habitat may be needed. LCT will be moved into streams only after habitat and fish population surveys have determined that the areas are suitable.

Angler Use and Harvest Monitoring

Regulation changes incorporating restrictive regulations on the Marys River and its tributaries were in effect from March 1, 1998 to March 1, 2002. During this period, surveys found that the LCT population had actually decreased. In the future, angler use will need to be monitored to evaluate whether any regulation changes are warranted.

Genetic Evaluations

All streams with LCT populations that have not had genetic evaluation are listed in Appendix E. A total of 14 streams within this subbasin have current or recently existing LCT populations that have not been analyzed. Evaluation priority will be based on the LCT populations' proximity to non-native trout populations and historic stocking records. Many of these streams are headwater tributaries that will have low priority for genetic evaluations. LCT populations scheduled to be used as donors for reintroduction projects will also need to have genetic evaluations completed.

Hatchery Propagation

There may be some potential in this subbasin for some type of hatchery propagation of LCT. Evaluations will be made to assess whether a program of this type would be feasible and economical in assisting with recovery efforts.

NORTH FORK HUMBOLDT RIVER SUBBASIN

Changes in habitat management on some of the headwater streams of this subbasin have led to improved LCT habitat and populations. Other areas are not in very good condition and some LCT populations may have recently been lost. The metapopulation potential of this subbasin could be increased through the improvement of habitat in the lower reaches of a majority of the tributaries. The priority metapopulation recovery areas for this subbasin will include the headwaters of the North Fork to the Pratt Creek confluence, Foreman/California Creek drainages, Mahala/Jim Creek drainages, and the Gance Creek complex (Map 3). The major recovery actions for this subbasin include:

Habitat Management

Portions of seven of the 12 recovery streams in this subbasin are known to be in good condition. These include Winters, Gance, Road Canyon, Foreman, Cole Canyon, and California Creeks. The USFS administered portion of the North Fork Humboldt River was also in good condition, while conditions on the BLM portion were variable. Changes in livestock management on portions of other streams (Gance, Jim, and Mahala Creeks) should lead to improved habitat conditions, primarily on USFS administered lands. Habitat management and monitoring will remain a high priority.

Fish Population Monitoring

Latest surveys show stable to declining LCT populations in many streams of the North Fork Subbasin, and some populations that may have been extirpated. As resources allow, populations in this subbasin will be monitored until it is deemed that viable population levels have been reached.

Fish Population Management

Three recovery streams (Cole Canyon Creek, Dorsey Creek, and the upper reaches of the North Fork Humboldt River) and one potential recovery stream (Pratt Creek) will need to be evaluated for possible treatment of brook and rainbow trout populations and reintroduction of LCT. Projects on Cole Canyon Creek and the upper North Fork Humboldt River may become a high priority as LCT populations have declined sharply in recent years. The habitat condition of the East Fork, West Fork, and mainstem Beaver Creek (potential recovery streams) will need to improve before a reintroduction project can be evaluated.

Augmenting LCT Populations

Recent surveys have found no LCT in Mahala, Jim, Dorsey, and Pie Creeks, and the lower (BLM) portion of the North Fork Humboldt River, and these streams will need to be evaluated for possible augmentation or reintroduction.

Genetic Evaluations

Seven LCT populations within this subbasin have not had genetic evaluations (Appendix E). Several of these streams are headwater tributaries that will have low priority for evaluation. Evaluation priority will be based on the LCT populations' proximity to non-native trout populations and historic stocking records. LCT populations scheduled to be used as donors for reintroduction projects will also need to have genetic evaluation completed.

EAST HUMBOLDT RIVER AREA

A majority of streams in this area are remote and relatively well protected from human influence. The potential for a metapopulation in this area is very poor as few of the streams are connected. For LCT populations to become connected, a series of temporary barriers (and permanent barriers) and stream treatments will need to be planned. The priority metapopulation recovery areas for this subbasin will include the Sherman/East Fork Sherman Creek drainages, Fourth Boulder/Third Boulder Creek drainages, Second Boulder/First Boulder Creek drainages, Cold Creek complex drainages, and Conrad/Talbot Creek drainages (Map 4). The major recovery actions for this area include:

Habitat Management

As of the latest surveys, five of the recovery streams in this area are known to be in good condition, while both forks of Sherman Creek were rated as being in poor condition. Habitat management and monitoring will remain a high priority.

Fish Population Monitoring

The latest surveys show reduced LCT populations in most recovery streams in this area. As resources allow, populations in the area will continue to be monitored until viable population levels have been reached. The recently introduced LCT population in John Day Creek will be monitored every three years, until a viable population has become established.

Fish Population Management

Four of the six recovery streams (Fourth Boulder, Second Boulder, North Fork Cold, and Conrad Creeks), and all of the potential recovery streams (with the exception of John Day Creek) will need to be evaluated for possible treatment of brook trout populations and reintroduction of LCT. Highest priority will be given to streams in which non-native trout are the greatest threat to the current LCT population. Streams that contain barriers separating LCT populations from non-native trout populations will need to be thoroughly evaluated before stream treatment projects are recommended.

Augmenting LCT Populations

Several projects involving the transplant of LCT into barren reaches of streams above barriers have been unsuccessful in this area. These projects should be evaluated before more are carried out. The recently introduced LCT population in John Day Creek should be augmented at the earliest opportunity due to the low number of LCT (29) that were first introduced. This project was scheduled for 1998, but was canceled due to the low donor population in North Fork Cold Creek.

Genetic Evaluations

Four of the six LCT populations in this area have not had genetic evaluations (Appendix E). Evaluation priority will be based on the LCT populations' proximity to non-native trout populations and historic stocking records. Genetic analysis of the LCT population in North Fork Cold Creek will be a high priority as it is the donor population for John Day Creek.

Fish Barriers

There may be potential for man-made fish barriers in streams of this area to protect LCT occupied habitat from the establishment of non-native trout and allow for the expansion and connection of LCT populations. Streams with this potential will be thoroughly evaluated by NDOW, the appropriate land management agency, and the DPS Team.

SOUTH FORK HUMBOLDT RIVER SUBBASIN

In terms of reaching recovery objectives, streams in this subbasin will provide the most difficulty. Recovery actions in this subbasin will have a high priority in order to preserve the remaining LCT populations. Although most streams in this subbasin are not connected, there is some potential for metapopulations in several watersheds. Again, several fish barriers and treatments will need to be completed before any connections can be made. This process has been started in the Green Mountain Creek watershed, with the construction of a temporary fish barrier and the treatment of the headwaters. The priority metapopulation recovery areas for this subbasin will include the Green Mountain complex/Toyn Creek drainages, Smith Creek complex drainages, and North Furlong/Mahogany/Long/Segunda Creek drainages (Map 5). The major recovery actions for this subbasin include:

Habitat Management

As of the latest surveys, 11 of the 20 recovery streams in this subbasin are known to be in good condition. A majority of these habitat surveys were conducted before 1985 and should be reexamined in the near future. Habitat management and monitoring will remain a high priority.

Fish Population Monitoring

The latest fish population surveys have shown declining LCT populations in most streams of this subbasin. Several streams had no LCT and these populations may have been lost. A majority of the populations in this subbasin will continue to be monitored every five years until viable population levels have been reached.

Fish Population Management

A total of 13 of the 20 recovery streams in this subbasin are known to contain non-native trout (brook and rainbow) and will need to be evaluated for possible treatment/reintroduction projects. All of the potential recovery streams are also known to contain brook trout. Highest priority will be given to streams in which non-native trout are the greatest threat to the current LCT population. Barriers (agricultural diversions) located on private and tribal lands on the upper South Fork Humboldt River will need to be evaluated as to their effectiveness at isolating the non-native trout populations in the lower river. All recovery streams will need to be thoroughly evaluated before stream treatment projects are recommended. Recovery streams that offer the greatest protection from non-native trout may need to be treated first to provide a refugium for LCT taken from the most threatened populations. This refugium would then be used for future reintroductions after recovery actions have been implemented.

Augmenting LCT Populations

As some of the stream systems in this subbasin are very large, augmenting LCT populations in suitable habitat may be needed. Recovery streams that have recently lost LCT populations and barren reaches of streams above barriers will need to be evaluated for possible augmentation or reintroduction. LCT will be moved into streams only after habitat and fish population surveys have determined that the areas are suitable.

Genetic Evaluations

Eight of the 20 LCT populations in this subbasin have not had genetic evaluations (Appendix E). Evaluation priority will be based on the LCT populations' proximity to non-native trout populations and historic stocking records. LCT populations scheduled to be used as donors for reintroduction projects will also need to have genetic evaluations completed.

Fish Barriers

There is potential for man-made fish barriers in streams of this subbasin to protect LCT occupied areas from the establishment of non-native trout. This is especially true in some of the larger systems of this subbasin where eradication success may be in doubt. Streams with this potential will be thoroughly evaluated by NDOW, the appropriate land management agency, and the DPS Team.

Hatchery Propagation

This subbasin may have some potential for some form of hatchery propagation of LCT. Evaluations will be made to assess whether a program of this type would be feasible and economical in assisting with recovery efforts.

MAGGIE CREEK SUBBASIN

Recent improvements in riparian habitat management have greatly enhanced LCT recovery efforts in this subbasin. Although most of the streams in this subbasin are not connected during a majority of the year, recent surveys have shown that some larger LCT from Maggie Creek are utilizing the spring runoff period to access the smaller tributaries. Removal of road culverts and an irrigation diversion that fragment habitat will improve the connectivity of Beaver Creek and the upper portion of Maggie Creek. Improvement in habitat in the lower reaches of all tributaries may also improve the metapopulation potential of this subbasin. The priority metapopulation recovery area for this subbasin will include all streams located upstream of the Soap Creek confluence with Maggie Creek (Map 6). The major recovery actions for this subbasin include:

Habitat Management

As of the latest surveys, two recovery streams (Little Beaver Creek and Williams Canyon Creek) and two potential recovery streams (Jack Creek and Susie Creek) have been found to have a poor habitat condition rating. However, habitat condition trend is up in all streams except for Williams Canyon Creek and Susie Creek. All other streams in the subbasin have habitat conditions ranging from fair to excellent. Habitat management and monitoring (including monitoring mine dewatering activities) will be the major recovery action in this subbasin.

Fish Population Monitoring

Latest surveys show stable to increasing LCT populations in many of the tributaries to Maggie Creek, but not in Maggie Creek itself. As resources allow, LCT populations in this subbasin will continue to be monitored until viable population levels have been reached.

Fish Population Management

Spring Creek is the only stream in this subbasin that has been known to contain brook trout. This population may be gone however, and a treatment project may not be needed (AATA International, Inc. 1997). The possible reintroduction of LCT into Susie Creek will be evaluated when habitat conditions improve to suitable levels.

Genetic Evaluations

Six LCT populations within this subbasin have not had genetic evaluations to determine purity (Appendix E). Three of these streams (Williams Canyon, Toro Canyon, and Little Beaver Creeks) are headwater tributaries to Beaver Creek and will have a lower priority. Evaluation priority will be based on the LCT populations' proximity to non-native trout populations and historic stocking records. LCT populations scheduled to be used as donors for reintroduction projects will also need to have genetic evaluations completed.

Fish Barriers

There is the potential need for a man-made fish barrier on Maggie Creek above its confluence with the Humboldt River. This will need to be thoroughly evaluated by the NDOW, BLM, and private landowners.

ROCK CREEK SUBBASIN

Changes in habitat management on some of the headwater streams of this subbasin should lead to improved LCT habitat and populations. Improving habitat in the upper tributaries of Rock Creek and Willow Creek could increase the metapopulation potential of this subbasin. The priority metapopulation recovery areas for this subbasin will include Rock Creek and all tributaries upstream of the Toe Jam Creek confluence and Willow Creek and all tributaries upstream of Willow Creek Reservoir (Map 7). The major recovery actions for this subbasin include:

Habitat Management

Habitat condition trend is static to upward for all recovery streams in this subbasin, with the exception of Upper Willow Creek and Trout Creek. Improvement of habitat conditions on Upper Willow Creek (above Willow Creek Reservoir) will be needed to promote the metapopulation potential of this portion of the system. Habitat management and monitoring will be the major recovery action in this subbasin.

Fish Population Monitoring

The latest fish population surveys have shown declining LCT populations in all streams of this subbasin except Frazier Creek and Toe Jam Creek. These populations will continue to be monitored every five years until viable population levels are reached.

Fish Population Management

Upper Willow Creek and Trout Creek will be recommended for reintroduction of LCT when habitat conditions are considered suitable. A majority of these streams are privately

owned, and a private landowner agreement will be needed before the reintroduction process begins.

Genetic Evaluations

Lewis Creek and Upper Willow Creek are the only two recovery streams in this subbasin that have not had genetic evaluations (Appendix E). At this time, Lewis Creek has the only resident LCT population of the two streams, and will be given priority.

REESE RIVER SUBBASIN

Recovery actions in this subbasin will have a high priority in order to preserve the remaining LCT populations. Although none of the streams in this subbasin are connected, there is some possibility for metapopulation potential in the Cottonwood/San Juan Creeks and upper Reese River watersheds. In late 2003, a temporary fish barrier was constructed on Cottonwood Creek to begin the process of establishing a metapopulation in this watershed. The priority metapopulation recovery areas for this subbasin will include the Cottonwood/San Juan complex drainages and the Tierney Creek complex drainages (Map 8). The major recovery actions for this subbasin include:

Habitat Management

Latest surveys show that six of the nine recovery streams in this subbasin are known to be in good condition. Nearly all of these habitat surveys occurred during 1990 and 1991, and should be reexamined in the near future. Habitat management and monitoring will remain a high priority.

Fish Population Monitoring

The latest fish population surveys have shown declining LCT populations in most streams of this subbasin. Several streams (Crane Canyon, North Fork Stewart, Middle Fork Stewart, Stewart, Cottonwood, and Marysville Creeks) had no LCT or very small populations, and there is a very real potential for these to be lost. All populations in this subbasin will continue to be monitored every five years until viable population levels are reached.

Fish Population Management

Washington Creek, Crane Canyon Creek, and Mohawk Creek are the only streams in this subbasin that do not contain populations of brook and rainbow trout. All others will need to be evaluated for possible treatment/reintroduction projects. Highest priority will be given to streams in which non-native trout are the greatest threat to the current LCT population and where metapopulation potential is highest. Thorough evaluations will be needed before stream treatment projects are recommended. Physical removal of non-

native trout populations that pose a significant threat to LCT populations may need to be undertaken during these evaluation periods. Corral Creek, a barren potential recovery stream, may have the potential of providing a refugium for LCT taken from the most threatened populations. This refugium could then be used for future reintroductions after recovery actions have been implemented.

Augmenting LCT Populations

Recovery streams that have recently lost LCT populations and barren reaches of streams above barriers will need to be evaluated for possible augmentation or reintroduction. LCT will be moved into streams only after habitat and fish population surveys have determined that the area is suitable.

Angler Use and Harvest Monitoring

Recovery streams within this subbasin have the highest angler use in the Upper Humboldt Basin. Angler use and harvest should be monitored to evaluate potential impacts to LCT populations. If LCT populations are being negatively impacted, restrictive regulations will need to be recommended.

Fish Stocking Evaluation

The stocking of non-native trout into San Juan Creek, which is a tributary of Cottonwood Creek (an LCT recovery stream), was discontinued in 1999. The non-native trout populations and LCT populations were separated by barriers at one time, but no barriers could be found during the 1999 fish population survey.

Genetic Evaluations

The LCT population in Cottonwood Creek may need to be analyzed further to determine the extent and range of the hybridized trout found in 2000. With the exception of Mohawk Creek, all other LCT populations within this subbasin have had genetic evaluations. Genetic analysis of all populations within the subbasin will continue on a periodic basis.

Fish Barriers

There is a potential for man-made fish barriers in streams of this subbasin to protect LCT occupied areas from the establishment of non-native trout. Many of these LCT populations have been relegated to remote headwater reaches of streams due to the encroachment of non-native trout on their habitat. Temporary and permanent fish barriers will be used to improve the potential for success of stream treatments in large watersheds. Streams with the potential for man-made fish barriers will be thoroughly evaluated by NDOW, the appropriate land management agency, and the DPS Team.

SOUTH FORK LITTLE HUMBOLDT RIVER AREA

Proposed changes in habitat management on the headwater streams of the South Fork Little Humboldt River should lead to improved LCT habitat and populations (See Attachment 1, Page 8). The metapopulation potential for streams in this area is very good, as most are connected throughout the year. Improvements in habitat could increase the metapopulation potential of this subbasin. The priority metapopulation recovery area for this subbasin will include the South Fork Little Humboldt River and all tributaries upstream of the First Creek confluence (Map 9). The major recovery actions for this subbasin include:

Habitat Management

As of the latest surveys, only a portion of one of the four recovery streams in this subbasin is known to be in good condition. This portion is on the South Fork Little Humboldt River between Pole Creek and Rodear Flat. In 1997, the lower portions of First Creek and Winters Creek, potential recovery streams, were also found to be in good condition. Habitat management and monitoring will be the major recovery action in this subbasin.

Fish Population Monitoring

The most recent fish population surveys have shown stable to increasing LCT populations in the recovery streams of this subbasin. Three other streams (First, Winters, and Snowstorm Creeks) with small populations of LCT were also found during these surveys, and LCT have been observed in another stream (Oregon Canyon Creek). The populations in this subbasin will continue to be monitored as needed until viable population levels have been reached.

Augmenting LCT Populations

Recovery streams that have barren reaches above barriers will need to be evaluated for possible augmentation or reintroduction. Three potential recovery streams were discovered during the most recent population surveys. Two of these streams (First Creek and Winters Creek) may need to have LCT populations augmented in the upper portions when habitat conditions are considered acceptable. LCT will be moved into streams only after habitat and fish population surveys have determined that the area is suitable.

Genetic Evaluations

The only LCT populations in this subbasin that have not had genetic evaluations are those that were just recently discovered (First, Winters, and Snowstorm Creeks). Genetic analysis of all streams within this subbasin will continue on a periodic basis.

PINE CREEK SUBBASIN

As none of the streams in this subbasin are connected, the potential for a metapopulation is very low. The only two LCT populations currently within the subbasin originated from other sources. The Pete Hanson Creek population was founded with LCT from Shoshone Creek (Big Smokey Valley Drainage), while phylogenetic analysis of the Birch Creek LCT population found that they are most closely related to LCT from the East Carson River. The major recovery actions for this subbasin include:

Habitat Management

As of the latest surveys, none of the recovery streams in this subbasin are known to be in good condition. Habitat management and monitoring will be the major recovery action in this subbasin.

Fish Population Monitoring

The latest fish population surveys have shown strong LCT populations in the recovery streams of this subbasin. These populations will continue to be monitored every five years until it is deemed that viable population levels have been reached.

Fish Population Management

Trout Creek, Vinini Creek, and Henderson Creek are known to contain non-native trout (brook trout and rainbow trout). A thorough evaluation of this stream and the possible donor population will be needed before a stream treatment project is recommended.

INTERIOR NEVADA BASINS

The major recovery actions for these streams include:

Habitat Management

Latest surveys show that six of the streams (Sante Fe, Shoshone, West Fork Deer (within the exclosures, upward trend outside the exclosures), North Fork Pine, Mosquito, and Decker Creeks) in this area are known to be in good condition. Only three of the eight streams in the interior basins have had habitat surveys in the 1990's, and the rest should be reexamined in the near future. Habitat management and monitoring will remain a high priority.

Fish Population Monitoring

The latest fish population surveys show LCT populations surviving in seven of these streams. In West Fork Deer Creek, the populations decreased or were lost. All populations in this subbasin will be monitored as time permits until viable population levels have been reached.

Fish Population Management

Six of the streams (Mosquito, West Fork Deer, North Fork Pine, Decker, Moores, and South Fork Thompson Creeks) in Interior Nevada Basins contain populations of brook, rainbow, and brown trout. As these populations are out of the historic LCT range, they will be given lowest priority for possible treatment/reintroduction projects. Thorough evaluations will be needed before stream treatment projects are recommended.

Augmenting LCT Populations

Interior Nevada Basin streams that have recently lost LCT populations or have barren reaches of streams above barriers will need to be evaluated for possible augmentation or reintroduction. LCT will be moved into streams only after habitat and fish population surveys have determined that the area is suitable.

Angler Use and Harvest Monitoring

Two of the streams (Mosquito Creek and the mainstem of Pine Creek) in Interior Nevada Basins have high angler use. Angler use and harvest should be monitored to evaluate potential impacts to LCT populations. If LCT populations are being negatively impacted, restrictive regulations will need to be recommended.

Fish Stocking Evaluation

Mosquito Creek and Pine Creek are currently stocked with non-native trout. The non-native trout populations and LCT populations are separated by barriers, but future stocking of these streams will need to be evaluated based on the security of the LCT habitat. If negative impacts are found, the stocking program will be discontinued.

Genetic Evaluations

One LCT population (Shoshone Creek) in the Interior Nevada Basins has been genetically evaluated (Appendix C). Phylogenetic analysis of the Sante Fe Creek population found that they were most closely related to remnant LCT populations in the Reese River Subbasin, and could be used as a donor population for reintroductions in that subbasin. All other Interior Basin LCT populations were introduced from genetically pure populations in the Upper Humboldt Basin.

Fish Barriers

There may be potential for man-made fish barriers in these streams to protect LCT occupied areas from the establishment of non-native trout. Streams with this potential will be thoroughly evaluated by NDOW, the appropriate land management agency, and the DPS Team.

IMPLEMENTATION SCHEDULE

Upon approval of the Upper Humboldt Plan by the Fisheries Biologist Supervisor, Fisheries Bureau Chief, and the Director of the Nevada Department of Wildlife, implementation of recovery actions on high priority streams will begin. Public scoping of the Draft Upper Humboldt Plan will be accomplished in accordance with State of Nevada Board of Wildlife Commissioners Policy Number P-33 and NDOW Fisheries Bureau Program and Procedure for Fisheries and Species Management Planning. The Fisheries Bureau Program and Procedure directs that "Public scoping for species management plans will be conducted in communities within the greater range of the species. It is advisable to employ the County Advisory Board to Manage Wildlife system as the public medium for this scoping process". To facilitate this process, the Draft Upper Humboldt Plan will be provided to the County Advisory Boards and presentations will be made upon request. The following implementation schedule will be based on recovery actions to be completed on a yearly basis, and will need to be flexible in the future to allow for available funding and an increase in the number of LCT populations to be monitored (Appendix F). Recovery actions to be conducted include:

1. Population monitoring on LCT streams will be conducted yearly. The priority in which streams are surveyed will be based on the dates of the prior surveys, i.e. streams with the oldest population data will be completed first, and on populations of concern, i.e. streams in which no LCT were found in the latest surveys. Any stream that has a reintroduced population of LCT will also be given priority.

2. Upon approval of the plan, streams will be proposed on a yearly basis for possible treatment. On these streams, habitat, fish population, and other surveys will be conducted. If needed, temporary and/or permanent fish migration barriers will be constructed and functioning prior to any treatments. The selection process for stream treatments will be coordinated with other agencies and interested publics during the annual LCT Interagency Coordination Meeting and Distinct Population Segment Recovery Team Meetings. The following year, one or two of these streams will be treated.

3. Reintroductions of LCT into treated streams will commence immediately after treatment success has been evaluated. In some cases this may be done the year following the treatment, but most will be done two years after treatment. During population monitoring, recovery streams with suitable barren habitat will be identified for LCT augmentations. Upon approval, augmentations could be carried out on a yearly basis during normal monitoring activities.

4. Other recovery actions will be prioritized and conducted on an as needed basis. These actions may not be conducted on a yearly basis, but will need to be completed in order to satisfy recovery objectives.

5. The Upper Humboldt Plan should be revised after a 10-year period.

GLOSSARY

Augmentation: The act of supplementing existing wild populations where it is determined that a population is below habitat carrying capacity (NDOW Fish Stocking Guidelines).

Fish/Mile: Determined by: (Number of fish caught in the transect) X (5280 feet/length of the transect in feet). Example: 15 fish caught in a 100 foot transect. 15 X (5280/100) = 792 fish per mile. Fish/mile figures given for a stream are an average of all transects.

GAWS: General Aquatic Wildlife System transect methodology. Streams are divided into "reaches" based on channel types (Rosgen 1985), with the number of survey stations assigned to each reach depending upon the length of the reach. At least two survey stations are assigned to each reach. At each survey station, numerous variables are measured and rated at five transects spaced at 50 foot intervals. These measurements and ratings are then used to determine percent of optimum Pool Structure, Pool Measure, Bank Soil Stability, Bank Vegetation Stability, Substrate, and Bank Cover (USDA Forest Service 1989).

Aquatic Habitat Condition Rating: Bureau of Land Management administered lands - 70+=Excellent, 60-69=Good, 50-59=Fair, 0-49=Poor. U.S. Forest Service administered lands - 90+=Excellent, 70-89=Good, 40-69=Fair, 0-39=Poor.

Conservation Population - A reproducing and recruiting population of LCT that is geographically isolated and is managed to sustain the long-term persistence of the LCT subspecies. Conservation populations are managed with the intention of preserving unique ecological and behavioral characteristics within specific populations and geographic units.

Metapopulation: A population comprised of a set of populations that are linked by migration, allowing for the recolonization of unoccupied habitat after local extinction events (USFWS Recovery Plan).

MicroFish: A computer software system that processes electrofishing data obtained by the removal (multiple pass) method (Van Deventer and Platts 1989).

Reintroduction: The act of releasing native species into habitats formerly occupied by that species for the purpose of creating self-sustaining populations in a wild environment.

Mitochondrial DNA (mtDNA): DNA housed within the mitochondria. All mtDNA molecules are inherited from the mother and they are identical within an individual, though they may vary among individuals. Mitochondrial DNA molecules are smaller than nuclear DNA molecules and easier to analyze; they also mutate more readily, facilitating diagnosis of individuals and species (Behnke 1992).

Protein electrophoresis: Involves separating and identifying enzymes. Variation in the identified proteins represents the phenotypic expression of alternative alleles for single structural genes. Unique alleles, called variants, provide readily identifiable markers which permit the assessment of the genetic influence of stocked fish upon native populations (Gall and Loudenslager 1981).

Riparian Condition Class: The average of percent optimum bank cover and percent optimum bank stability.

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Lahontan Cutthroat Trout Status

Marys River Subbasin

	POPULATION	OCCUPIED	POTENTIAL	ESTIMATED	NON-NATIVE	NONGAME
STREAM	SURVEY YEAR	MILES	MILES	POPULATION SIZE	TROUT POPULATIONS	FISH SPECIES
Short Creek	2002	0	0.5	*0-100	None	None
**T Creek	FS 2002	4	4	500-1000	None	SD, PS
	BLM 1999,2002	3	15	1000-2000	BK	SD, PS, TS, RS
Anderson Creek	See T Creek, BLM portion.					
Basin Creek	1997	1	1.5	100-500	None	PS
GAWS Creek	1997	0.5	0.5	0-100	None	None
**West Fork Marys River	2002	4	4	1000-5000	None	PS
**East Fork Marys River	2002	3.5	4	1000-2000	None	PS, RS
**Marys River Basin Creek	2002	3	3	500-1000	BK?	PS
Williams Basin Creek	1998	0.5	0.5	0-100	None	None
Camp Draw Creek	1998	0.5	0.5	100-500	None	None
Marys River	FS 1998	8	8	500-1000	BK?	SD, PS, RS, MS
	BLM (1998), 2003	(19), 0	87.5	(100-500), *0-100	BK?	SD,PS,RS,MS,TS,TC
Wildcat Creek	FS 2002	0.5	2.5	0-100	None	None
	BLM 2002	1.5	2	100-500	None	SD
Hanks Creek	2000	5	17	100-500	None	SD, RS, TS, MS
Chimney Creek	2000	0.5	3.5	100-500	None	None
Conners Creek	2000	0	7	*0-100	None	SD
Draw Creek	FS 2003	0.5	3	100-500	None	SD
	BLM 2003	0	2	*0-100	None	SD
Cutt Creek	2000	0	3	*0-100	None	SD
POTENTIAL SITES						
Currant Creek	1998	0	11	*0-100	BK, RB	SD, PS

* - No Lahontan cutthroat trout found in latest survey.

** - Data collected by University of Nevada Reno.

Estimated population figures do not include young-of-year.

Non-native Trout: BK - brook trout, BN - brown trout, RB - rainbow trout.

Nongame Fish: SD - speckled dace, RS - redside shiner, TS - Tahoe sucker, MS - mountain sucker, PS - Paiute sculpin, TC - tui chub.

Lahontan Cutthroat Trout Status

North Fork Humboldt River Subbasin

STREAM	POPULATION SURVEY YEAR	OCCUPIED MILES	POTENTIAL MILES	ESTIMATED POPULATION SIZE	NON-NATIVE TROUT POPULATIONS	NONGAME FISH SPECIES
Warm Creek	2003	0	1.5	*0-100	None	None
Road Canyon Creek	2003	2	2.5	100-500	None	None
Winters Creek	1997	0.5	3?	0-100	None	None
Mahala Creek	FS 2000	0	2	*0-100	None	SD
	BLM 2000	0	1	*0-100	None	SD
**Foreman Creek	2002	2	13	2000-5000	None	None
Gance Creek	**FS 2002	2.5	3	100-500	None	SD
	BLM 1997	2	2.5	100-500	None	SD, RS, TS, PS
Cole Canyon Creek	2002	0	2	*0-100	BK?	PS?
Jim Creek	FS 2002	0	2	*0-100	None	SD
	BLM 2002	0	1	*0-100	None	None
Dorsey Creek	1998	0	2.5	*0-100	RB	SD
Pie Creek	1998	0	5	*0-100	None	SD, RS, TS
North Fork Humboldt River	FS 1999-Chadwick	4	4	2000-5000	BK	SD, PS
	BLM 1998-99	1	21	0-100	BK	SD, RS, TS, MS
California Creek	2002	0.5	2	0-100	None	SD
POTENTIAL SITES						
Pratt Creek	1999	0	9	*0-100	BK	None
E. Fork Beaver Creek	1985	0	18.5	*0-100	None	SD, RS, TS
W. Fork Beaver Creek	1985	0	13	*0-100	None	SD, RS, TS
Beaver Creek	1985	0	3.5	*0-100	None	SD, RS, TS

* - No Lahontan cutthroat trout found in latest survey.

** - Data collected by University of Nevada Reno.

Estimated population figures do not include young-of-year.

Non-native Trout: BK - brook trout, BN - brown trout, RB - rainbow trout.

Nongame Fish: SD - speckled dace, RS - redside shiner, TS - Tahoe sucker, MS - mountain sucker, PS - Paiute sculpin, TC - tui chub.

LAHONTAN CUTTHROAT SPECIES MANAGEMENT PLAN

Lahontan Cutthroat Trout Status

East Humboldt River Area

STREAM	POPULATION SURVEY YEAR	OCCUPIED MILES	POTENTIAL MILES	ESTIMATED POPULATION SIZE	NON-NATIVE TROUT POPULATIONS	NONGAME FISH SPECIES
Fourth Boulder Creek	2001	1.5	2.5	100-500	BK	None
Second Boulder Creek	2001	1	1	100-500	BK	None
Sherman Creek	2003	0.5	5	0-100	None	SD
E. Fork Sherman Creek	2003	0.5	3.5	0-100	None	None
N. Fork Cold Creek	1998	1	5	0-100	BK	None
Conrad Creek	2001	0	5	*0-100	BK	None
POTENTIAL SITES						
John Day Creek	1998	0	1.5	0-100	None	None
First Boulder	1984	0	2	*0-100	BK	None
Third Boulder	1984	0	4.5	*0-100	BK	None
Cold Creek	1983	0	1.5	*0-100	BK	None
M. Fork Cold Creek	1983	0	2.5	*0-100	BK	None
S. Fork Cold Creek	1981	0	0.5	*0-100	BK	None
Talbot Creek	1983	0	2	*0-100	BK	None

* - No Lahontan cutthroat trout found in latest survey.

Estimated population figures do not include young-of-year.

Non-native Trout: BK - brook trout, BN - brown trout, RB - rainbow trout.

Nongame Fish: SD - speckled dace, RS - redside shiner, TS - Tahoe sucker, MS - mountain sucker, PS - Paiute sculpin, TC - tui chub.

South Fork Humboldt River Subbasin

STREAM	POPULATION SURVEY YEAR	OCCUPIED MILES	POTENTIAL MILES	ESTIMATED POPULATION SIZE	NON-NATIVE TROUT POPULATIONS	NONGAME FISH SPECIES
Gennette Creek	1999	2.5	3	100-500	BK	None
Carville Creek	2000	1	2.5	100-500	None	None
Mitchell Creek	FS 1998	0	1.5	*0-100	None	None
	BLM 1998	0	4	*0-100	None	MS, TS, SD
N.F. Mitchell Creek	1998	0	1	*0-100	None	None
Green Mountain	2001	0	1	*0-100	BK	None
N.F. Green Mountain Creek	2001	0.5	5	0-100	BK	None
Pearl Creek	FS 2001	3	5	1000-2000	BK	None
	BLM 2001	1	1.5	100-500	None	None
North Furlong Creek	2003	5	5.5	1000-2000	BK	None
Mahogany Creek	2000	1	4	0-100	BK	None
Lee Creek	1998	1	1.5	100-500	None	None
Welch Creek	1999	0.5	2	0-100	None	None
Dixie Creek	2000	5	14	100-500	None	SD, MS
Smith Creek	1999	2	2	100-500	BK	PS
N. F. Smith Creek	1999	1.5	3	100-500	BK	None
M. F. Smith Creek	1999	2	2	100-500	BK	PS
McCutcheon Creek	1999	0.5	2.5	0-100	BK	None
Segunda Creek	2000	2	3	100-500	BK, HYB	None
Long Canyon Creek	2000	1	9.5	0-100	BK, HYB	PS
Rattlesnake Creek	2000	0	5	*0-100	BK	None
Cottonwood Creek	2000	0	2	*0-100	None	None
POTENTIAL SITES						
Brown Creek	1998	0	3.5	*0-100	BK	None
Box Canyon Creek	1985	0	5	*0-100	BK	None
S.F. Smith Creek	1979	0	1	*0-100	BK?	None
S.F. Green Mountain Creek	2001	0	5	*0-100	BK	None
Toyn Creek	2003	0	7	*0-100	BK	None
Corral Creek	2003	0	4+	*0-100	BK	None

* - No Lahontan cutthroat trout found in latest survey.

Estimated population figures do not include young-of-year.

Non-native Trout: BK - brook trout, BN - brown trout, RB - rainbow trout, HYB - hybrid trout (LCT x rainbow).

Nongame Fish: SD - speckled dace, RS - redside shiner, TS - Tahoe sucker, MS - mountain sucker, PS - Paiute sculpin, TC - tui chub.

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN

Lahontan Cutthroat Trout Status

Maggie Creek Subbasin

STREAM	POPULATION SURVEY YEAR	OCCUPIED MILES	POTENTIAL MILES	ESTIMATED POPULATION SIZE	NON-NATIVE TROUT POPULATIONS	NONGAME FISH SPECIES
Coyote Creek	1999	6.5	18	1000-5000	None	SD
Little Jack Creek	2001	3.5	10	1000-2000	None	SD
Maggie Creek	1997	1	22	0-100	None	SD,RS,TS,MS
Williams Canyon Creek	2000	0	4	*0-100	None	None
Little Beaver Creek	2000	3	5	1000-2000	None	None
Beaver Creek	2000	8	12	1000-2000	None	SD, TS, MS
Toro Canyon Creek	2000	6	6	2000-6000	None	SD
Lone Mountain Creek	2000	<0.5	<3	100-500**	None	None
POTENTIAL SITES						
Spring Creek	1996	0	5	*0-100	None	SD
Jack Creek	2001	0	5	*0-100	None	SD
Susie Creek	1989	0	7	*0-100	None	SD, RS, TS

* - No Lahontan cutthroat trout found in latest survey.

** - Newly discovered population of LCT, spotshock data only.

Estimated population figures do not include young-of-year.

Non-native Trout: BK - brook trout, BN - brown trout, RB - rainbow trout.

Nongame Fish: SD - speckled dace, RS - redside shiner, TS - Tahoe sucker, MS - mountain sucker, PS - Paiute sculpin, TC - tui chub.

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN

Lahontan Cutthroat Trout Status

Rock Creek Subbasin

STREAM	POPULATION SURVEY YEAR	OCCUPIED MILES	POTENTIAL MILES	ESTIMATED POPULATION SIZE	NON-NATIVE TROUT POPULATIONS	NONGAME FISH SPECIES
Upper Willow Creek	2001	0.5	10	0-100	None	SD, RS, TS, MS
Upper Rock Creek	2001	2	10	1000-2000	None	SD, RS, TS
Toe Jam Creek	2002	12	14	500-1000	None	SD, MS
**Frazier Creek	2002	2	4	500-1000	None	SD
Lewis Creek	2001	1	4	0-100	None	SD
Nelson Creek	2001	3	5	100-500	None	SD, RS, TS
POTENTIAL SITES						
Willow Creek Reservoir	-	-	-	Low	Warmwater Gamefish	SD, RS, TS, MS
Lower Willow Creek	2001	0	1	*0-100	None	SD, RS, TS
Trout Creek	1993	0	4.5	*0-100	None	SD, TS

* - No Lahontan cutthroat trout found in latest survey.

** - Data collected by University of Nevada Reno.

Estimated population figures do not include young-of-year.

Warmwater Gamefish: white crappie, channel catfish, white catfish, largemouth bass.

Nongame Fish: SD - speckled dace, RS - redside shiner, TS - Tahoe sucker, MS - mountain sucker, PS - Paiute sculpin, TC - tui chub.

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN

Lahontan Cutthroat Trout Status

Reese River Subbasin

STREAM	POPULATION SURVEY YEAR	OCCUPIED MILES	POTENTIAL MILES	ESTIMATED POPULATION SIZE	NON-NATIVE TROUT POPULATIONS	NONGAME FISH SPECIES
Washington Creek	1997	4	5	1000-2000	None	None
Crane Canyon Creek	2001	1	5	100-500	None	None
Stewart Creek	1999	0	5.5	*0-100	BK, BN	None
North Fork Stewart Creek	1999	0.5	2	0-100	BK	None
Middle Fork Stewart Creek	1999	0.5	0.5	0-100	BK	None
Cottonwood Creek	2001	0.5	8	0-100	BK, BN, RB, HYB	None
Mohawk Creek	1990	3.5	7	100-500	None	None
Marysville Creek	1999	0.5	5	0-100	BK	None
Tierney Creek	2002	2	7	100-500	BK	None
POTENTIAL SITES						
Corral Creek (Big Cr.)	1998	0	1	*0-100	None	None
Big Sawmill Creek	2000	0	4.5	*0-100	BK, RB, BN	None
San Juan Creek	2001	0	11	*0-100	BK, RB, BN	None
Illinois Creek	1999	0	6	*0-100	RB, BK	None

* - No Lahontan cutthroat trout found in latest survey.

Estimated population figures do not include young-of-year.

Non-native Trout: BK - brook trout, BN - brown trout, RB - rainbow trout, HYB - hybrid trout (LCT x rainbow).

Nongame Fish: SD - speckled dace, RS - redside shiner, TS - Tahoe sucker, MS - mountain sucker, PS - Paiute sculpin, TC - tui chub.

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN

Lahontan Cutthroat Trout Status

South Fork Little Humboldt River Area

STREAM	POPULATION SURVEY YEAR	OCCUPIED MILES	POTENTIAL MILES	ESTIMATED POPULATION SIZE	NON-NATIVE TROUT POPULATIONS	NONGAME FISH SPECIES
Sheep Creek	2001	1	3	100-500	None	None
Secret Creek	2001	1.5	2.5	100-500	None	None
Pole Creek	1997	3	4.5	1000-2000	None	None
S.F. Little Humboldt (*WSA)	1998	11	11.5	1000-2000	None	SD, RS, MS
S.F. Little Humboldt (Elko Co.)	2001	6	7	1000-2000	None	None
POTENTIAL SITES						
First Creek	1997	0.5	5	0-100	None	None
Snowstorm Creek	1997	4.5	6	500-1000	None	None
Winters Creek	1997	0.5	1	0-100	None	None
Oregon Canyon Creek	-	<0.5	1	LCT Observed	None	None

Estimated population figures do not include young-of-year.

Nongame Fish: SD - speckled dace, RS - redside shiner, TS - Tahoe sucker, MS - mountain sucker, PS - Paiute sculpin, TC - tui chub.

*-Wilderness Study Area in Humboldt County

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN

Lahontan Cutthroat Trout Status

Pine Creek Subbasin

STREAM	POPULATION SURVEY YEAR	OCCUPIED MILES	POTENTIAL MILES	ESTIMATED POPULATION SIZE	NON-NATIVE TROUT POPULATIONS	NONGAME FISH SPECIES
*Pete Hanson Creek	2003	3.5	3.5	2000-4000	None	None
Birch Creek	2003	1.5	2	100-500	None	None
POTENTIAL SITES						
Henderson Creek	1984	0	?	**0-100	RB	SD
Trout Creek	1984	0	7.5	**0-100	RB, BK, HYB	SD
Vinini Creek	1984	0	?	**0-100	RB	SD

* - Introduced LCT population.

** - No LCT found in latest surveys.

Estimated population figures do not include young-of-year.

Non-native Trout: BK - brook trout, BN - brown trout, RB - rainbow trout, HYB - hybrid trout (LCT x rainbow).

Nongame Fish: SD - speckled dace, RS - redside shiner, TS - Tahoe sucker, MS - mountain sucker, PS - Paiute sculpin, TC - tui chub.

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN

Lahontan Cutthroat Trout Status

Interior Nevada Basins

STREAM	POPULATION SURVEY YEAR	OCCUPIED MILES	POTENTIAL MILES	ESTIMATED POPULATION SIZE	NON-NATIVE TROUT POPULATIONS	NONGAME FISH SPECIES
Mosquito Creek	1996	2	6	100-500	BN, HYB?, RB	None
Sante Fe Creek	1997	1	2	1000-2000	None	None
Shoshone Creek	1997	1.5	1.5	500-1000	None	None
West Fork Deer Creek	1996	0	2.5	*0-100	BK	None
North Fork Pine Creek	2000	0.5	1.5	0-100	BK, BN	None
South Fork Thompson Creek	2000	1	2.5	100-500	BK	None
Decker Creek	2000	0.5	1	100-500	BN	None
Moores Creek	1995	7	7	100-500	BK, BN	None

* - No LCT found in latest surveys.

Estimated population figures do not include young-of-year.

Non-native Trout: BK - brook trout, BN - brown trout, RB - rainbow trout, HYB - hybrid trout (LCT x rainbow).

Nongame Fish: SD - speckled dace, RS - redside shiner, TS - Tahoe sucker, MS - mountain sucker, PS - Paiute sculpin, TC - tui chub.

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Angler Questionnaire 1993-2002 Average

Marys River Subbasin

STREAM	ANGLERS	DAYS	YEARS REPORTED
Marys River	96	148	10
Anderson Creek	-	-	None reported.
Camp Draw Creek	-	-	None reported.
Chimney Creek	-	-	None reported.
Conners Creek	-	-	None reported.
Cutt Creek	-	-	None reported.
Draw Creek	-	-	None reported.
E.F. Marys River	-	-	None reported-Included in "Marys River".
Hanks Creek	-	-	None reported.
Marys River Basin Cr.	-	-	None reported.
T Creek	4	4	2
W.F. Marys River	-	-	None reported.
Wildcat Creek	1	1	1
Basin Creek	-	-	None reported.
GAWS Creek	-	-	None reported.
Short Creek	-	-	None reported.
Williams Basin Creek	-	-	None reported.
*Currant Creek	2	3	3

North Fork Humboldt River Subbasin

STREAM	ANGLERS	DAYS	YEARS REPORTED
N.F. Humboldt River	79	137	10
California Creek	-	-	None reported.
Foreman Creek	1	1	1
Gance Creek	21	52	7
Cole Canyon Creek	-	-	None reported.
Road Canyon Creek	-	-	None reported.
Warm Creek	-	-	None reported.
Mahala Creek	1	1	2
Pie Creek	1	2	1
Jim Creek	-	-	None reported.
Winters Creek	-	-	None reported.
Dorsey Creek	1	2	2
*Pratt Creek	7	37	2
*Beaver Creek	-	-	None reported.
*E.F. Beaver Creek	-	-	None reported.
*W.F. Beaver Creek	-	-	None reported.

* - Potential Sites

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Angler Questionnaire 1993-2002 Average

East Humboldt River Area

STREAM	ANGLERS	DAYS	YEARS REPORTED
Fourth Boulder Creek	-	-	None reported.
Second Boulder Cr.	2	22	4
E.F. Sherman Creek	-	-	None reported.
Sherman Creek	1	1	1
Conrad Creek	-	-	None reported.
N.F. Cold Creek	10	14	6-Report for all forks of "Cold Creek".
*John Day Creek	-	-	None reported.
*First Boulder Creek	1	1	1
*Third Boulder Creek	1	5	2
*Cold Creek	-	-	See report for N.F. Cold Creek
*M.F. Cold Creek	-	-	See report for N.F. Cold Creek
*N.F. Cold Creek	-	-	See report for N.F. Cold Creek
*Talbot Creek	3	33	1

South Fork Humboldt River Subbasin

STREAM	ANGLERS	DAYS	YEARS REPORTED
Dixie Creek	-	-	None reported.
Lee Creek	2	26	3
North Furlong Creek	1	1	1
Pearl Creek	25	86	6
Welch Creek	-	-	None reported.
Carville Creek	1	1	1
Gennette Creek	-	-	None reported.
Cottonwood Creek	-	-	None reported.
Mitchell Creek	-	-	None reported.
N.F. Mitchell Creek	-	-	None reported-Included in "Mitchell Creek".
Green Mtn. Creek	4	4	2
N.F. Green Mtn. Creek	-	-	None reported-Included in "Green Mtn. Creek".
Mahogany Creek	-	-	None reported.
Segunda Creek	-	-	None reported.
Long Canyon Creek	6	6	2
Rattlesnake Creek	5	11	3
McCutcheon Creek	-	-	None reported.
Smith Creek	4	10	5-Includes all forks of "Smith Creek".
M.F. Smith Creek	-	-	None reported-Included in "Smith Creek".
N.F. Smith Creek	-	-	None reported-Included in "Smith Creek".
*Brown Creek	1	1	1
*Box Canyon Creek	-	-	None reported.
*S.F. Smith Creek	-	-	None reported-Included in "Smith Creek".
*S.F. Green Mountain Creek	-	-	None reported-Included in "Green Mtn. Creek".
*Corral Creek	28	68	5
*Toyn Creek	6	14	4

* - Potential Sites

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Angler Questionnaire 1993-2002 Average

Maggie Creek Subbasin

STREAM	ANGLERS	DAYS	YEARS REPORTED
Maggie Creek	12	27	7
Beaver Creek	1	2	1
Coyote Creek	15	20	4
Little Jack Creek	-	-	None reported.
Toro Canyon Creek	-	-	None reported.
Williams Cnyn. Creek	-	-	None reported.
Little Beaver Creek	-	-	None reported.
Lone Mounain Creek	-	-	None reported.
*Indian Jack Creek	-	-	None reported.
*Susie Creek	-	-	None reported.
*Spring Creek	4	12	4

Rock Creek Subbasin

STREAM	ANGLERS	DAYS	YEARS REPORTED
Frazier Creek	1	1	1
Lewis Creek	-	-	None reported.
Nelson Creek	4	31	5
Upper Rock Creek	18	32	7
Toe Jam Creek	4	5	3
Upper Willow Creek	1	2	1
*Lower Willow Creek	-	-	None reported-Included in "Upper Willow Creek".
*Willow Cr. Reservoir	847	2,644	10
*Trout Creek	-	-	None reported.

Reese River Subbasin

STREAM	ANGLERS	DAYS	YEARS REPORTED
Marysville Creek	11	14	9
Tierney Creek	5	11	2
Washington Creek	61	160	10
Crane Canyon Creek	2	5	1
Stewart Creek	131	335	10-Includes all forks.
N.F. Stewart Creek	-	-	None reported-Included in "Stewart Creek".
M.F. Stewart Creek	-	-	None reported-Included in "Stewart Creek".
Cottonwood Creek	50	120	10
Mohawk Creek	2	3	2
*Illinois Creek	6	11	3
*Corral Creek	-	-	None reported.
*Big Sawmill Creek	2	3	5-Included in report for "Sawmill Creek".
*San Juan Creek	213	714	10

* - Potential Sites

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Angler Questionnaire 1993-2002 Average

South Fork Little Humboldt River Area

STREAM	ANGLERS	DAYS	YEARS REPORTED
S.F. Little Humboldt	1	1	1
Secret Creek	-	-	None reported.
Sheep Creek	-	-	None reported.
Pole Creek	-	-	None reported.
*Snowstorm Creek	-	-	None reported.
*Winters Creek	-	-	None reported.
*First Creek	-	-	None reported.
*Oregon Canyon Creek	-	-	None reported.

Pine Creek Subbasin

STREAM	ANGLERS	DAYS	YEARS REPORTED
Pete Hanson Creek	9	13	8
Birch Creek	-	-	None reported.
*Trout Creek	4	6	1
*Henderson Creek	-	-	None reported.
*Vinini Creek	-	-	None reported.

Interior Nevada Basins

STREAM	ANGLERS	DAYS	YEARS REPORTED
Mosquito Creek	92	223	10
Sante Fe Creek	-	-	None reported.
Shoshone Creek	-	-	None reported.
W.F. Deer Creek	-	-	None reported.
N.F. Pine Creek	268	603	10-Included in report for "Pine Creek".
S.F. Thompson Creek	1	1	1
Decker Creek	1	2	1
Moores Creek	-	-	None reported.

* - Potential Sites

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Upper Humboldt Basin Genetic Evaluations

Marys River Subbasin

STREAM NAME	COLLECTION YEAR	NUMBER COLLECTED	ANALYSIS TYPE	REPORT REFERENCED	RESULTS
Marys River	1979	10	Electro.	Gall 1981	Pure
T Creek	1979*	32	Electro.	Gall 1981	Pure
Currant Creek	1980	16	Electro.	Gall 1981	Hybrids
Currant Creek	1998	6	Nuclear DNA	Peacock 2003	**Hybrids
* - 1989 MtDNA analysis (Williams 1992).					
** - Sample contained hybrids and pure LCT.					

North Fork Humboldt River Subbasin

STREAM NAME	COLLECTION YEAR	NUMBER COLLECTED	ANALYSIS TYPE	REPORT REFERENCED	RESULTS
North Fork Humboldt River	1978*	43	Electro.	Gall 1981	Pure
California Creek	1978	12	Electro.	Gall 1981	Pure
Foreman Creek	1987	10	Electro.	Bartley 1989	Pure
Gance Creek	1978	40	Electro.	Gall 1981	Pure
Dorsey Creek	1987	5	Electro.	Bartley 1989	Pure
Dorsey Creek	1999	6	Nuclear DNA	Peacock 2003	**Hybrids
* - 1989 MtDNA analysis (Williams 1992).					
** - Sample contained hybrids and pure rainbow trout.					

East Humboldt River Area

STREAM NAME	COLLECTION YEAR	NUMBER COLLECTED	ANALYSIS TYPE	REPORT REFERENCED	RESULTS
Conrad Creek	1978	6	Electro.	Gall 1981	Pure
Fourth Boulder Creek	1985	-	Electro.	Bartley 1989	Pure

South Fork Humboldt River Subbasin

STREAM NAME	COLLECTION YEAR	NUMBER COLLECTED	ANALYSIS TYPE	REPORT REFERENCED	RESULTS
Dixie Creek	1986	15	Electro.	Bartley 1989	Pure
North Furlong Creek	1985*	10	Electro.	Bartley 1989	Pure
Pearl Creek	1984	21	Electro.	Bartley 1989	Pure
Carville Creek	1988	5	Electro.	Bartley 1989	Pure
Gennette Creek	1985	-	Electro.	Bartley 1989	Pure
Green Mountain Creek	1980	23	Electro.	Gall 1981	Pure
Segunda Creek	1986	14	Electro.	Bartley 1989	Hybrids
Segunda Creek	2000	13	Nuclear DNA	Peacock 2003	**Hybrids
Long Canyon Creek	1978	24	Electro.	Gall 1981	Pure
Long Canyon Creek	1979	18	Electro.	Gall 1981	Rainbow
Long Canyon Creek	2000	3	Nuclear DNA	Peacock 2003	***Hybrids
Smith Creek	1980	19	Electro.	Gall 1981	Pure
* - 1990 MtDNA analysis (Williams 1992).					
** - Sample contained hybrids and pure LCT.					
*** - Sample contained hybrids and pure rainbow trout.					

Maggie Creek Subbasin

STREAM NAME	COLLECTION YEAR	NUMBER COLLECTED	ANALYSIS TYPE	REPORT REFERENCED	RESULTS
Coyote Creek	1979*	37	Electro.	Gall 1981	Pure
Little Jack Creek	1997	27	MtDNA	Proebstel (AATA 1997)	Pure
* - 1989 MtDNA analysis (Williams 1992).					

Electro. - Protein Electrophoresis
MtDNA - Mitochondrial Deoxyribonucleic Acid

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Upper Humboldt Basin Genetic Evaluations

Rock Creek Subbasin

STREAM NAME	COLLECTION YEAR	NUMBER COLLECTED	ANALYSIS TYPE	REPORT REFERENCED	RESULTS
Frazier Creek	1979	14	Electro.	Gall 1981	Pure
Nelson Creek	1989	10	MtDNA	Williams 1992	Pure
Upper Rock Creek	1979	39	Electro.	Gall 1981	Pure
Toe Jam Creek	1989	7	MtDNA	Williams 1992	Pure

Reese River Subbasin

STREAM NAME	COLLECTION YEAR	NUMBER COLLECTED	ANALYSIS TYPE	REPORT REFERENCED	RESULTS
Marysville Creek	1979	12	Electro.	Gall 1981	Pure
Tierney Creek	1978	21	Electro.	Gall 1981	Pure
Washington Creek	1979	38	Electro.	Gall 1981	Pure
Crane Canyon Creek	1980	25	Electro.	Gall 1981	Pure
Stewart Creek	1988	4	Electro.	Bartley 1989	Pure
Cottonwood Creek	2000	32	Nuclear DNA	Peacock 2003	*Hybrids
* - Sample contained hybrids, pure rainbow trout, and pure LCT.					

South Fork Little Humboldt River Area

STREAM NAME	COLLECTION YEAR	NUMBER COLLECTED	ANALYSIS TYPE	REPORT REFERENCED	RESULTS
South Fork Little Humboldt River	1978	31	Electro.	Gall 1981	Pure
Secret Creek	1986	-	Electro.	Bartley 1989	Pure
Sheep Creek	1986	-	Electro.	Bartley 1989	Pure
Pole Creek	1986	-	Electro.	Bartley 1989	Pure

Pine Creek Subbasin

STREAM NAME	COLLECTION YEAR	NUMBER COLLECTED	ANALYSIS TYPE	REPORT REFERENCED	RESULTS
Birch Creek	1988	10	Electro.	Bartley 1989	Pure
Pete Hanson Creek	1998	22	Nuclear DNA	Peacock 2003	Pure
Trout Creek	1999	1	Nuclear DNA	Peacock 2003	Hybrid

Interior Nevada Basins

STREAM NAME	COLLECTION YEAR	NUMBER COLLECTED	ANALYSIS TYPE	REPORT REFERENCED	RESULTS
Shoshone Creek	1978	-	Electro.	Gall 1981	Pure

Electro. - Protein Electrophoresis
MtDNA - Mitochondrial Deoxyribonucleic Acid

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
LCT Recovery Streams and USFWS Recovery Objectives

Marys River Subbasin

Stream	Established 5 or More Years	3 or More Age Classes	Not Influenced by Non-Native Trout	Habitat Trend	Latest Habitat Survey Year
Marys River	X	X		Up	FS1987,BLM1997
Anderson Creek (Lower T Cr.)	X			Up	2002
Camp Draw Creek	X		X	Static/Up	1987
Chimney Creek	X	X	X	Up	1979
Conners Creek			X	Up	1997
Cutt Creek			X	Up	1997
Draw Creek	X		X	Up	2003
East Fork Marys River	X	X	X	Up	2003
Hanks Creek	X		X	Up	1997
Marys River Basin Creek	X	X	?	Up	1987
T Creek	X	X		Up	2003
West Fork Marys River	X	X	?	Up	2003
Wildcat Creek	X		X	Static	2001
Basin Creek	X	X	X	?	1979
GAWS Creek	X		X	?	1979
Short Creek			X	Up	-
Williams Basin Creek	X		X	?	1987
*Currant Creek				Up	1998

North Fork Humboldt River Subbasin

Stream	Established 5 or More Years	3 or More Age Classes	Not Influenced by Non-Native Trout	Habitat Trend	Latest Habitat Survey Year
North Fork Humboldt River	X	X		Up/Variable	FS1992,BLM1991
California Creek	X		X	Up	1996
Foreman Creek	X	X	X	Static/Up	2001/2002
Gance Creek	X	X	X	Up	FS1997
Cole Canyon Creek				Static	1997
Road Canyon Creek	X		X	Static	1997
Warm Creek			X	Up	1987
Mahala Creek			X	Up	2000
Pie Creek			X	Up/Variable	1985,1996, 2000
Jim Creek			X	Up	2002
Winters Creek			X	Static/Up	1997
Dorsey Creek				Up	1998
*Pratt Creek				Up	1999
*East Fork Beaver Creek			X	Static	1996
*West Fork Beaver Creek			X	Up	1995
*Beaver Creek			X	Static	1985

* - Potential Sites

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
LCT Recovery Streams and USFWS Recovery Objectives

East Humboldt River Area

Stream	Established 5 or More Years	3 or More Age Classes	Not Influenced by Non-Native Trout	Habitat Trend	Latest Habitat Survey Year
Fourth Boulder Creek	X	X		Up	2001
Second Boulder Creek	X	X		Static	2001
East Fork Sherman Creek			X	Down	1996
Sherman Creek	X		X	Static	1996
Conrad Creek				Static	1981
North Fork Cold Creek	X			?	1983
*John Day Creek			X	Up	1979
*First Boulder				Unknown	1984
*Third Boulder				Unknown	1984
*Cold Creek				Unknown	1983
*Middle Fork Cold Creek				Unknown	1983
*South Fork Cold Creek				Unknown	1981
*Talbot Creek				Unknown	1983

South Fork Humboldt River Subbasin

Stream	Established 5 or More Years	3 or More Age Classes	Not Influenced by Non-Native Trout	Habitat Trend	Latest Habitat Survey Year
Dixie Creek	X	X	X	Up	1997
Lee Creek	X	X	X	?	2001
North Furlong Creek	X	X		Static	2001
Pearl Creek	X	X		Variable	FS2003,BLM1994
Welch Creek	X		X	Static	1999
Carville Creek	X	X	X	Static	2000
Gennette Creek	X			Up	1999
Cottonwood Creek			X	Static	2000
Mitchell Creek			X	BLM-Up,FS-Down	FS2001,BLM2002
North Fork Mitchell Creek			X	?	1980
Green Mountain Creek				Static	2001
N. F. Green Mountain Creek	X			Up	2001
Mahogany Creek	X	X		Static/Up	2000
Segunda Creek	X	X		Static	2001
Long Canyon Creek	X	X		Up	2001
Rattlesnake Creek				Static	2000
McCutcheon Creek	X			Static	1999
Smith Creek	X	X		Up	1999
Middle Fork Smith Creek	X	X		Static	1999
North Fork Smith Creek	X			Down	1999
*Brown Creek				Static	2003
*Box Canyon Creek				Static	1985
*S.F. Smith Creek				Unknown	1979
*S.F. Green Mountain Creek				Up	2001
*Toyn Creek				Unknown	2003
*Corral Creek				Unknown	2003

* - Potential Sites

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
LCT Recovery Streams and USFWS Recovery Objectives

Maggie Creek Subbasin

Stream	Established 5 or More Years	3 or More Age Classes	Not Influenced by Non-Native Trout	Habitat Trend	Latest Habitat Survey Year
Maggie Creek	X		X	Up	1996/1998
Beaver Creek	X	X	X	Up	2000
Coyote Creek	X	X	X	Static-Up	2001
Little Jack Creek	X	X	X	Static-Up	2001
Toro Canyon Creek	X	X	X	Up	2000
Williams Canyon Creek			X	Down	2000
Little Beaver Creek	X	X	X	Up	2000
Lone Mountain Creek		X	X	**FAR-Up	2001
*Indian Jack Creek			X	Up	1998
*Susie Creek			X	UpBLM/DownPri.	1996, 2003
*Spring Creek			X	Unknown	-

Rock Creek Subbasin

Stream	Established 5 or More Years	3 or More Age Classes	Not Influenced by Non-Native Trout	Habitat Trend	Latest Habitat Survey Year
Frazier Creek	X	X	X	Up	2003
Lewis Creek	X		X	Static	2002
Nelson Creek	X	X	X	Up	2002
Upper Rock Creek	X		X	Static	2003
Toe Jam Creek	X	X	X	Static	2003
Upper Willow Creek			X	Down	2003
*Willow Creek Reservoir	X			-	-
*Lower Willow Creek			X	Unknown	1988
*Trout Creek			X	Static/Down	1993

Reese River Subbasin

Stream	Established 5 or More Years	3 or More Age Classes	Not Influenced by Non-Native Trout	Habitat Trend	Latest Habitat Survey Year
Marysville Creek	X	X		Static/Up	1999
Tierney Creek	X			?	1991
Washington Creek	X	X	X	?	1980
Crane Canyon Creek	X	X	X	Static	2001
Stewart Creek				Static	1999
North Fork Stewart Creek	X			Static	1999
Middle Fork Stewart Creek	X			Static	1999
Cottonwood Creek	X			Static/Up	2001
Mohawk Creek	X		X	Down	1990
*Illinois Creek				Down	1999
*Big Sawmill Creek				Static/Up	2000
*San Juan Creek				Static/Up	2001
*Corral Creek			X	Up	1998

* - Potential Sites
**FAR - Functional at Risk

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
LCT Recovery Streams and USFWS Recovery Objectives

South Fork Little Humboldt River Area

Stream	Established 5 or More Years	3 or More Age Classes	Not Influenced by Non-Native Trout	Habitat Trend	Latest Habitat Survey Year
S.F. Little Humboldt River	X	X	X	Static/Up	2003
Secret Creek	X		X	Static/Up	2003
Sheep Creek	X	X	X	Up	2003
Pole Creek	X	X	X	Static	2003
*First Creek			X	Static	1997
*Snowstorm Creek		X	X	Static	1997
*Winters Creek		X	X	Static	1997
*Oregon Canyon Creek			X	Down	2003

Pine Creek Subbasin

Stream	Established 5 or More Years	3 or More Age Classes	Not Influenced by Non-Native Trout	Habitat Trend	Latest Habitat Survey Year
Pete Hanson Creek	X	X	X	Unknown	1984
Birch Creek	X	X	X	Unknown	1984
*Trout Creek				Up (Enclosures)	2000
*Henderson Creek				Unknown	1984
*Vinini Creek				Unknown	1984

Interior Nevada Basins

Stream	Established 5 or More Years	3 or More Age Classes	Not Influenced by Non-Native Trout	Habitat Trend	Latest Habitat Survey Year
Mosquito Creek	X	X		No Data	?
Sante Fe Creek	X	X	X	?	1980
Shoshone Creek	X	X	X	?	1984
West Fork Deer Creek				Up	1997
North Fork Pine Creek	X			?	1991
South Fork Thompson Creek	X	X		Unknown	1982
Decker Creek	X	X	X	Up	1993
Moores Creek				No Data	?

* - Potential Sites

APPENDIX E

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN

Upper Humboldt Basin Streams Lacking Genetic Evaluations

STREAM NAME	DRAINAGE BASIN
Camp Draw Creek	Marys River Subbasin
Chimney Creek	"
Conners Creek	"
Cutt Creek	"
Draw Creek	"
East Fork Marys River	"
Hanks Creek	"
Marys River Basin Creek	"
West Fork Marys River	"
Wildcat Creek	"
Basin Creek	"
GAWS Creek	"
Short Creek	"
Williams Basin Creek	"
Cole Canyon Creek	N.F. Humboldt River Subbasin
Road Canyon Creek	"
Warm Creek	"
Mahala Creek	"
Pie Creek	"
Jim Creek	"
Winters Creek	"
Second Boulder Creek	East Humboldt River Area
East Fork Sherman Creek	"
Sherman Creek	"
North Fork Cold Creek	"
Lee Creek	S.F. Humboldt River Subbasin
Mahogany Creek	"
Welch Creek	"

STREAM NAME	DRAINAGE BASIN
Cottonwood Creek	S.F. Humboldt River Subbasin
Mitchell Creek	"
North Fork Mitchell Creek	"
Rattlesnake Creek	"
McCutcheon Creek	"
Maggie Creek	Maggie Creek Subbasin
Beaver Creek	"
Toro Canyon Creek	"
Indian Jack Creek	"
Williams Canyon Creek	"
Little Beaver Creek	"
Lewis Creek	Rock Creek Subbasin
Upper Willow Creek	"
Mohawk Creek?	Reese River Subbasin
Snowstorm Creek	S.F. Little Humboldt River Area
First Creek	"
Winters Creek	"
Oregon Canyon Creek	"
Mosquito Creek	Interior Nevada Basins
Sante Fe Creek	"
W.F. Deer Creek	"
N.F. Pine Creek	"
S.F. Thompson Creek	"
Decker Creek	"
Moores Creek	"

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Nevada Department of Wildlife Implementation Schedule

RECOVERY ACTION	YEAR-2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Population Monitoring- Number of Streams by Subbasin. **(Streams from each list will be prioritized based on need**.)	SFHRS-11 RRS-7 NFHRS-2 RCS-1 EHRA-1 MCS-1 PCS-2	MRS-7 MCS-4 INB-3 SFHRS-2 EHRA-2 RRS-1 SFLHRA-1 RCS-1 NFHRS-1	RCS-6 SFLHRA-3 MCS-2 INB-2 SFHRS-1 NFHRS-1	NFHRS-8 MRS-5 SFLHS-3 INB-2 MCS-1 SFHRS-1 RRS-1	MRS-9 SFHRS-6 EHRA-5 NFHRS-3 PCS-2	SFHRS-11 RRS-7 NFHRS-2 RCS-1 EHRA-1 MCS-1	MRS-7 MCS-4 INB-3 SFHRS-2 EHRA-2 RRS-1 SFLHRA-1 RCS-1 NFHRS-1	RCS-6 SFLHRA-3 MCS-2 INB-2 SFHRS-1 NFHRS-1	NFHRS-8 MRS-5 SFLHS-3 INB-2 MCS-1 SFHRS-1 RRS-1	MRS-9 SFHRS-6 EHRA-5 NFHRS-3 INB-2
Treatment/ Barrier Evaluation - Number of Streams by Subbasin	RRS-1 SFHRS-1	RRS-1 SFHRS-1	RRS-1 SFHRS-2	SFHRS-2 MRS-1	SFHRS-2 MRS-1	MCS-1 NFHRS-2	MCS-1 EHRA-1	EHRA-2 PCS-1	EHRA-1 PCS-2	INBS-3 As Needed
Treatment/ Barrier Projects	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams
Habitat Evaluation of Streams Lacking LCT Populations	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams
Reintroduction/ Augmentation	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams	1-2 Streams
Genetic Evaluations	8 Streams	As Needed	As Needed	As Needed	As Needed	As Needed	As Needed	As Needed	As Needed	As Needed
Disease Evaluations		5 Streams	As Needed	As Needed	As Needed	As Needed	As Needed	As Needed	As Needed	As Needed

MRS-Marys River Subbasin, NFHRS-North Fork Humboldt River Subbasin, EHRA-East Humboldt River Area.
SFHRS-South Fork Humboldt River Subbasin, MCS-Maggie Creek Subbasin, RCS-Rock Creek Subbasin.
RRS-Reese River Subbasin, SFLHRA-South Fork Little Humboldt River Area, PCS-Pine Creek Subbasin, INB-Interior Nevada Basins.

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Lahontan Cutthroat Trout Habitat Status
Marys River Subbasin-BLM Administered Lands

Stream	Most Recent Survey	Riparian Condition Class (% Optimum)	Habitat Condition Class (% Optimum)	Trend (in comparison to baseline surveys)	Comments
Upper Marys River	1997	62	64	Up	No Grazing 18 Survey Stations
Lower Marys River	1997	52	29	Up	No Grazing 21 Survey Stations
Conners Creek	1997	69	55	Up	Rotational Grazing 9 Survey Stations
Cutt Creek	1997	66	61.5	Up	No Grazing 8 Survey Stations
Hanks Creek	1997	69	63	Up	Rotational Grazing 19 Survey Stations
Currant Creek	1999	61	43	Up	No Grazing (BLM) Stations 4, 5, and 6
T Creek	1999	64	47	Up	Exclosures Stations 1, 2, 7-17
Draw Creek	1999	62	40	Up	Grazing System
Wildcat Creek (S-4 only)	1997	66	48	Up	Riparian Fencing
Wildcat Creek (S-1 only)	1999	51	24	Up	Grazing System Implemented
Wildcat Creek (S-6 only)	2000	55	38		

Marys River Subbasin-USFS Administered Lands

Stream	Condition*	Trend**
Basin Creek	Unsatisfactory	?
Camp Draw Creek	Satisfactory	Static/Up
Chimney Creek	Unknown	?
Draw Creek	Satisfactory	Up
GAWS Creek	Satisfactory	?
Marys River	Satisfactory	Up
East Fork Marys River	Satisfactory	Up
West Fork Marys River	Satisfactory	Up
Marys River Basin Creek	Unsatisfactory	Up
Short Creek	Unknown	?
T Creek	Satisfactory	Up
Wildcat Creek	Unknown	Static
Williams Basin Creek	Satisfactory	?

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** - Based on professional judgement, photo records, GAWS survey, ecology plots, greenline surveys, or reverine/riparian assessment.

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Lahontan Cutthroat Trout Habitat Status
North Fork Humboldt River Subbasin-BLM Administered Lands

Stream	Most Recent Survey	Riparian Condition Class (% Optimum)	Habitat Condition Class (% Optimum)	Trend (in comparison to baseline surveys)	Comments
Dorsey Creek	1998	63	37	Up	Better grazing practices in some areas.
W.F. Beaver Creek	2000	58	47	Up from baseline Down in recent years	Grazing System Implemented
E.F. Beaver Creek	1996	58	39	Static	Mostly hot season use with limited fencing.
North Fork Humboldt River	1991	52	32	Variable-up in N.F. Group Allot.; static in Devils Gate Allot.	Riparian Fencing-N.F. Group Allotment; hot season use in Devils Gate.
Lower Pie Creek (below SR225)	1996 (S-1) only)-rest 1985	58 (S-1)	50 (S-1)	Up (overall)	Riparian Fencing
Upper Pie Creek (above SR225)	2000	54	48	Variable-up in lower reaches down in upper reaches.	Early grazing lower reaches; season-long upper reaches.
Jim Creek	2002 (NDOW)	61	57	Unknown	Riparian habitat rated in fair condition

North Fork Humboldt River Subbasin-USFS Administered Lands

Stream	Condition*	Trend**
California Creek	Satisfactory	Up
Cole Canyon Creek	Unsatisfactory	Static
Foreman Creek	Satisfactory	Static/Up
Gance Creek	Satisfactory	Up
Jim Creek	Unsatisfactory	Up
Mahala Creek	Unsatisfactory	Up
North Fork Humboldt River	Unsatisfactory	Up
Road Canyon Creek	Unsatisfactory	Static
Warm Creek	Unsatisfactory	Up
Winters Creek	Satisfactory	Static/Up

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LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Lahontan Cutthroat Trout Habitat Status
East Humboldt River Area-BLM Administered Lands

Stream	Most Recent Survey	Riparian Condition Class (% Optimum)	Habitat Condition Class (% Optimum)	Trend (in comparison to baseline surveys)	Comments
W.B. Sherman Creek	1996	41	40	Static	Continued unauthorized use
E.B. Sherman Creek	1996	36	33	Down	Continued unauthorized use

East Humboldt River Area-USFS Administered Lands

Stream	Condition*	Trend**
Conrad Creek	Satisfactory	Static
Fourth Boulder Creek	Satisfactory	Up
Second Boulder Creek	Satisfactory	Static
John Day Creek	Satisfactory	?
North Fork Cold Creek	Unsatisfactory	?

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LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Lahontan Cutthroat Trout Habitat Status
South Fork Humboldt River Subbasin-BLM Administered Lands

Stream	Most Recent Survey	Riparian Condition Class (% Optimum)	Habitat Condition Class (% Optimum)	Trend (in comparison to baseline surveys)	Comments
Pearl Creek-Exclosures	1994 PFC in 2002	48	55	Up	Trend up in exclosures. Trend down outside of exclosures (hot season use)
Mitchell Creek	2002	44	38	Up (stations containing water)	Flow diversions, wildfire impacts in 1999, early grazing system to be implemented in 2002
Dixie Creek	1997	60	60	Up (set back by fire)	implemented-wildfire impacts in 1999, recent unauthorized grazing

South Fork Humboldt River Subbasin-USFS Administered Lands

Stream	Condition*	Trend**
Box Canyon Creek	Satisfactory	Static
Brown Creek	Satisfactory	Static
Carville Creek	Satisfactory	Static
Cottonwood Creek	Satisfactory	Static
Green Mountain Creek	Satisfactory	Static
N.F. Green Mountain Creek	Satisfactory	Up
S.F. Green Mountain Creek	Satisfactory	Up
Gennette Creek	Satisfactory	Up
Lee Creek	Satisfactory	?
Long Canyon Creek	Satisfactory	Up
Mahogany Creek	Satisfactory	Static/Up
McCutcheon Creek	Satisfactory	Static
Mitchell Creek	Unsatisfactory	Down
N.F. Mitchell Creek	Unsatisfactory	?
North Furlong Creek	Satisfactory	Static
Pearl Creek	Unsatisfactory	Variable
Rattlesnake Creek	Satisfactory	Static
Segunda Creek	Satisfactory	Static
Smith Creek	Satisfactory	Up
North Fork Smith Creek	Satisfactory	Down
Middle Fork Smith Creek	Satisfactory	Static
Toyn Creek	Unsatisfactory	?
Corral Creek	Unknown	?
Welch Creek	Satisfactory	Static

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LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Lahontan Cutthroat Trout Habitat Status
Maggie Creek Subbasin-BLM Administered Lands

Stream	Most Recent Survey	Riparian Condition Class (% Optimum)	Habitat Condition Class (% Optimum)	Trend (in comparison to baseline surveys)	Comments
Maggie Creek (Entire)	1996/98	58-79	NA	Up	Implementation of Maggie Creek Watershed Restoration Project (MCWRP)
Maggie Creek (MCWRP Area)	2001	68	NA	Up	
Coyote Creek	2001 (upper)	83	NA	Static-Up	See above.
Little Jack Creek	2001 (upper)	56	NA	Static-Up	See above.
Indian Jack Creek	1998	48	35	Up	See above.
Beaver Creek	2000	77	50	Up	Riparian Pasture Severe wildfire-2001
Toro Canyon	2000	79	Dry-no data	Up	Riparian Pasture-Fire Closure
Williams Canyon	2000	39	37	Down	Hot season grazing
Little Beaver Creek	2000	72	44	Up	Riparian Pasture Severe wildfire-2001
Lone Mountain Creek	2000*	No data	No data	Est. Down	Newly discovered LCT population
Lower Susie Creek (S1-S7)	2003	63	33	Static	Riparian Pasture
Upper Susie Creek (S8-S9)	1996	44	26	Static-Down	Unauthorized grazing in

* - Valdez, R. and M. Trammel. 2000. Stream Surveys of the Maggie Creek Subbasin, Nevada. Report prepared for Newmont Mining Corporation. Elko, Nevada.

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Lahontan Cutthroat Trout Habitat Status
Rock Creek Subbasin-BLM Administered Lands

Stream	Most Recent Survey	Riparian Condition Class (% Optimum)	Habitat Condition Class (% Optimum)	Trend (in comparison to baseline surveys)	Comments
Upper Rock Creek	2003	57	57	Static	Grazing system to be implemented in 2004
Upper Willow Creek	2003	46	49	Down	Will be grazed under the provisions of the Upper Willow Creek Habitat Enhancement Plan-2004
Lewis Creek	2002	41	63	Static	See Upper Willow Creek
Nelson Creek	2002	73	63	Up	See Upper Willow Creek
Toe Jam Creek	2003	58	55	Static	See Upper Rock Creek
Frazier Creek	2003	73	62	Up	Fire Closure-recovering from 2001 wildfire
Trout Creek	1993 (NDOW-GAWS)	56	57	Static-Down	See Upper Rock Creek

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Lahontan Cutthroat Trout Habitat Status
Reese River Subbasin-USFS Administered Lands

Stream	Condition*	Trend**
Marysville Creek	Satisfactory	Static/Up
Tierney Creek	Unsatisfactory	?
Washington Creek	Unsatisfactory	?
Crane Creek	Satisfactory	Static
Stewart Creek	Satisfactory	Static
North Fork Stewart Creek	Satisfactory	Static
Middle Fork Stewart Creek	Satisfactory	Static
Cottonwood Creek	Satisfactory	Static/Up
Mohawk Creek	Unsatisfactory	Down
Illinois Creek	Unsatisfactory	Down
Big Sawmill Creek	Satisfactory	Static/Up
San Juan Creek	Satisfactory	Static/Up
Corral Creek	Satisfactory	Up

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LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Lahontan Cutthroat Trout Habitat Status
South Fork Little Humboldt River Subbasin-BLM Administered Lands

Stream	Most Recent Survey	Riparian Condition Class (% Optimum)	Habitat Condition Class (% Optimum)	Trend (in comparison to baseline surveys)	Comments
South Fork Little Humboldt River (Elko)	2003 Survey stations S-5, S5A, S6	44	53	Static/Up	Temporarily closed until criteria met under provisions of 2002 settlement agreement for SFLHR Basin
South Fork Little Humboldt River below Pole Creek	1998 (NDOW-GAWS)	78(bank cover) 84(bank stability)	75.5	Up	Exclosure-Wilderness Study Area
Sheep Creek	2003 Survey stations SA1A,SA2A,S3	80	56	Up	See SFLHR (Elko)
Secret Creek	2003 Survey stations S1, S2	60	47	Static/Up	See SFLHR (Elko)
Pole Creek-Upper	2003	58	56	Static	See SFLHR (Elko)
First Creek	1997 (NDOW-GAWS)	72(bank cover) 75(bank stability)	68	Static	Impacted by fire in 1996.
Snowstorm Creek	1997 (NDOW-GAWS)	73(bank cover) 69(bank stability)	59	Static	
Winters Creek	1997 (NDOW-GAWS)	66(bank cover) 56(bank stability)	62	Static	
Oregon Canyon Creek	2003 Survey station S1	38	28	Down	Heavily grazed in 2003

LAHONTAN CUTTHROAT TROUT SPECIES MANAGEMENT PLAN
Lahontan Cutthroat Trout Habitat Status
Pine Creek Subbasin and Interior Nevada Basins-BLM Administered Lands

Stream	Most Recent Survey	Riparian Condition Class (% Optimum)	Habitat Condition Class (% Optimum)	Trend (in comparison to baseline surveys)	Comments
Trout Creek	2000	62	52	Up due to exclosures.	Severe wildfire impacts. Mostly rested 2000-2001
Henderson Creek	1984	Unknown	*Fair	Unknown	
Vinini Creek	1984	Unknown	*Fair	Unknown	
Birch Creek	1984	Unknown	*Fair	Unknown	
Pete Hanson Creek	1984	Uninown	*Fair		
West Fork Deer Creek-BLM administered land only.	1997	85	73	Up	Exclosure Fencing

*-Stream Channel Stability Rating

Interior Nevada Basins-USFS Administered Lands

Stream	Condition*	Trend**
Mosquito Creek	Satisfactory	?
Sante Fe Creek	Satisfactory	?
Shoshone Creek	Satisfactory	?
North Fork Pine Creek	Unsatisfactory	?
Decker Creek	Satisfactory	?
Moores Creek	Unsatisfactory	?

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