

# **SUMMIT LAKE PAIUTE TRIBE**

## **NONPOINT SOURCE MANAGEMENT PLAN**

UNDER THE AUTHORITY OF SECTION 319 OF THE CLEAN WATER ACT



**SUMMIT LAKE PAIUTE TRIBE NATURAL RESOURCES DEPARTMENT**  
Prepared by Rachael Youmans, Fish and Wildlife Biologist

**OCTOBER 2015**

## Table of Contents

TABLE OF CONTENTS .....	2
LIST OF APPENDICES .....	3
ACRONYMS AND ABBREVIATIONS.....	4
<b><u>CHAPTER I: INTRODUCTION .....</u></b>	<b><u>5</u></b>
MISSION AND PURPOSE.....	5
PLAN DEVELOPMENT .....	5
CONCLUSIONS .....	6
EXISTING AUTHORITIES AND PROGRAMS.....	6
GOALS AND OBJECTIVES OF NPS PROGRAM .....	7
<b><u>CHAPTER II: BACKGROUND .....</u></b>	<b><u>8</u></b>
BACKGROUND OF SUMMIT LAKE PAIUTE TRIBE AND RESERVATION.....	8
HISTORY.....	8
SOCIOECONOMIC DESCRIPTION.....	8
TERRAIN AND HISTORIC LAND USE.....	9
CURRENT LAND OWNERSHIP DESCRIPTIONS .....	9
<b>CURRENT LAND USES .....</b>	<b>10</b>
LCT FISHERY .....	10
TRADITIONAL AND CULTURAL PURPOSES.....	10
RECREATION .....	11
GRAZING .....	11
RESIDENTIAL TRIBAL MEMBERS.....	11
FACILITIES.....	11
<b>WATER RESOURCE DESCRIPTIONS .....</b>	<b>12</b>
SURFACE WATER .....	12
GROUND WATER.....	17
<b><u>CHAPTER III: NONPOINT SOURCE MANAGEMENT CONCERNS .....</u></b>	<b><u>20</u></b>
<b>NPS SOURCES AND CONTRIBUTORS.....</b>	<b>20</b>
A. ON-RESERVATION SOURCES AND CONCERNS .....	20
B. OFF-RESERVATION SOURCES AND CONCERNS.....	25
C. FUTURE NPS CONCERNS .....	28
<b><u>CHAPTER IV: BEST MANAGEMENT PRACTICE RECOMMENDATIONS .....</u></b>	<b><u>29</u></b>
ON-RESERVATION SOURCES AND CONCERNS.....	29
OFF-RESERVATION SOURCES AND CONCERNS.....	31
FUTURE NPS CONCERNS.....	32
<b><u>CHAPTER V: CONCLUSIONS AND FUTURE ACTIVITIES.....</u></b>	<b><u>33</u></b>
CONCLUSIONS .....	33
MULTI PHASED APPROACH.....	33

**FUTURE NONPOINT SOURCE POLLUTION PROJECT POSSIBILITIES.....34**

**CHAPTER VI: REFERENCES ..... 37**

**CHAPTER VII: APPENDICES ..... 38**

**List of Appendices**

- APPENDIX A: WATER QUALITY DATA**
- APPENDIX B: RANGE UNIT MAP**
- APPENDIX C: LAND USE MAP**
- APPENDIX D: LAND OWNERSHIP MAP**
- APPENDIX E: WASTE DISPOSAL ON MAHOGANY CREEK**
- APPENDIX F: TABLE TO CONNECT NPS SOURCES TO BMPs**
- APPENDIX G: TIMELINE FOR COOPERATION WITH BLM REGARDING WILD/FERAL HORSE MANAGEMENT**

DRAFT

## Acronyms and Abbreviations

<b>Acronym or Abbreviation</b>	<b>Stands for</b>
2001 Report and Management Plan	2001 Final Nonpoint Source Assessment Report and Management Plan
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practice
BOR	Bureau of Reclamation
CWA	Clean Water Act
EPA	Environmental Protection Agency
LCT	Lahontan Cutthroat Trout
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
NRD	Natural Resources Department
Reservation	Summit Lake Paiute Reservation
Tribe	Summit Lake Paiute Tribe
Tribal Member	Summit Lake Paiute Tribal Member
USFWS	U.S. Fish and Wildlife Service

## **CHAPTER I: INTRODUCTION**

### **Mission and Purpose**

*Mission:* To promote healthy ecosystems and maintain good to excellent water quality in water bodies on the Summit Lake Paiute Reservation (Reservation) for the benefit of Summit Lake Paiute Tribal members (Tribal members) and the protection of Lahontan cutthroat trout (LCT) and other priority wildlife species.

*Purpose Statement:* The purpose of this Nonpoint Source Pollution Assessment and Management Plan is to identify sources both on and off the Reservation that are contributing nonpoint source (NPS) pollution to the ground and surface waters on the Reservation, assess the effectiveness of Best Management Practices (BMPs) that have been implemented to address these sources, and describe new BMPs necessary to continue protecting the Reservation's water sources.

### **Plan Development**

In January 2001, the Summit Lake Paiute Tribe (Tribe) received approval of a Final Nonpoint Source Assessment Report and Management Plan (2001 Report and Management Plan) that had been submitted to the Environmental Protection Agency (EPA). This 2001 Report and Management Plan analyzed NPS pollution sources on and off the Reservation and suggested BMPs to improve water quality on the Reservation. The NPS categories found to be most negatively impacting Reservation water quality at that time were agriculture and grazing related sources, habitat modification through removal of riparian vegetation and bank destabilization, land disposal defined by inappropriate waste disposal and privy use, hydromodification through unregulated stream crossings, and road inundation during high stands of the lake. This report listed some BMPs already in use by the Tribe, such as stream protection and stabilization to help with habitat modification, watering development, salt placement, development of a range management plan, fencing to help manage NPS pollution contributions from agriculture and grazing sources, and Tribal water ordinance No. VIII, which addressed inappropriate waste disposal and privies.

In 2010, staff in the Tribe's Natural Resources Department (NRD) recognized that the 2001 Report and Management Plan needed to be updated with current NPS concerns so that management strategies could be modified to better fit existing needs for NPS control on the Reservation. This prompted a major revision of the plan. The NRD compared NPS sources and concerns listed in the 2001 plan to current NPS sources and concerns noted by NRD staff throughout the previous year, and identified additional NPS sources that had become concerns since the 2001 plan was written. Through an EPA Clean Water Act (CWA) Section 106 grant the Tribe had also begun to maintain a water quality monitoring program in the interim, conducting annual fall and spring sampling events. Results from these events were also considered in the 2010 update, as they assisted with prioritizing and updating water quality and NPS source concerns. (See Appendix A for relevant water quality data).

The NRD found that many of the issues presented in the 2001 Report and Management Plan were still prevalent; however, some of the issues had become elevated, and some of the sources

were more severe contributors than when the previous plan was written. For example, grazing-related issues both on and off the Reservation had become more intense due to greater concentrations of feral and wild horses within and outside of the Reservation boundary competing for food and water, and invasive plant and aquatic species had become more widespread and were a major NPS concern on the Reservation.

Tribal members and partnering agency personnel were given the chance to comment on the document, and appropriate edits were incorporated before the Council adopted the revised plan by Resolution in October 2010.

Additional revisions to this plan to update descriptions of resources and infrastructure, address inconsistencies, describe implementation activities, and add to lists of NPS concerns and projects took place in 2013 and 2015. Both revisions were approved and adopted by the Council by Resolution.

### **Conclusions**

NPS sources and contributors generally stayed the same between the 2001 and 2010 NPS assessments. One exception was the subcategory of “Inappropriate Waste Disposal” mentioned in the 2001 assessment; this was no longer seen as an NPS concern and is not mentioned in the 2010 assessment. Conversely, invasive species were not mentioned as an NPS concern in the 2001 assessment, but have become a major concern in the 2010 assessment. In the 2015 revision, rodents were added as a sub-category of the Infrastructure NPS concern category. This had not been included in any previous assessment.

Based on the assessment of NPS pollution sources and contributors presented in this document, the need to annually maintain fences, reroute and/or redesign transportation corridors, improve waste management, and develop a watershed-based plan is evident. These recommended BMPs will guide management of NPS pollution for the Tribe into the future.

### **Existing Authorities and Programs**

The Tribe has the authority to administer this assessment and develop the following management plan according to Treatment as a State status received from the EPA for CWA Section 319 funding on January 26, 2001. Since then, the Tribe has administered a NPS pollution program funded by Section 319 of the CWA.

Other than EPA CWA Section 319 funding, little additional funding is available for the Tribe to implement the management actions in this plan. However, the Bureau of Reclamation (BOR) provided financial assistance to the Tribe that supported efforts to complete a task for the Tribe’s CWA Section 319 grant to install a watering facility for livestock and wildlife, and both the Bureau of Indian Affairs (BIA) and U.S. Fish and Wildlife Service (USFWS) have provided assistance to implement a noxious weed management program.

Since 2001, partnerships have been formed with and technical support obtained from USFWS, Bureau of Land Management (BLM), BIA, BOR, and the Natural Resources Conservation Service (NRCS).

## **Goals and Objectives of NPS Program**

### **Goal 1: Maintain compliance with the Clean Water Act, Safe Drinking Water Act, and future Tribal water quality regulations**

*Objective A:* Achieve and maintain good to excellent quality in water bodies for the benefit of Tribal members

*Objective B:* Decrease the potential for dust deposition in waterways

*Objective C:* Improve facilities at the Tribal Compound and other locations used by Tribal members and employees to mitigate potential hazardous contaminants or NPS contributors

*Objective D:* Improve community and Tribal member awareness of NPS issues and contributors

### **Goal 2: Protection of healthy ecosystems**

*Objective A:* Minimize destructive activities that increase erosion and introduce nonpoint source pollution into waterways

*Objective B:* Increase monitoring of riparian and aquatic ecosystems, stream morphology, and activities that can negatively impact water and plant resources

### **Goal 3: Protection of the Lahontan cutthroat trout population and other priority wildlife species**

*Objective A:* Prevent introduction of bacteria, viruses, and other harmful vectors or excess sediment, nutrients, or other substances that jeopardize the existence of LCT or any wildlife species.

*Objective B:* Monitor climate change effects in the northern Great Basin Desert ecosystem to determine potential impacts to the priority wildlife species and sensitive habitats on the Reservation

### **Goal 3:**

## **CHAPTER II: BACKGROUND**

### **Background of Summit Lake Paiute Tribe and Reservation**

#### **History**

Tribal culture is inherently tied to the wildlife and natural resources surrounding Summit Lake. Traditionally, members of the Summit Lake Paiute Tribe are known as Agai Panina Ticutta, “lake trout eaters,” and they moved throughout a 2,800 square mile area during the year following food supplies. Summit Lake was the focal point of occupation.

In November 1865, a military post was established at a place known as Summit Springs in northwestern Nevada. The purpose of the post, named Fort McGarry, was to protect the pony express route on the Idaho mail road and the mail carriers and settlers who used it to reach the Northwest Territory. Two years later, 75 square miles around Fort McGarry were declared to be a military reservation, the largest in Nevada. The Army used Fort McGarry for only four years before leaving and turning it over to the Department of the Interior in 1871 for use as “an Indian Reservation for Paiute and Shoshone Indians.” Portions of structures from Fort McGarry can still be seen on the Reservation.

Although the land was reserved for both Paiutes and Shoshones, the people that resided at and near Summit Lake were mostly affiliated with Northern Paiutes. In 1891 and 1892, several residents of Summit Lake applied to the government to ask that the land they resided on be allotted to them permanently under provisions of the Allotment Act of 1887. Today nine Indian allotments exist, with six allotments located within the Reservation and three allotments located outside and west of the Reservation. By Presidential Executive Order, about 5,000 acres were set aside as a reservation for Northern Paiutes at Summit Lake on January 14, 1913. Subsequent actions have added additional acreage to the total Reservation size. Today the Summit Lake Indian Reservation encompasses 10,863 acres in northwestern Nevada and includes Summit Lake within its boundary.

By election on October 24, 1964, the members of Agai Panina Ticutta chose to give up their traditional form of government to become an American Indian Tribe recognized by the federal government and changed their name to the Summit Lake Paiute Tribe of Nevada. The Tribe was officially recognized and its Articles of Association approved by John A. Carver Jr., Acting Secretary of the U.S. Department of the Interior on January 8, 1965.

#### **Socioeconomic Description**

The Reservation is remotely located, and its distance from nearby population centers provides little to no economic opportunity for residents. Existing possible economic activities are the permitting of lands for grazing or work connected to LCT (*Oncorhynchus clarki henshawii*) fishery. Living conditions on the Reservation are primitive, and survival is especially harsh during periods when snowfall or other inclement weather events limit access on unimproved dirt roads on and leading to the Reservation. There is little existing infrastructure, although electricity was installed on the Reservation in 1991. For these reasons, the Reservation is currently occupied only seasonally and when weather and road conditions permit.

## **Terrain and Historic Land Use**

The terrain on and around the Reservation is varied and ranges from broad, flat valleys to rolling hills to vertical cliffs. Volcanic and prehistoric rock features formed by ancient lakes are scattered throughout the landscape. Ecologically, the area is characterized by semi-arid high desert and sagebrush steppe, which support vegetation that can survive in the rocky, alkaline soil. In 2006, BIA officials conducted a vegetation survey of the Reservation. It revealed four primary ecological sites, three of which were dominated by a big sagebrush/bluebunch wheatgrass vegetative community and one by a Nevada bluegrass vegetative community (USDOI 2006).

Reservation lands have been utilized for a variety of operations through time, including subsistence farming, forage crops, agriculture, and grazing.

Incidental, permitted, and trespass grazing on the Reservation has taken place for centuries. Stray horses from the Army's occupation of Fort McGarry and surrounding lands and escaped ranch horses likely formed the herd of wild horses that has grazed the range both on and around the Reservation since the mid 1800's (SLPT 2010). Organized grazing probably began on the Reservation in the 1930's in conjunction with the Taylor Grazing Act and BIA directives. When more Tribal members began settling on the Reservation in the 1960's, many families had their own herds of cattle and horses, which continued until recent times.

The first management plan to regulate grazing on the Reservation was the 1986 Range Management Plan, which identified six range units and recommended a May 1 through November 1 season of use for approximately 200 head of livestock (Vaile 1986). Over the past 20 years, the Tribe has constructed additional fencing and developed water sources to create eight range units. Due to concern for the perpetuation of the threatened LCT in Summit Lake and its tributaries, organized, permitted grazing has been limited on the Reservation since 1992. A revision of the Range Management Plan in 2013 in conjunction with NRCS and BIA recommended a stocking rate of 300 animals for a six month (June 1- December 1) season of use (Novak-Echenique and Youmans 2013). (See Appendix B for Range Unit Map).

Additionally, some hay has been cultivated on the Reservation in riparian areas and irrigated fields. In 1937, an irrigation system was constructed by the Indian Irrigation Service to allow Tribal members to use water from Mahogany and Snow Creeks for hay fields and personal gardens. Rough surface conditions make the use of farming equipment on the Reservation difficult, and no large-scale agricultural operations have been undertaken.

To further define how land on the Reservation will be used in the future, the Tribe adopted the Summit Lake Paiute Tribe Land Use Plan in 2000. This plan describes conditions and land uses on the Reservation at that point in time, and lays out a plan for future land use and a development strategy (Land Use Plan Maps are in Appendix C) (Lumos and Associates 2000).

## **Current land ownership descriptions**

Most of the Reservation lies within the Summit Lake watershed (comprised of Snow Creek and Mahogany Creek), which contains roughly 36,870 acres. The land in the Summit Lake watershed is owned and managed by several different entities, including the Tribe, BLM, USFWS, and

private landowners (Land Ownership Map is in Appendix D). Uniquely, the Reservation is surrounded by approximately 2.5 million acres of protected federal lands, including the Sheldon National Wildlife Refuge, 10 wilderness areas composing part of the Black Rock Desert – High Rock Canyon Emigrant Trails National Conservation Area, and the Lahontan Cutthroat Trout Natural Area. These protected lands have helped the Reservation preserve the natural ecologic state.

The Reservation entirely encompasses the waters of Summit Lake, a terminal lake, which is the geographic and cultural center of the Reservation. One parcel of land immediately adjoining the lake is privately owned by a non-tribal member. This land, located in Section 36 of Township 42 North, Range 25 East, Mount Diablo Base and Meridian, Nevada, represents the only area of the lake shoreline designated as non-Tribal land, and is referred to by Tribal members and managers, and in this report, as the “water gap.” This land is permitted by BLM for grazing, which is the primary use for a 1-mile stretch of lake shoreline contained within this land parcel. With fluctuating water levels in the lake, cattle walking through the lake and around the fence and trespassing onto Reservation land has been a persistent problem. Additionally, this water gap provides opportunities for trespass cattle from fields adjacent to the privately owned parcel, as well as wild horses from adjacent BLM-managed lands to also access the lake shoreline and in trespass, drink from the lake. Water quality tests at this location have historically been the poorest quality of all monitored sites (Summit Envirosolutions 1998 quoting unpublished report).

### **Current Land Uses**

Reservation lands are highly valued by Tribal members for the variety of uses they offer. Preserving the opportunity to use the land as described below is extremely important.



**Figure 3.** A Lahontan cutthroat trout captured at the fish trap.  
members today.

### **LCT Fishery**

The LCT fishery of Summit Lake and Mahogany Creek is important for both cultural and environmental reasons. In their native tongue, Summit Lake Paiute Tribal members are known as “Agai Panina Ticutta,” or “trout lake eaters” (Stewart 1939). Their name reflects the importance of LCT to the people as a source of identity, food, and traditional subsistence living. This connection is not just an historic one; it remains extremely important to Tribal

In 1975, LCT were classified as threatened pursuant to the Endangered Species Act. Summit Lake’s LCT are well known for being the largest self-sustaining lacustrine population of these fish left in its native range (USFWS 1994). Lahontan cutthroat trout occupy approximately 90% of the Summit Lake basin. Protection of Tribal waters is critical to providing habitat for LCT.

### **Traditional and Cultural purposes**

The Reservation is located in a small portion of the Summit Lake Paiute Tribe's estimated 2,800 square mile aboriginal homeland. Tribal members use both the land and waters on the Reservation for traditional and cultural purposes. Important cultural land uses include gathering traditional foods and medicines for subsistence living and religious ceremonies. The waters of Summit Lake, One Mile Spring, Mahogany and Snow Creeks are also culturally important and are used in religious ceremonies, for cleansing, and other related purposes. Other traditionally and culturally important activities supported by the Reservation are hunting and fishing opportunities available to Tribal members. Many Tribal members rely on the Reservation's traditional wildlife resources and annual hunting and fishing trips to supplement their family's food supply.

### **Recreation**

Tribal members also use the Reservation for many recreational uses, including camping, hiking, picnicking, wildlife viewing, and enjoying scenic and historic sites.

### **Grazing**

Although cattle have not been permitted to graze the Reservation in many years, wildlife such as pronghorn antelope and deer, as well as trespass wild horses from adjoining BLM lands do currently graze the Reservation range. The Tribe has expressed interest in exploring the possibility of reinstating cattle grazing on the Reservation. To allow both large-scale grazing and the protection of water resources on the Reservation from NPS pollution caused by livestock in water bodies, grazing exclosure fences have been constructed along the shorelines of Summit Lake and Mahogany and Snow Creeks to keep livestock and wild horses from accessing them. A similar fence is planned for construction around One Mile Spring but has not yet been constructed. To provide water where access has been fenced off, alternate water sources in the form of livestock and wildlife water facilities have been constructed outside the grazing exclosures.

### **Residential Tribal Members**

Some Tribal members make their seasonal homes on the Reservation when weather and road access permits. These homes are single-family dwellings, usually frame or mobile trailer homes, and are scattered throughout the Reservation. Most of these homes have pit privy waste disposal systems and some have private wells.

### **Facilities**

The Tribe maintains several buildings in an area known as the Tribal compound area (Compound), which is a mixture of frame and mobile trailer structures. These buildings include two Tribal Administration trailers, three trailers for Tribal employee housing, and a bunkhouse, two cabins for Tribal members to stay in, a well house, a shop, two multi-purpose sheds, a pesticide shed, a generator building, an equipment shed, and the fish trap on Mahogany Creek.

Other facilities on the Reservation and outside of the Compound include a hatchery building now converted to office space near One Mile spring, a spring house at One Mile Spring, historic ruins from Fort McGarry, a boating equipment storage shed, a cemetery, an unimproved landing strip, and two closed dump sites.

## Water Resource Descriptions

### Surface Water

Water resources on the Reservation occur as both ground and surface water. Most of the known water on the Reservation is in the form of surface water, and appears perennially a lakes, creeks, and springs. The table below shows total miles or acres of surface water on the Reservation.

*Table 1. Table showing basic land and water values for the Reservation.*

Topic	Value
Reservation Surface Area	10,863 acres
Total Miles of Perennial Streams	6.42 miles
Total Miles of Intermittent Streams	20.95 miles
Total Miles of Drainages (includes perennial and intermittent stream drainages)	54.7 miles
Number of Lakes	1
Total Acres of Lake	600-900 acres (depending on climate)
Number of Named Springs	4

All waters on the Reservation are used for various activities, including drinking water, aquatic life support, recreation, cultural purposes, wildlife and livestock habitat, agriculture, and subsistence living. The uses for each water body are described in the tables below.

The Summit Lake watershed peaks at an elevation of approximately 8,800 feet above sea level, and is within U.S. Geologic Survey Hydrographic Unit 16040202. Although it comprises less than 1% of the hydrologic unit, approximately 80% of the Reservation lies within the Summit Lake watershed (Summit Envirosolutions 1998).

#### *Summit Lake*

The main surface water body on the Reservation is Summit Lake, located approximately in the center of the Reservation. Summit Lake is a dimictic, high desert, terminal lake, located in a valley at an elevation of 5,700 feet above sea level. The size of the lake varies dependent on climate, but averages between 600 and 900 acres. The lake formed over 7,840 years ago when a landslide blocked the Snow Creek-Soldier Creek drainage at what is now the south end of the lake (Curry and Melhorn 1990). The lake itself is fairly shallow, with an estimated average depth of 5 to 6 meters, and is 14 meters at the deepest point (Summit Envirosolutions 1998). Summit Lake is fed by two perennial stream systems or sub-watersheds, Mahogany Creek and Snow Creek. Although Summit Lake is contained within Reservation boundaries, the headwaters of these tributaries are off the Reservation on lands managed by the BLM.



**Figure 4.** Summit Lake.

### *Mahogany Creek*

The Mahogany Creek sub-watershed includes a perennial tributary, Summer Camp Creek, and an intermittent tributary, Pole Creek. Mahogany Creek is the main tributary to Summit Lake, and flows into the lake in its northeastern portion.



**Figure 5.** Mahogany Creek.

Only 4.5 miles of this creek are within Reservation boundaries. Its headwaters originate off the Reservation on BLM managed land, which it flows through until reaching the Reservation boundary and then into Summit Lake. The portion flowing through BLM managed lands is on public land and open to activities such as camping, hunting, and all-terrain vehicle use to name a few. Several primitive campsites along Mahogany Creek are used seasonally but intensively.

In addition, herds of wild horses frequent the riparian corridor of Mahogany Creek on public lands. Trespass cattle can also be found in the sub-watershed.

The water quality of Mahogany Creek is of great concern to the Tribe because it is not only the largest tributary to the lake, but it is also the primary spawning area for LCT.

### *Snow Creek*

Snow Creek is a second tributary to Summit Lake, and enters it in the lake's southeastern portion. Snow Creek is the only other potential spawning habitat for LCT. However, since the creek currently flows through a broad meadow before entering the lake, there is no defined channel for fish access. A small population of LCT reside in Snow Creek, but adfluvial behavior is not confirmed. There are 1.96 miles of defined, perennial Snow Creek channel within the Reservation boundary.

The headwaters of Snow Creek originate to the east, on BLM public lands. These lands are open to the public for recreational activities, and campers and hunters on all terrain vehicles are often encountered. Herds of wild horses and trespass cattle are also often present in the sub-watershed.



**Figure 6.** One Mile Spring springhouse and water access pipe.

#### *One Mile Spring*

One Mile Spring is an important water source for drinking water and for cultural reasons. Located north of Summit Lake in the north central portion of the Reservation, the springhead is enclosed with a small roofed structure, and water is accessed from a plastic pipe through which water flows in a southerly direction. Traditionally, this was the primary source of drinking water for Reservation residents, although in the recent past, water quality analysis has revealed high levels of total coliform bacteria near the spring, and residents no longer use it for drinking water purposes.

However, One Mile Spring is still an important cultural resource, and Tribal members utilize it for traditional religious practices. The spring also is a source of water for wildlife in the area, including coyote, deer, pronghorn antelope, and sage grouse.

#### *Tule Spring Complex*

The Tule Spring Complex is located south of Summit Lake in the south central portion of the Reservation. This complex is composed of a springhead, and two subsequent, separate areas of surface flow which appear to be connected to the springhead underground. Flow rates for the spring are dependent on seasonal changes in water runoff. The spring complex is a water source for wildlife and trespass wild horses that frequent the area. The spring complex was assessed in 2011, and exhibited signs of severe overuse by wild horses and trespass cattle.

#### *Slide Spring*

Slide Spring is located south of Summit Lake in the southeastern portion of the Reservation. It consists of a spring head, channel, and terminates in a wetland area with two ponded areas. A preliminary water quality analysis revealed that the water quality at the headwaters was very good. Although this spring was not previously named as an important cultural resource on the Reservation, this may be due to its remote location compared to other springs. The spring was assessed in 2011, and a wide variety of wildlife was observed using the area, including wild horses. Wild horses have severely damaged the springhead and wetland portions of the spring.

#### *Lakeview Spring*

Lakeview Spring is located west of Summit Lake in the west central portion of the Reservation, just north of Section 36. Currently, this spring is located on a Tribal land assignment which has a fence around the boundary of the assignment. This fence has successfully protected this springhead from use by wild horses which are frequently in the area. The spring consists of a springhead and short channel. A former land assignee attempted to develop this springhead in the early 1980s but that activity does not seem to have permanently impacted the spring. This spring

was formerly unnamed prior to an assessment in 2011, and was found to be in fairly good condition.

*Other sources*

Several unnamed seeps, springs, and intermittent streams also exist on the Reservation (Figure 7), including runoff from the Black Rock Range between Mahogany and Snow Creeks. However, these water bodies only exist during high precipitation years and any pollutants entering the Summit Lake system from these sources would depend on drainage patterns. No research has been done to identify water quality or identify uses.

DRAFT

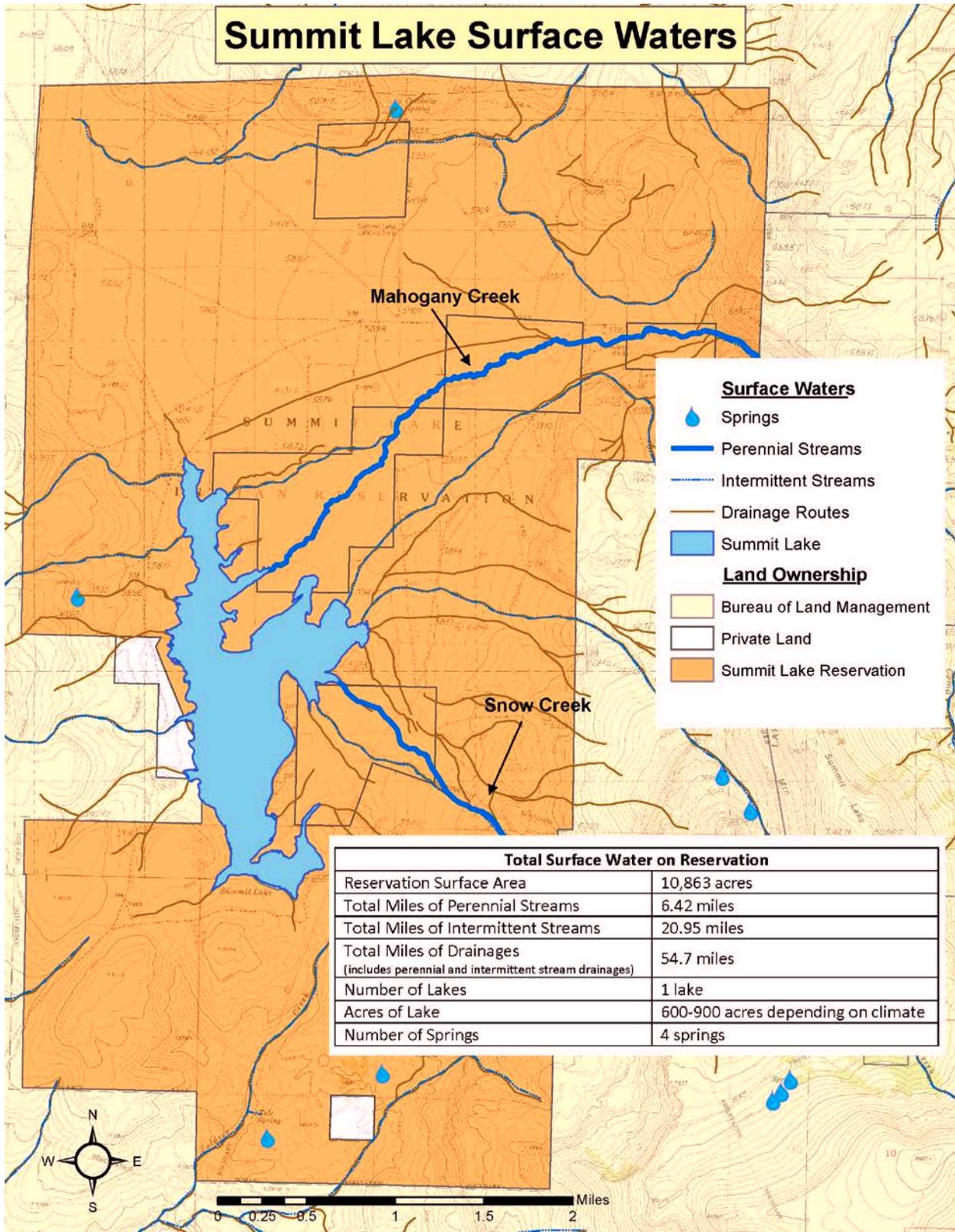


Figure 7. Surface waters of the Reservation.

**Table 2.** Table summarizing water quality concerns by surface water source on the Reservation.

<b>Water Source</b>	<b>Size Within Reservation</b>	<b>Location Description</b>	<b>Uses</b>	<b>Water Quality Concerns</b>
Summit Lake	600 acres (variable)	Approximately in the center of Reservation	Aquatic life support, drinking water supply, fish consumption, primary contact recreation, secondary contact recreation, wildlife habitat, culture	Nutrients, coliform, turbidity, sedimentation, temperature
Mahogany Creek	4.5 miles	Northeastern Reservation boundary to Summit Lake	Aquatic life support, drinking water supply, fish consumption, primary contact recreation, wildlife habitat, culture, agriculture	Nutrients, coliform, turbidity, sedimentation, temperature
Snow Creek	1.96 miles	Eastern Reservation boundary to Summit Lake	Aquatic life support, drinking water supply, fish consumption, primary contact recreation, wildlife habitat, culture, agriculture	Nutrients, coliform, temperature
One Mile Spring	N/A	North-central Reservation boundary	Aquatic life support, drinking water supply, wildlife habitat, culture, agriculture	Nutrients, coliform
Tule Spring	N/A	South-central portion of Reservation	Aquatic life support, wildlife habitat, culture	Nutrients, coliform, turbidity
Slide Spring	N/A	Southeastern portion of Reservation	Aquatic life support, wildlife habitat, culture	Nutrients, coliform, turbidity
Lakeview Spring	N/A	West-central portion of Reservation	Aquatic life support, wildlife habitat, culture	Nutrients, coliform
Unnamed Springs and Seeps	N/A	Throughout Reservation	Aquatic life support, wildlife habitat, culture	Nutrients, coliform

Source: SLPT 2008, edited for 2015 revision

### **Ground Water**

The Reservation also utilizes some ground water as a water resource. Historically, this has not been pursued due to financial and mechanical constraints related to estimated depth to groundwater. However, recent exploration yielded evidence that depth to water may not be as deep as previously thought, and ground water use may be a viable resource. Groundwater is tapped by several wells drilled for domestic and livestock/wildlife use.

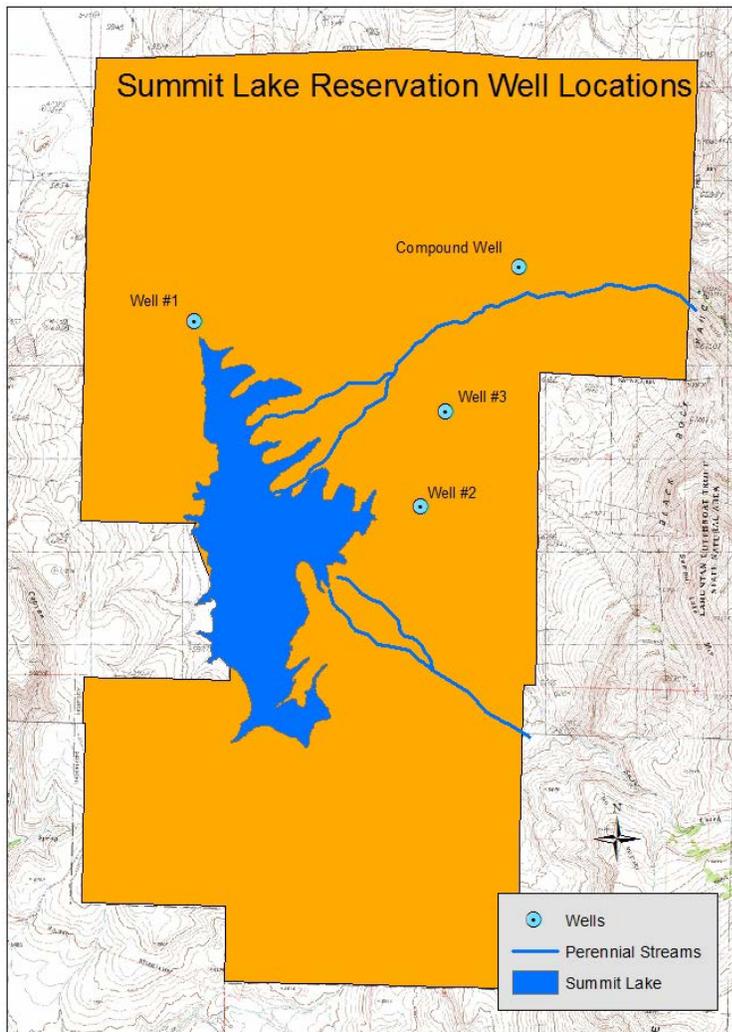
#### *Compound Well*

The Compound Well is located within the Tribal Compound, and currently serves as a water source for five mobile homes used for Tribal administration and employee housing. All mobile

homes are plumbed with a sink, shower, and flush toilet, and a kitchen sink is plumbed in four of the five mobile homes. The well reportedly has no sanitary seal, and historic bacteriological tests have revealed a high level of total coliform bacteria present in the water. In addition, high levels of iron are present, resulting in a sulfur odor and rust-colored hue to the water. The water is considered unsafe for drinking at this time, but suitable for showering and dish washing. The well is suspected to be hydraulically connected to Mahogany Creek, and lies within the creek's 100-year floodplain. It is believed that this well test pumped at a rate of 30 gallons per minute.

*Well #1*

Well #1 is located north of Summit Lake and was drilled in 2009 with funds from an EPA CWA



Section 319 Nonpoint Source Pollution grant. The drilling crew tapped water at about 60 feet below the ground surface and the well test pumped at 38 gallons per minute. The well is around 120 feet deep. This well has a sanitary seal and was drilled to serve a livestock water facility installed nearby in fall 2010. It is also connected to the Reservation's electric power grid.

*Well #2*

Also drilled with EPA CWA Section 319 Nonpoint Source Pollution grant funds, Well #2 was drilled east of Summit Lake in 2009, and was test pumped at 17 gallons per minute. Water was tapped at around 60 feet below the ground surface and a sanitary seal was installed. The well is around 120 feet deep. In summer of 2014, a solar powered well pump was installed, and the well was connected to serve a nearby livestock water facility.

*Well #3*

Well #3 is also located on the eastern side of Summit Lake. It was also drilled in 2009 with EPA CWA Section 319 funds. Water was also tapped at around 60 feet below ground surface. The well is approximately 120 feet deep with a sanitary seal, and test pumped at 36 gallons per minute. It was connected to the power grid and was drilled to serve livestock water facilities constructed in fall 2010.

**Table 3.** Table summarizing water quality concerns by ground water source on the Reservation.

<b>Water Source</b>	<b>Location description</b>	<b>Uses</b>	<b>Water Quality Concerns</b>
Compound Well	Tribal Compound in north central portion of Reservation	Drinking water supply	Nutrients, coliform, turbidity
Well #1	North of Summit Lake	Wildlife and livestock water source	Nutrients, coliform
Well #2	East of Summit Lake	Wildlife and livestock water source	Unknown, not yet tested for any parameters
Well #3	East of Summit Lake	Drinking water supply, wildlife and livestock water source	Nutrients, coliform

Source: Created for this Plan

## **CHAPTER III: NONPOINT SOURCE MANAGEMENT CONCERNS**

NPS pollution occurs when rainfall, snowmelt, or irrigation water runs over land or through the ground, picks up pollutants, and transports them into surface or ground water (EPA 2010). Sources both on and off the Reservation have contributed to the addition of NPS pollution to Reservation waters. NPS pollution, in turn, has contributed to other water quality impairments and degraded water quality in bodies of water on the Reservation. NPS pollution comes in many forms, and can include sedimentation, bacteriological, nutrient, and other categories.

### **NPS Sources and Contributors**

Since the Reservation boundary does not encompass the entire Summit Lake watershed, sources both on and off the Reservation contribute to NPS pollution in Reservation water bodies. The following table summarizes the sources described in more detail below.

Table 4. NPS categories and subcategories and where they are a source of concern.

<b>NPS Category</b>	<b>NPS Subcategory</b>	<b>Concern On Reservation</b>	<b>Concern Off Reservation</b>
Agricultural Activities	Crop Production	X	
	Grazing and Watering-Related	X	X
Infrastructure	Transportation Corridors	X	X
	Human Activities in Concentrated Areas	X	
	Waste Management		X
	Rodents	X	
Water Quantity	Reduced Water Quantity	X	X
Loss of Healthy Functioning Ecosystems	Invasive Species	X	X
	Loss of Streambank Vegetation and Stability	X	
	Cataclysmic Events		X

#### **A. On-Reservation Sources and Concerns**

Sources of NPS pollution occur both on the Reservation and on the lands within the watershed not contained within the Reservation boundary. There are several possible sources of NPS pollution within the Reservation boundary. These include agriculture, grazing, transportation corridors, human activities, water quantity, and loss of healthy functioning ecosystems.

#### **1. AGRICULTURAL ACTIVITIES**

Historic agricultural operations including hay production and livestock grazing were important land uses on the Reservation. Although not currently conducted, commodity or forage crop production and livestock grazing on the Reservation have been major contributors of NPS

pollution and degraded water quality in the past. However, the presence of present-day trespass livestock and wild horses has made this category of NPS pollution one of the most visible and most concerning on the Reservation. These sources are also likely to continue to be contributors in the future.

✦ *Potentially affected water bodies:* Summit Lake, Mahogany Creek, Snow Creek, One Mile Spring, Tule Spring, Unnamed Springs and Seeps

✦ *Water quality parameters used for evaluation:* phosphorus, nitrates, bacteria, TSS, TDS

*a. Crop production*

Agricultural crop production operations, especially any taking place near bodies of water, are notorious contributors to NPS pollution through the addition of sediment and nutrients to the water. Sediment enters the water when machinery works close to a stream bank or when vegetative cover is removed to plant crops, leaving soil bare for extended periods of time when a heavy precipitation event could wash sediment into a water body. Nutrient loading is also a concern near operations where fertilizers used on field crops can be carried into a body of water during precipitation events.

*b. Grazing and Watering-related sources*

Although permitted grazing has not occurred on the Reservation in recent years, the range is still used by wildlife and BLM wild horses, which have recently been found regularly on the Reservation and in large numbers. Feral horses particularly increase NPS pollution by removing stream bank vegetation, defecating in the stream, and repeatedly moving through the water body. Especially when an area is overgrazed, loss of vegetation or severe impacts to understory and mid-story vegetation layers can occur, leading to decreased soil stability, especially in riparian areas. Additionally, soil compaction is a concern where animals congregate, making it more difficult for stream bank vegetation to recolonize. Livestock and feral horses repeatedly entering and exiting water bodies defecating and dislodging sediment from the stream bottom further increase NPS pollution and decrease water quality.

Surface waters that are heavily used by grazing animals have particular concerns. Bacteriological assessments through water quality monitoring demonstrate exceedances in CWA limits for E. coli, total coliform, and fecal coliform. Although human waste containment areas such as privies can contribute to the higher levels of bacteria found in water sources, ungulate, wild horse, and livestock grazing is a more likely source of these bacteria on the Reservation.

Wild ungulates such as deer and antelope also utilize the Reservation range, and often browse in riparian areas and access Reservation water bodies as water sources. Since they are more mobile, their grazing habits are less detrimental than those of livestock and feral horses, and they better disperse grazed areas and fecal matter, they are considered minimal but probable contributors to the coliform bacteria found in Reservation waters.



**Figure 9.** Damage to the lower Mahogany Creek grazing enclosure by wild horses in winter 2009-2010 included trampled banks, heavily grazed vegetation, and a high density of feces.

## **2. INFRASTRUCTURE**

There are several roads on the Reservation, some that are entirely contained within the Reservation boundary, and others that lead onto the Reservation from elsewhere. Since these roads are graded high alkali, fine particulate soil and gravel, they are highly erosive during storm events and may be sources of NPS pollution. Additionally, two centers of human activity on the Reservation are located very near bodies of water.

✦ *Potentially affected water bodies:* Summit Lake, Mahogany Creek, Snow Creek, One Mile Spring

✦ *Water quality parameters used for evaluation:* phosphate, nitrates, bacteria, TSS, TDS

### *a. Transportation Corridors*

In areas where roads cross low-lying areas or pass through areas inundated during high stands of the lake, water covering the roadway is not uncommon. In locations where ditches have been dug alongside the road, in snowmelt or heavy runoff conditions, water often overflows the ditch and instead uses the road as a conveyance location. Annual complete or partial washouts of roads are not uncommon.

Additionally, storm events can wash any substances on the road deposited by vehicular traffic into nearby water bodies or onto land adjacent to the road. These substances can include oil, gasoline, and other fluids from vehicle engines, and things deposited on the roadway from vehicle tires, such as tar from paved roads and especially noxious weed seeds. Noxious weeds can directly impact water quality if established, and management of any established populations

of weeds increases the likelihood of additional contaminants such as herbicides and adjuvants entering the water body.

*b. Human activities in Concentrated Areas*

The Compound is an area in the north-central part of the Reservation where multiple buildings are located that are used for administration of tribal programs, public meetings, employee housing, and storage of equipment. It is situated in its current location along Mahogany Creek and in the 100-year floodplain because the first buildings constructed there were the Fish Trap on Mahogany Creek and a multi-purpose building to house employees working at the Fish Trap. This became the center of activity for resource management projects and public meetings, and additional buildings were subsequently constructed at that location.

Because the Compound is located so close to Mahogany Creek and receives heavy human activity use, there are several NPS pollution source concerns. One is vehicular traffic on the roads in the Compound. Erosion due to frequent use and the possible deposition of oil, gas, and other engine fluids onto the roads is a concern. Dust created by the use of these roads can be deposited in nearby Mahogany Creek.

Another concern is waste and wastewater disposal. Mobile homes that house employees during the season are plumbed with running water, toilets, showers, and sinks. These are all connected to septic systems. However, there is still concern about grey water products being disposed of on the ground by those camping or living in the bunkhouse or cabins; which are not plumbed. All grey water produced in these locations from washing dishes or personal hygiene are disposed of by dumping on the ground.

A second area with concentrated human activity on the Reservation is the One Mile Office Building located near One Mile Spring. This former fish hatchery building was converted to office space following the end of fish culture activities on the Reservation. Concerns stemming from human activity in this location include vehicular traffic on an old, abandoned road that crosses the spring outflow, dust deposition from the currently used road, and wastewater disposal as there is currently no septic system to accept waste of any type at this facility.



**Figure 10.** Some of the buildings in the Tribal Compound area.

### *c. Rodents*

Due to the remote and relatively undeveloped nature of the Reservation, rodents are drawn to areas of infrastructure for shelter. Of particular concern are wood rats or "pack rats," which can be extremely destructive and build middens in undesirable locations, and deer mice, which can carry hantavirus in their droppings. Pack rats have been known to build middens in vehicle engines that have been idle for just a few days, and have been responsible for chewing through electrical wires on several occasions. If either of these types of rodents take up residence in a structure, their droppings can contribute coliform bacteria to water sources. This is a problem specifically in the Fish Trap, shop, mobile home residences, and One Mile Springhouse; and could also affect the Compound Well if they took up residence in the well house structure and were able to access the well casing.

## **3. WATER QUANTITY**

Declining water quantity is always a concern in desert environments where water is scarce to begin with and often in high demand for various uses.

- ✦ *Potentially affected water bodies:* Summit Lake, Mahogany Creek, Snow Creek, One Mile Spring, Tule Spring, Lakeview Spring, Unnamed Springs and Seeps
- ✦ *Water quality parameters used for evaluation:* temperature, nutrients

### *a. Reduced water quantity*

Reduced water quantity in a water body, either intentionally (e.g. diversions) or unintentionally (e.g. drought), can influence NPS pollution occurrence in water bodies. When less water is available for any reason, the NPS pollution in a water body becomes more concentrated, increasing levels of nutrients and increasing temperature. In 1937 the Indian Irrigation Service constructed an irrigation system to provide water from Mahogany Creek to Tribal members for use in their hay fields and on their gardens. These diversions significantly lowered the quantity of water available in water bodies, and most likely lowered the quality of the water left in the creek. Although not currently in use, the presence of these diversions could still allow irrigation to take place in the future and affect water quantity. Additionally, natural occurrences such as drought and global climate change can greatly affect precipitation patterns, which in turn, affect water quantity in water bodies either directly through runoff or through snowpack.

## **4. LOSS OF HEALTHY FUNCTIONING HABITATS**

Encouraging healthy functioning riparian and wetland habitats are crucial to reducing NPS pollution. Their degradation diminishes the natural buffer between the water body and potential NPSs, allowing NPS to reach the water body much more easily.

- ✦ *Potentially affected water bodies:* Summit Lake, Mahogany Creek, Snow Creek, One Mile Spring, Tule Spring, Lakeview Spring, Unnamed Springs and Seeps
- ✦ *Water quality parameters used for evaluation:* temperature, nutrients, bacteria



**Figure 11.** A meadow of invasive Hoary Cress on the Reservation.

*a. Invasive Species*

Both vegetative and aquatic invasive species can be detrimental to healthy functioning habitats. Whenever there is an opportunity, they out-compete native flora or fauna and establish themselves as a part of the habitat. However, in the case of aquatic invasive species, they can modify the food chain to the point where it can no longer support both the native and introduced species, and often the native species dies out from the competition. This change influences the balance of the entire ecosystem, which can change dramatically from the introduction of an invasive aquatic species.

Vegetative invasive species are also a threat to healthy functioning habitats. Invasive plants are especially

destructive in riparian areas, where entire reaches of a stream can become a monoculture of a single species of invasive plant. These plants often use more water than native species, impacting water quantity and lowering water quality, and have weaker root systems to prevent erosion along stream banks to prevent NPS pollution from entering the water body.

*b. Loss of stream bank vegetation and stability*

Stream bank stability and vegetation reflect the morphology of the stream. Natural stream morphology provides the right locations for healthy functioning habitats connected to that water body to flourish. If a stream has been altered and the form changed from its natural morphology; for instance if meanders were straightened, flow rates and velocity would increase, leading not only to increased erosion, but also making it difficult for healthy functioning habitats to exist. Furthermore, if too much stream bank vegetation is lost, erosion may increase due to a lack of root mass to hold the soil in place, and water temperature increases due to lack of shade.

**B. Off-Reservation Sources and Concerns**

There are several NPS pollution source concerns originating off the Reservation. Since the Tribe does not own all of the land encompassing the watershed, and the lands surrounding the Reservation are used and managed differently than lands included in the Reservation,

**1. AGRICULTURAL ACTIVITIES**

Some agricultural activities, mostly grazing-related, have been conducted in the upper watershed. These activities can increase NPS pollution downstream in water bodies on the Reservation.

✦ *Potentially affected water bodies:* Summit Lake, Mahogany Creek, Snow Creek

✦ *Water quality parameters used for evaluation:* phosphorus, nitrates, bacteria, TSS, TDS

*a. Grazing and Watering-related sources*

Just as overgrazing on the Reservation contributes to increased sedimentation, overgrazing in the upper watershed, off of the Reservation, is also a NPS pollution concern. Overgrazing in the riparian area removes vegetation and decreases floodplain functionality and overall watershed health. Increased sedimentation upstream leads to increased sedimentation downstream, meaning higher NPS pollution levels in Reservation water bodies connected to upstream areas subject to overgrazing.

Another NPS concern occurs when cattle are permitted or trespass onto BLM public land adjacent to the Summit Lake shoreline. Although the lake is under the management of the Tribe, there are insufficient fences to keep cattle from accessing the lake, or in low water years, from walking around the fence and onto the Reservation. Furthermore, federal policies are ineffective to enforce this trespass action. Due to the presence of water, this area also regularly attracts large herds of wild horses, and between horses and cattle, this riparian area is consistently overgrazed, causing erosion concerns in addition to the NPS concern of increased bacteria levels in the lake from livestock droppings.

## **2. INFRASTRUCTURE**

The major infrastructure off the Reservation that might increase NPS pollution in Reservation water bodies are roads. Roads off the Reservation are for the most part poorly maintained tracks made up of the same high alkali, fine particulate soil and gravel found on the Reservation. Additionally, a lack of formal infrastructure for waste management is an issue.

✦ *Potentially affected water bodies:* Summit Lake, Mahogany Creek, Snow Creek

✦ *Water quality parameters used for evaluation:* phosphate, nitrates, bacteria, TSS, TDS

### *a. Transportation Corridors*

In some locations, roads off the Reservation cross water bodies that flow onto the Reservation. These locations are subject to the same risks as transportation corridors on the Reservation, all of which increase NPS pollution. These risks include substances on the road being washed into the water body and carried ultimately into the lake, transport of invasive weeds and aquatic organisms, and road wash-outs loading the stream with sediment at that location.

### *b. Waste Management*

Due to the remote nature of the area upstream from the Reservation, no formal infrastructure has been established to deal with waste management for the public using the area to recreate. In the past, pit privies have been observed near or directly on upper Mahogany Creek at campsites located on BLM land and frequented by campers and hunters. An inventory of their presence was conducted in 2007 and is presented in Appendix E. In recent years, usage of the upper watersheds of Mahogany and Snow Creeks has



**Figure 12.** A makeshift privy at a BLM Mahogany Creek campsite.

exponentially increased. This has led to more intense use of existing campsites and the creation of new ones. Because of this, waste and trash management has become more of a concern.

### **3. WATER QUANTITY**

Water quantity in tributaries to Summit Lake off the Reservation directly impacts water quantity in water bodies on the Reservation. Since the headwaters of Mahogany and Snow Creeks are outside the Reservation boundary, the lake level is tied to water quantity off the Reservation.

✦ *Potentially affected water bodies:* Summit Lake, Mahogany Creek, Snow Creek

✦ *Water quality parameters used for evaluation:* temperature, nutrients

#### *a. Reduced water quantity*

There are currently no known upstream activities affecting water quantity. However, impacts from climate change and the natural variation in weather surrounding the Reservation affect the quantity of water available to flow into the lake. Additionally, water diversions for upstream water uses such as agriculture decrease available water downstream. There are currently no known upstream diversions in the Mahogany or Snow Creek watersheds.

### **4. LOSS OF HEALTHY FUNCTIONING HABITATS**

The existence of healthy, functioning habitats is important to reduce the amount of NPS pollution to enter the water and flow downstream to the Reservation.. Invasive species and cataclysmic events that cause vegetation loss and increased erosion can be important NPS pollution sources.

✦ *Potentially affected water bodies:* Summit Lake, Mahogany Creek, Snow Creek

✦ *Water quality parameters used for evaluation:* temperature, nutrients, bacteria

#### *a. Invasive Species*

NPS pollution caused by vehicles is also a concern. This includes invasive plants or aquatic organisms, which originate off the Reservation and may become attached to vehicles traveling to or through the Reservation, dropping off, and becoming established as an NPS concern. These organisms pose the same threat to upstream resources as on the Reservation, and can increase NPS pollution, degrade water quality, and decrease water quantity.

#### *b. Cataclysmic Events*

Storm water runoff from off-Reservation sources is an especially large concern when cataclysmic events such as 100 year floods high intensity wildfires, or denuding of upland vegetation has occurred prior to the heavy precipitation event. Any event that has caused bare soil to be exposed may cause increased NPS pollution in upstream water bodies, which travels downstream to the Reservation.

### C. Future NPS Concerns

The sources listed above are known to be problems at the time this document was written. However, the NRD is concerned that several other NPS sources could arise in the relatively near future.

*1. Increased input of NPS pollution into Mahogany and Snow Creeks from upstream sources and increased use of the upper watershed.* More people are becoming aware of the area around the Reservation and are using it for recreation. This means more vehicles crossing the stream, more use of roads resulting in more dust creation, more waste caused by camping and recreation, and more people wading in the stream causing more impacts to streambank vegetation.

*2. Growing potential for wildfire.* There have been few recent wildfires on the Reservation or in the surrounding region, and livestock grazing has been limited, so fuel loads are building up on and around the Reservation. These increased fuel loads could lead to a hotter-burning fire that wipes out critical vegetation, leaving the soil exposed and readily mobile during precipitation events. A heavy load of sediment entering the lake or creeks is a considerable NPS pollution concern.

*3. Effects of climate change.* Global climate change is a growing concern with far-reaching and somewhat unpredictable effects. Droughts may become more severe or seasonal precipitation patterns may result in more intense events. Native vegetation may thrive or be pushed out by invasive species; vegetation communities may change and become less able to reduce erosion. While the future effects of global climate change are unknown, it is possible that they may become an NPS pollution concern in the future.



**Figure 13.** Fuel loads are building up both on and off the Reservation, increasing the risk of wildfire and increasing chances of subsequent NPS sediment loading of water bodies.

## **CHAPTER IV: BEST MANAGEMENT PRACTICE**

### **RECOMMENDATIONS**

The Summit Lake Paiute Tribe currently implements several BMPs to control NPS pollution, including stream protection and stabilization, watering development, fencing and range management, and Tribal Water Ordinance No. VIII.

The Tribe is actively working to improve water quality on the Reservation and will continue to implement appropriate BMPs on the Reservation to reduce NPS pollution to these water bodies in the future. As well as implementing the BMPs listed below for the Reservation, the Tribe will work to develop additional BMPs, including the use of traditional and customary stewardship practices, and will also employ adaptive management in deciding implementation actions.

BMPs addressing off-Reservation NPS concerns are also suggested, but the Tribe recognizes that these NPS issues fall under the jurisdiction of the BLM, since they occur outside Reservation boundaries. The Tribe will seek opportunities to partner with the BLM to implement the suggested or other BMPs to protect the waters upstream of the Reservation in order to reduce NPS pollution concerns in water bodies on the Reservation. The table in Appendix F connects NPS sources, water bodies, recommended BMPs, and goals and objectives.

#### **On-Reservation Sources and Concerns**

##### Agricultural Activities

###### *Crop Production (when necessary)*

- Prohibit tillage within 20 feet of stream banks
- Maintain leveled fields to prevent excessive run-off during irrigation periods
- Maintain irrigation delivery channels or ditches to prevent erosion or ditch collapse

###### *Grazing and Watering-Related*

- Grazing enclosure fences must be constructed where necessary to keep livestock and feral horses away from sensitive riparian areas to prevent vegetation removal and wallowing in the water body. Condition of these grazing enclosure fences must also be inventoried and maintained regularly.
- Provide and expand alternate water sources away from sensitive riparian areas
- Perform annual inventory of boundary fence condition and repairs to keep wild horses and other stray livestock from entering the Reservation
- Perform annual inspection of cattle guards and repair and maintain as necessary to keep them in good condition.
- Work with the BLM to limit wild horse pressure on the lake and streams (See Appendix G for more details)

##### Infrastructure

###### *Transportation Corridors*

- Reroute roadways further from lake shorelines
- Increase opportunities to improve maintenance of roadways to limit sedimentation from storm water events

- Close roads of particular NPS concern
- Limit OHV/ORV use adjacent to waterways
- Monitor recreation passers-through to identify potential contributions to NPS due to increased awareness and visitorship
- Incorporate road improvements such as drainage retention basins and road realignments, away from water bodies in transportation plans.
- Educate Tribal members and the public about NPS pollution, reasons for road maintenance, rerouting, etc., when opportunities arise

#### *Concentrated Areas*

- Prevent construction of new pit privies  
Removal or upgrade retention of above ground fuel storage tanks in the Tribal Compound
- Improve facilities in the Tribal Compound to properly accommodate and contain grey water that currently is disposed of on the ground



**Figure 14.** Above ground fuel storage tanks in the Tribal Compound.

#### *Rodents*

- Rodent-proof structures by adding anti-burrowing materials to the outside of structures, filling holes, etc.
- Keep equipment and supplies stored outside neat and orderly to prevent midden construction
- Construct additional structures to protect equipment and vehicles from rodent access

#### Water Quantity

##### *Reduced water quantity*

- Increase knowledge on climate change issues, including modeling of specific effects on precipitation patterns and ecosystems in the Great Basin Desert region
- Improve collaborations with other entities focusing on monitoring climate change
- Monitor stream flows in Mahogany and Snow Creeks
- Monitor weather patterns in the region and develop a network of equipment to collect and analyze data on appropriate parameters

#### Loss of Healthy, Functioning Habitats

##### *Invasive Species*

- Continue eradication efforts for known invasive weed species on the Reservation such as hoary cress, perennial pepperweed, Canada thistle, and other species determined to be invasive, non-native weeds
- Monitor for aquatic invasive species such as quagga mussels and Asian clams that can be transported to Reservation waterways via biomaterials on vehicles, boats, and through other methods

##### *Stream bank vegetation and stability protection*

- Monitor stream morphology for proper sinuosity, floodplain considerations, flow regimes, etc., to maintain healthy form
- Inventory streambank condition and restore stability to vulnerable or eroded areas.
- Plant vegetation in areas where it may have been lost due to grazing, invasive species, or other disturbances to replace the root mass stabilizing the banks

## **Off-Reservation Sources and Concerns**

### Agricultural Activities

#### *Grazing and Watering-Related*

- Talk with other watershed users regarding grazing and watering uses, develop a watershed-wide agreement

### Infrastructure

#### *Transportation Corridors*

- Improve locations where roads cross water bodies, either by rerouting or design change
- Close roads of particular NPS concern
- Limit accessibility of OHV/ORV use adjacent to waterways
- Monitor recreation passers-through to identify potential contributions to NPS due to increased awareness and visitorship
- Educate the public about NPS pollution, reasons for road maintenance, rerouting, etc., when opportunities arise

#### *Waste Management*

- Work with BLM to develop and implement a waste management program for the Summit Lake watershed.
- Educate the public about NPS pollution and the impact their actions have on the surrounding water bodies when opportunities arise

### Water Quantity

#### *Reduced water quantity*

- Increase knowledge on climate change issues, including modeling of specific effects on precipitation patterns and ecosystems in the Great Basin Desert region
- Improve collaborations with other entities focusing on monitoring climate change
- Outreach to other watershed users to develop a watershed-based water quality monitoring plan.
- Monitor weather patterns in the region and develop a network of equipment to collect and analyze data on appropriate parameters
- Educate the public about water quality monitoring.

### Loss of Healthy Functioning Habitats

#### *Invasive Species*

- Outreach to watershed users regarding invasive aquatic and vegetative species and develop a watershed-based plan to prevent the spread of and implement management of invasive species.
- Educate the public about the problems invasive weeds can cause and encourage them to try and minimize introduction of these species into the watershed

#### *Cataclysmic Events*

- Outreach to other watershed users to develop a watershed-based plan that contains management actions for implementation by all stakeholders should a cataclysmic event occur in the watershed

#### **Future NPS Concerns**

##### Increased input of NPS pollution into Mahogany Creek from upstream sources

- Education of the public
- Improved road crossings and campsites
- Limit off road vehicle use, especially when ground is wet and erosion or streambank collapse could take place, or when dry and excessive dust could be created
- Closing the area to recreation

##### Growing potential for wildfire

- Fuel reduction efforts on the Reservation and in surrounding watershed
- Creation of fire breaks in strategic areas on the Reservation

##### Effects of Global Climate Change

- Increase knowledge on climate change issues, including modeling of specific effects on precipitation patterns and ecosystems in the Great Basin Desert region
- Improve collaborations with other entities focusing on monitoring climate change
- Monitor weather patterns in the region and develop a network of equipment to collect and analyze data on appropriate parameters

## CHAPTER V: CONCLUSIONS AND FUTURE ACTIVITIES

### Conclusions

The Tribe's NRD employs a number of well-qualified people able to carry out the projects described in this plan. Year round full time NRD employees include a Director, Environmental Specialist, and Fish and Wildlife Biologists; and a seasonal staff including one or more Maintenance Workers, Watershed Monitors, and various Natural Resources Technicians to assist with noxious weed treatment, and fish and wildlife surveys. Other seasonal staff may also be hired depending on projects planned for implementation. When additional expertise is needed, the NRD will contact and work with appropriate staff from federal and state agencies, nonprofit organizations, and private consultants.

This document should be viewed as a living document. The development and implementation of BMPs is an ongoing process to identify and develop improved, science-based BMPs to enhance and protect the waters of the Reservation. This collection of BMPs will need to be revisited, reviewed, and modified over time as new information becomes available.

### Multi Phased Approach

Since 2009 the Tribe has implemented a multi-phase approach to achieve the goal of eliminating NPS pollution from livestock grazing the riparian zone, lake shorelines and associated upland areas. Phases One and Two of the multi-phase approach constructed grazing exclosure fences to protect shorelines of Summit Lake and the Snow Creek riparian corridor, and drilled three wells to serve alternate livestock water facilities outside those fences. Mahogany Creek was already protected from a previously constructed grazing exclosure fence. Additionally, a solar powered livestock water facility using Summit Lake water was installed south of the lake to complete Phase Two in 2014. The third phase of this project was begun in 2011 and will continue into future. This phase addresses repairing, rebuilding, and maintaining the Reservation boundary fence to keep trespass BLM wild horses from straying onto the Reservation. Phase Four focuses on protecting springs on the Reservation from grazing impacts and other destructive activities, such as driving vehicles up to the spring head. Phase 5 is the regular maintenance of Reservation fences and other range improvements. Phase 6 will be defined as additional needs are discovered.

This multi-phased approach described above has been implemented to address grazing and watering-related NPS concerns. It is important to recognize that these are not the only NPS concerns on the Reservation, and that additional BMPs and future projects addressing other NPS pollution source concerns are also listed in this document.

Table 5. Activities undertaken during each phase of implementation to eliminate NPS pollution from livestock grazing in the riparian areas on the Reservation. In the table below, an "X" indicates completion, "P" indicates in progress, and "N" indicates a need.

Phase	Activities	Funded	Implemented
Phase 1	Construct fence protecting north and west sides of Summit Lake	X	X
	Construct fence protecting east side of Summit Lake and north side of Snow Creek	X	X

	Drill well to serve livestock water facilities	X	X
	Install livestock water facilities	X	X
Phase 2	Construct fence protecting south side of Snow Creek and south side of Summit Lake	X	X
	Install livestock water facility pumping water from Summit Lake to area south	X	X
Phase 3	Repair of Reservation boundary fence, including replacement of all wooden posts and braces with metal, reconstructing portions where necessary	X/N	P
Phase 4	Protection of One Mile Spring	X	P
	Protection and restoration of other Reservation springs and seeps	N	
Phase 5	Regular maintenance of Reservation fences	N	
	Regular maintenance of Reservation cattle guards	N	
	Regular maintenance of livestock water facilities	N	
Phase 6	Other activities as necessary	N	

The future project possibilities listed below are examples of activities that could be implemented under Phase 6. This list is not intended to be comprehensive, and should be added to and edited as needed and as Tribal priorities change.

### **Future Nonpoint Source Pollution Project Possibilities**

There are a wide variety of projects that could be implemented on and in conjunction with land owners surrounding the Reservation to identify, address, and mitigate some of the NPS pollution concerns named previously in this document. However, implementation of these projects and the Tribe's ability to continue to address NPS pollution on and around the Reservation depends solely on obtaining funding from outside sources. Without additional financial help, the Tribe's efforts to protect Reservation water bodies from both on and off Reservation sources of NPS pollution will cease. The list below outlines some NPS projects that could be implemented when additional funding is secured.

- ◆ Install septic at One Mile Spring office building and at other structures on the Reservation where there is currently no waste management system
- ◆ Repair or reconstruct One Mile springhouse to prevent rodent access and install fence to prevent vehicular access
- ◆ Remove or replace instream culverts or those at road crossings and restore stream as needed
- ◆ Remove defunct irrigation turn-outs, many of which are on the verge of collapse
- ◆ Improve or reroute roads to prevent runoff into lake (i.e. install retention basins, etc.)
- ◆ Improve necessary vehicular road crossings

- ◆ Expand or add additional livestock/wildlife water sources where necessary on Reservation Fence off spring heads to prevent livestock and wild horse access or find alternate conservation methods to protect these fragile areas on the Reservation
- ◆ Assess and inventory springs and seeps on the Reservation, monitor for overuse, restore where appropriate
- ◆ Stream survey and assessment
- ◆ Proper functioning condition / Fishery scale assessment
- ◆ Update off-Reservation assessment of NPS sources
- ◆ Geomorphic assessment of watershed to minimize sedimentation and engineer for stability and to provide fish passage and nursery; restore as identified in assessment
- ◆ Rapid Bioassessment study on stream reaches
- ◆ Network with surrounding land managers and other conservation organizations to identify and address NPS and other conservation concerns
- ◆ Draft/Develop watershed-based plan with surrounding land managers
- ◆ Develop Tribal NPS Ordinance or revise Tribal Ordinance No. VIII to more adequately address Tribal needs
- ◆ Annual inspection and repair/maintenance of all internal Reservation fences
- ◆ Additional Reservation boundary fence reconstruction, repair, and maintenance
- ◆ Continue working with BLM and private land owner to address water gap trespass issues, implement appropriate projects
- ◆ Update range management plan and adopt necessary grazing ordinances
- ◆ Develop trespass livestock ordinance
- ◆ Develop Integrated Weed Management Plan for Vegetation Management
- ◆ Update Feral Horse Plan, Land Use Plan, and other Tribal management plans as necessary to comply with implemented or proposed BMPs, address NPS concerns, etc.
- ◆ Replace corroded or damaged livestock water troughs on the Reservation with tire troughs
- ◆ Assessment and restoration of geomorphology of Mahogany and Snow Creeks
- ◆ Backup water supply and delivery system for livestock water troughs
- ◆ Additional water sources for livestock water facilities
- ◆ Install additional fencing to allow for grazing in previously excluded areas.
- ◆ Replace wire gates with pipe gates or other turnstile type gates to discourage vehicular traffic and make it easier for people to close, resulting in fewer gates left open
- ◆ Install additional cattle guards where appropriate and maintain existing
- ◆ Install asphalt aprons on cattle guards to prevent erosion at edge of structure
- ◆ Reseed areas of bare soil along Mahogany and Snow Creeks and One Mile Spring
- ◆ Reseed areas of bare soil where other construction projects have taken place on the Reservation
- ◆ Improve Reservation roads: assess drainage needs, prescribe and implement improvements



**Figure 15.** Trespass cattle on the Summit Lake shoreline, summer 2010

- ◆ Map Summit Lake watershed, survey NPS source areas
- ◆ Obtain imaging and conduct other surveys to map lake level over time to monitor water quantity
- ◆ Monitor water quantity in Reservation water bodies
- ◆ Fuels reduction as NPS source prevention
- ◆ Fire break creation as NPS source prevention
- ◆ New signage along Reservation roads to prevent trespass and unnecessary vehicular travel
- ◆ Install desiccation monitors throughout watershed to monitor water quantity
- ◆ Develop a network of appropriate equipment to collect and analyze data for specific parameters that can be used for water quantity predictions and climate change modeling
- ◆ Streambank restoration and stability control
- ◆ Removal or upgrade of above ground fuel storage tanks in the Tribal Compound
- ◆ Remove rodents and rodent-proof existing Reservation structures
- ◆ Construct additional structures to prevent rodent access to vehicles and equipment
- ◆ Increase knowledge on climate change issues and improve collaborations with other entities monitoring climate change
- ◆ Continue eradication efforts for known invasive weed species and monitor for invasive aquatic flora and fauna species

## CHAPTER VI: REFERENCES

- Curry, B.B. and Melhorn, W.N. 1990. Summit Lake landslide and geomorphic history of Summit Lake basin, northwestern Nevada. *Geomorphology*, 4: 1-17.
- ITCN (Inter-tribal Council of Nevada). 1976. *Numa: A Northern Paiute history*. University of Utah Printing Service, Salt Lake City, Utah.
- Lumos and Associates, Inc. 2000. Summit lake paiute land use plan. Unpublished management plan. 59 pp.
- Novak-Echenique, P. and Youmans, R. 2013. Summit Lake Indian Reservation range management plan. Unpublished management plan. 234 pp.
- Summit Envirosolutions, Inc. 1998. Unified watershed assessment, Summit Lake Paiute Tribe, Summit Lake watershed Humboldt County, Nevada.
- SLPT (Summit Lake Paiute Tribe). 2010. Feral horse management plan for the Summit Lake Indian Reservation. Unpublished management plan. 60 pp.
- SLPT (Summit Lake Paiute Tribe). 2008. Water Quality Assessment Report for Clean Water Act Section 305(b) for Summit Lake Paiute Reservation. Unpublished report.
- Stewart, O. C. 1939. The Northern Paiute Bands, *Anthropological Records* 127(2:3):135-136.
- USDOI (U.S. Department of the Interior, Bureau of Indian Affairs, Western Regional Office). 2006. Summit Lake Paiute Vegetation Inventory- 2006. Phoenix, Arizona.
- USEPA (U.S. Environmental Protection Agency, Office of Water). 2010. Handbook for developing and managing tribal nonpoint source pollution programs under Section 319 of the Clean Water Act.
- USFWS (United States Fish and Wildlife Service). 1994. Lahontan cutthroat trout, *Oncorhynchus clarki henshawi*, recovery plan. Portland, OR. 147 pp.
- Vaile, D. 1986. Range Management Plan Outline. Bureau of Indian Affairs Western Nevada Agency. 16pp.

## **CHAPTER VII: APPENDICES**

### **List of Appendices**

**APPENDIX A: WATER QUALITY DATA**

**APPENDIX B: RANGE UNIT MAP**

**APPENDIX C: LAND USE MAP**

**APPENDIX D: LAND OWNERSHIP MAP**

**APPENDIX E: WASTE DISPOSAL ON MAHOGANY CREEK**

**APPENDIX F: TABLE TO CONNECT NPS SOURCES TO BMPS**

**APPENDIX G: TIMELINE FOR COOPERATION WITH BLM REGARDING WILD/FERAL HORSE  
MANAGEMENT**