



**SUSANVILLE INDIAN RANCHERIA**  
**UPDATED NONPOINT SOURCE POLLUTION**  
**ASSESSMENT REPORT**

**Susanville Indian Rancheria**  
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## TABLE OF CONTENTS

1.0	OVERVIEW	1
2.0	INTRODUCTION	3
3.0	METHODOLOGY	4
4.0	LAND USE SUMMARY	5
5.0	SURFACE AND GROUND WATER QUALITY	14
5.1	SURFACE WATER	14
5.2	GROUND WATER	16
6.0	RESULTS	18
7.0	DISCUSSION	24
8.0	SELECTION OF BEST MANAGEMENT PRACTICE	30
8.1	SUMMARY OF MANAGEMENT ACTIVITIES	31
9.0	NON POINT SOURCE CONTROL PROGRAMS	33
10.0	CONCLUSSIONS	38
	REFERENCES	36

## FIGURES

Figure 1	Location of Susanville Indian Rancheria Properties
Figure 2	Susanville Indian Rancheria -Upper Rancheria
Figure 3	The Lower Rancheria and Cemetery
Figure 4	SIR Herlong property in Lassen County
Figure 5	North Lahontan Hydrologic Region
Figure 6	East Barry Creek monitoring for contaminants
Figure 7	West Barry Creek
Figure 8	Susanville Indian Rancheria - Herlong
Figure 9	NRCS Soil Mapping Units
Figure 10	Susanville Indian Rancheria Noxious Weed Map

## **LIST OF TABLES**

Table 1	Location of Susanville Indian Rancheria Lands
Table 2	Location and Site ID of data collect points on SIR lands
Table 3	Land use and NPS Category on Upper Rancheria
Table 4	Soil types occurring on the Upper Rancheria
Table 5	Upper Rancheria CALVEG Classification Systems
Table 6	Land use Types and NPS Sub category
Table 7	Soil Types in Lower Rancheria ( USDA NRCS Soil Web Survey)
Table 8	Lower Rancheria CALVEG classification systems
Table 9	Land use and NPS Category
Table 10	Soil Types at SIR Herlong
Table 11	CALVEG Classification Systems
Table 12	Land Use and NPS Category
Table 13	Soil Types at Janesville
Table 14	CALVEG classification systems
Table 15	Soil Type at Ravendale
Table 16	Freshwater forested/shrub wetland classification code PSSC
Table 17	Wetland classification
Table 18	Impairment on Eagle – Honey Lake Basin
Table 19	Impaired water in East Branch North Fork Feather Basin
Table 20	Surface Water body impaired on Tribal Lands
Table 21	NPS Categories
Table 22	Core Participants for BMP's

## APPENDICES

Appendix A Soil Erosion Hazard Data

Appendix B Photos

### LIST OF ACRONYMS & ABBREVIATIONS

<b>ATV</b>	All-terrain Vehicle
<b>BLM</b>	Bureau of Land Management
<b>BMPs</b>	Best Management Practices
<b>BRAC</b>	Base Realignment & Closure Act
<b>CASQA</b>	California Storm water Quality Association
<b>CGP</b>	Construction General Permit
<b>CWA</b>	Clean Water Act
<b>EPA</b>	Environmental Protection Agency
<b>NRD</b>	Natural Resources Department
<b>HUC</b>	Hydrologic Unit Code
<b>JBR</b>	JBR Environmental Consultants, Inc.
<b>NOI</b>	Notice of Intent
<b>NPDES</b>	National Pollutant Discharge Elimination System
<b>NRCS</b>	National Resources Conservation Service
<b>SIAD</b>	Sierra Army Depot
<b>SIR</b>	Susanville Indian Rancheria
<b>SSURGO</b>	Soil Survey Geographic
<b>SWPPP</b>	Storm water Pollution Prevention Plan
<b>TCE</b>	Trichloroethylene
<b>TDS</b>	Total Dissolved Solids
<b>TMDLs</b>	Total Maximum Daily Loads
<b>USDA</b>	U.S. Department of Agriculture
<b>USGS</b>	U.S. Geological Survey
<b>USFS</b>	U.S. Forest Service
<b>WQS</b>	Water Quality Standards

# **SUSANVILLE INDIAN RANCHERIA NONPOINT SOURCE POLLUTION ASSESSMENT REPORT**

## **1.0 OVERVIEW**

The Susanville Indian Rancheria (SIR) is a federally recognized community of Native Americans located in northeastern California. SIR tribal lands total 1,688 acres located in four different areas of Lassen and Plumas counties (Figure 1). Surface water resources located on tribal lands include 1 perennial stream (Clarks Creek), 2 intermittent streams (East and West Berry Creeks), 5 documented springs, a wetland and a number of ephemeral drainages.

The SIR has received program eligibility status from EPA Region 9, through Sections 106 and 319 of the Clean Water Act (CWA) to develop a tribal water pollution management program. In 2006, as part of this program the SIR Natural Resources Department (NRD) completed a Nonpoint Source Assessment and Management Plan to help identify and address nonpoint sources of pollution, and to establish baseline water quality data. This report is an update to the previously approved Assessment and Management plan to include newly acquired properties and to incorporate data collected through the CWA 106 program.

Surface and groundwater quality data have been collected on SIR tribal land since the SIR's long-term water quality monitoring program began in 2007. This report presents an updated assessment of nonpoint source pollution on SIR tribal lands and provides management recommendations to address potential nonpoint pollution sources. This assessment is based on water quality data, Water Quality Assessment Reports submitted to the EPA, known problems or concerns identified by SIR Natural Resources Department (NRD) staff and visual observation of SIR tribal lands and water resources. The most likely sources of NPS pollution on SIR tribal lands include: Urban/residential runoff, construction activities, livestock use, unpaved road networks, invasive weeds, trespass activities, and all-terrain vehicles.

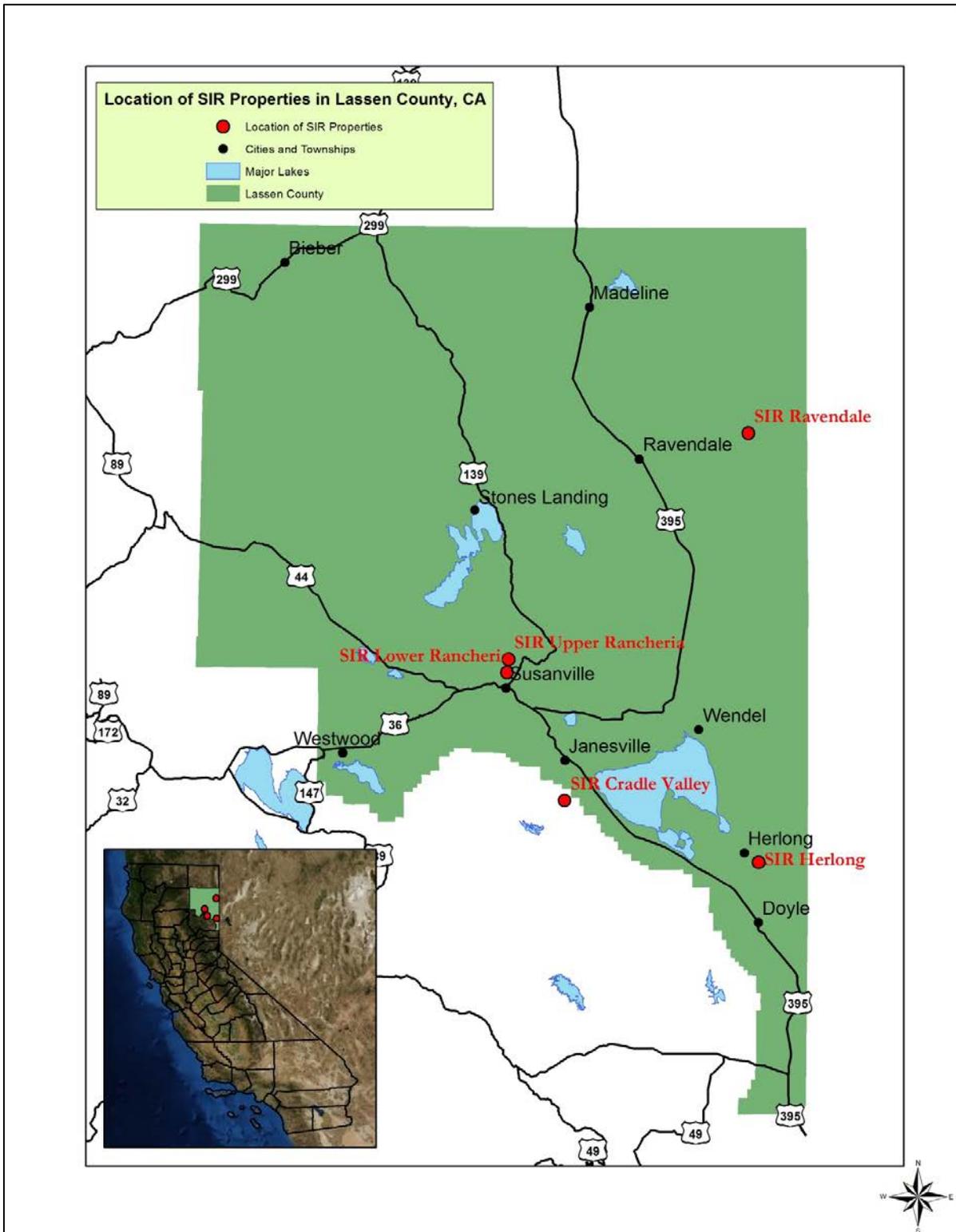


Figure 1: Location of Susanville Indian Rancheria properties

## 2.0 INTRODUCTION

The Susanville Indian Rancheria (SIR) is a federally recognized community of Native Americans located in northeastern California. Membership of the SIR consists of 1,136 tribal members from four tribes whose ancestral territories are present in the region (Northeastern Maidu, Northern Paiute, Pit River, and Washoe). The ancestors of the tribes and bands associated with the Susanville Indian Rancheria have lived in the northeastern California and northwestern Nevada region since time immemorial. These tribes and bands occupied a vast domain encompassing the Modoc Plateau to the north, Lake Tahoe to the south, Pyramid Lake to the east and Lassen National Park to the west. Control of virtually all of this land was lost with the arrival of settlers in search of gold and other resources in the 1800's.

In 1923, through the Landless and Homeless Indian Act, a 30 acre parcel was purchased for homeless Native Americans around the Susanville Area. In 1934, the Tribes elected to charter under authority of the Indian Reorganization Act (IRA) and the initial SIR Constitution and Bylaws were approved by the Secretary of the Interior on March 3, 1969; thus the four tribes became one political, governmental entity.

Presently, SIR tribal lands include six non-contiguous land bases in northeastern California totaling approximately 1,688 acres (1,401 in Trust; 287 acres in fee title). Lands are located in four areas of Lassen and Plumas Counties including Susanville, Janesville, Herlong, and Ravendale (Figure 1, Table 1). Approximately 220 of the 1688 acres have been developed with residences, community buildings, offices or commercial buildings.

**Table 1: Location of Susanville Indian Rancheria Lands**

<b>Location</b>	<b>Size (acres)</b>	<b>Land Status</b>
Susanville	1376	Fee (47 acres), Trust (1,329 acres)
Janesville	154	Fee
Herlong	72	Trust
Ravendale	80	Fee

SIR tribal trust lands contain various surface water resources including wetlands, springs, ephemeral drainages, intermittent streams, and groundwater. These water resources have the potential to be affected by urban/residential runoff, construction activities, livestock use, unpaved road networks, invasive weeds, trespass activities, and all-terrain vehicles. Groundwater resources on the Herlong property have potential water quality concerns due to contamination of a solvent spill at the nearby Sierra Army Depot and overdraft due to the expanding Reno/Sparks, NV area.

The Susanville Indian Rancheria Natural Resources Department (NRD) began the process of developing a Water Pollution Control Program (WPCP) in 2006. In 2007, using CWA106 funding, SIR NRD began collecting surface water quality data at 4 springs, 2 stream locations, and groundwater on the Herlong property. Constituents of concern sampled include sediment, temperature, dissolved oxygen, nutrients, petroleum hydrocarbons, and fecal coliform bacteria. The SIR is awaiting approval for the Janesville property to be accepted into trust, at which time

the NRD will begin water quality monitoring at 5 sites along Clarks Creek, which runs through the property.

The objectives of the SIR assessment and management program are: (1) Use the data collected since 2007 to assess the quality of water on tribal land; (2) Use the data collected to identify any problems associated with water quality; (3) Outline a range of options that can address current and foreseeable negative impacts; (4) To facilitate education and outreach programs and; (5) To continue current monitoring and reevaluation as necessary.

### **3.0 METHODS**

The Susanville Indian Rancheria has been monitoring water quality on tribal lands since the establishment of a CWA 106 program in 2007. The objective of this program is to collect baseline and long-term water quality information to support the development of water quality standards, monitor for nonpoint sources of pollution, and to inform management decisions. SIR data along with other sources of local long-term data is used to help meet program objectives, as well as for data comparison and trend tracking. The main source of supplement data comes from the California Department of Water Resources (DWR) and includes groundwater elevation monitoring dating back to 1957, groundwater quality dating back to 1971, and surface water parameters dating back to 2001. Other historical sources of data can be found in table 2.

To ensure the quality and usability of the data collected, the SIR developed and gained EPA approval for a Quality Assurance Project Plan (QAPP) in 2006, and an updated version in 2016. These plans cover the data collection methods for 12 surface water locations and 2 groundwater sources (table 2). Surface water data is collected quarterly at 7 sampling sites located on East and West Barry Creeks and biannually from 5 locations on Clarks Creek. Groundwater sampling is conducted biannually at the Herlong location and annually at the Janesville location (table 2).

Since no Tribal WQS currently exist for the SIR, California's LRWQCB standards, and USEPA's recommended national water quality criteria are used to evaluate the quality of the waters and serve as the Project Action Limits (PALs). Surface water parameters measured include: 6 anions (ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total phosphorus, orthophosphate), total suspended solids (TSS), total coliform, E. Coli, temperature, pH, dissolved oxygen (DO), specific conductivity, TDS, and turbidity. Herlong groundwater is sampled for Perchlorate and 72 Volatile Organic Compounds, pH, TSS, DO, specific conductivity, TDS and turbidity. Janesville groundwater is sampled for nitrate, nitrite, alkalinity, chloride, color, electrical conductivity, fluoride, hardness, pH, sulfate, total dissolved solids (TDS), total coliform, E.Coli and 12 metals (As, Ba, B, Ca, Cu, Fe, Pb, mg, k, Si, Na, Zn). Data is entered electronically into an excel spreadsheet and a hard copy is filed within the SIR NRD office. Additionally, data is submitted annually to the EPA STORET database.

**Table 2: Location and Site ID of data collect points on SIR lands**

	Location	Site ID	UTM Northing	UTM Easting
No.	Surface Water Monitoring Sites			
1.	Susanville, CA	SW-WBC-LR1	4478261.9	698769.6
2.	Susanville, CA	SW-WBC-LR2	4478129.9	698822.2
3.	Susanville, CA	SW-WBC-UR1	4478798.4	699156.6
4.	Susanville, CA	SW-WBC-UR2	4479062.4	698918.4
5.	Susanville, CA	SW-EBC-UR1	4479204.7	700289.9
6.	Susanville, CA	SW-EBC-UR2	4479950.9	700383.1
7.	Susanville, CA	SW-EBC-UR3	4479098.8	700121.4
8.	Janesville, CA	SW-UCC-CV1	4455998.2	712179.9
9.	Janesville, CA	SW-UWT-CV2	4455865.2	712447.5
10.	Janesville, CA	SW-LWT-CV3	4455763.9	712488.3
11.	Janesville, CA	SW-PND-CV4	4455644.5	712610.8
12.	Janesville, CA	SW-LCC-CV5	4455192.5	712922.2
	Ground Water Monitoring Wells			
13.	Janesville, CA	MW-CRV1	4455907.6	712586.0
14.	Herlong, CA	MW-HER1	4447194.5	744350.0

#### **4.0 LAND USE SUMMARY**

Susanville Indian Rancheria Tribal lands are comprised of lands in both fee and trust status, the Rancheria understands that EPA CWA 319 funds cannot be used on fee lands, but a description of land uses on all properties is included in this assessment to capture a complete picture SIR land uses.

##### **Susanville**

The properties in Susanville are divided into two non-contiguous areas, referred to as the Upper and Lower Rancheria (Figure 2 & 3).

##### **Upper Rancheria:**

The Upper Rancheria consists of 2 contiguous properties, both in trust status, one 995 acres and the other 300 acres for a total of 1295 acres. Current land uses on the Upper Rancheria consists

of 120 acre of urban development with 67 residential units, a church, maintenance facility, and 2 water storage tanks. The remaining 1175 acres are used for recreation, open space and wildlife habitat. Surrounding land uses include urban development of residential units, commercial businesses, wildlife habitat, timber production, livestock grazing and agriculture. Potential NPS categories and subcategories resulting from current land uses on tribal and surrounding lands are listed in table 3.

**Table 3: Land use and NPS Category on Upper Rancheria**

<b>Land Use</b>	<b>NPS Category</b>	<b>NPS subcategory</b>
Urban development	Urban Infrastructure	Residential
		Invasive Species
		Commercial Enterprises
		Paved Road Ways
		New Construction
Recreation	Recreation	On/Off Road vehicle use
		Invasive species
		Camping
Timber Production	Forestry	Unpaved roads
		Invasive Species
		Timber harvest
		Timber plantation
Agriculture	Agriculture	Crop production
		Invasive Species
		Rogue Cattle

Elevations on the Upper Rancheria range from 4,400 – 5,120 ft with slopes of generally less than 10% on the southern portion and up to 30-40% in the northern portion. The USDA NRCS Web Soil Survey delineates 11 soil types occurring on the Upper Rancheria (Table 4). All soil types found on the upper Rancheria are characterized as well drained, however, erosion potential for road, trail and off-road, off-trail ranges from slight to severe. Vegetation types supported by these soils, as defined by the CALVEG classification systems, are overwhelmingly shrub dominated with lesser amounts of eastside pine, juniper, annual grass and meadow (Table 5). CALVEG source data for this area was collected in 1999, since that time SIR staff has observed an increase in the density and canopy cover of juniper, annual grasses and invasive weeds.

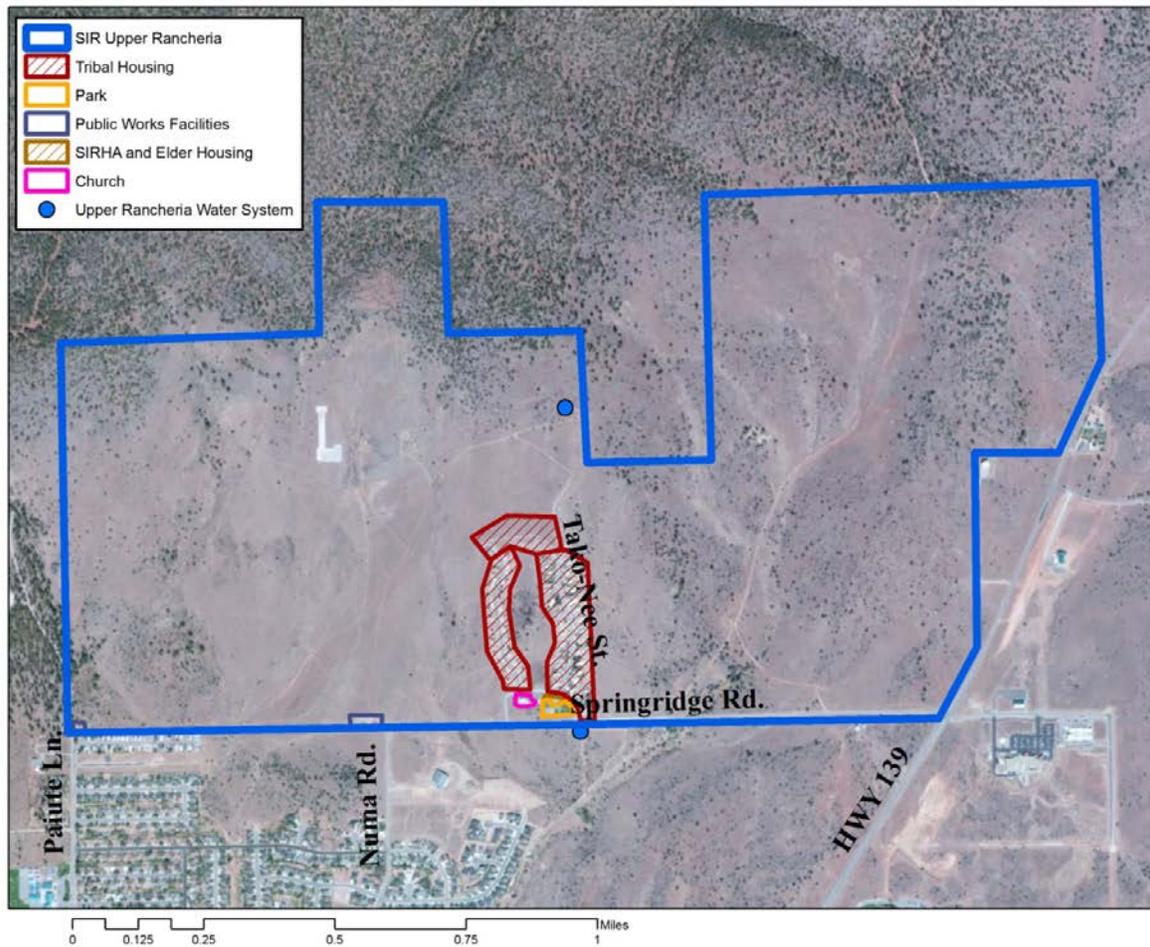
**Table 4: Soil types occurring on the Upper Rancheria**

Map Unit Symbol	Name	Slope	Drainage Class	Erosion Hazard
116	Bieber cobbly loam	2 to 9	Well drained	Road, Trail: Moderate Off-Road, Off-trail: slight
179	Devada-Rock outcrop association	2 to 50	Well drained	Road, Trail: Severe Off-Road, Off-trail: Moderate
194	Fiddler-Gavel-Rubble land complex	5 to 30	Well drained	Road, Trail: Severe Off-Road, Off-trail: Moderate
195	Fiddler-Gavel-Rubble land association	30 to 50	Well drained	Road, Trail: Severe Off-Road, Off-trail: Severe
220	Gerlach silty clay	2 to 9	Well drained	Road, Trail: Moderate Off-Road, Off-trail: slight
221	Gerlach cobbly silty clay	2 to 9	Well drained	Road, Trail: Moderate Off-Road, Off-trail: slight
360	Searles-Orhood-Devada association	5 to 30	Well drained	Road, Trail: Severe Off-Road, Off-trail: Moderate
364	Southpac very stony loam	30 to 50	Well drained	Road, Trail: Severe Off-Road, Off-trail: severe
365	Springmeyer sandy loam	0 to 5	Well drained	Road, Trail: Moderate Off-Road, Off-trail: slight
390	Tunnison-Devada association	2 to 9	Well drained	Road, Trail: Moderate Off-Road, Off-trail: slight
394	Ulhalf-Southpac complex	2 to 30	Well drained	Road, Trail: Moderate Off-Road, Off-trail: slight

**Table 5: Upper Rancheria CALVEG Classification Systems**

CWHR: California Wildlife Habitat Relationship				Acres
CWHR Code	Habitat Type	Tree Size	Canopy Closure	
AGSXX	AGS-annual grass land	Not Determined	Not Determined	
WTMXX	WTM-wet meadow	Not Determined	Not Determined	
SGBXX	SGB-sage brush	Not Determined	Not Determined	
MRI2D	MRI-montane riparian	2-sapling: dbh 1-6"	D- 60-100%	
EPN3P	EPN-Eastside Pine	3-pole: dbh 6-11"	P- 25-39%	
EPN2P	EPN-Eastside Pine	2-sapling: dbh 1-6"	P- 25-39%	
EPN4M	EPN-Eastside Pine	4-small tree: dbh 11-24"	M- 40-59%	
EPN3S	EPN-Eastside Pine	3-pole: dbh 6-11"	S-10-24%	
JUN3S	JUN-Juniper	3-pole: dbh 6-11"	S-10-24%	

**Figure 2: Susanville Indian Rancheria - The Upper Rancheria**



**Lower Rancheria:**

The Lower Rancheria consists of 8 parcels totaling 84 acres. The parcels are a combination of fee and trust lands with 2 parcels in trust status (37 acres) and 6 parcels in fee status (47 acres) (Figure 3). Land uses on the Lower Rancheria consist of 37 acres of urban development with 38 houses and 6 low-rent units in the Elder Springs Development, tribal government facilities and offices, a cemetery, and several commercial enterprises including the Diamond Mountain Casino and Hotel, Diamond Mountain Mini Mart/gas station, and Diamond Mountain Coffee and Smoke Shop. The remaining 47 acres was most recently used as a small ranch with 1 residence and several out building which have been demolished and all debris removed. Surrounding land use consists primarily of urban development of residential units, commercial enterprises, recreation trails and open space. Potential NPS categories and subcategories resulting from current land uses on tribal and surrounding lands are listed in table 6.

**Table 6: Land use Types and NPS Sub category**

Land Use	NPS Category	NPS subcategory
Urban development	Urban Infrastructure	Residential
		Invasive Species
		Commercial Enterprises
		Paved Road Ways
		New Construction
Recreation	Recreation	On/Off Road vehicle use
		Invasive species

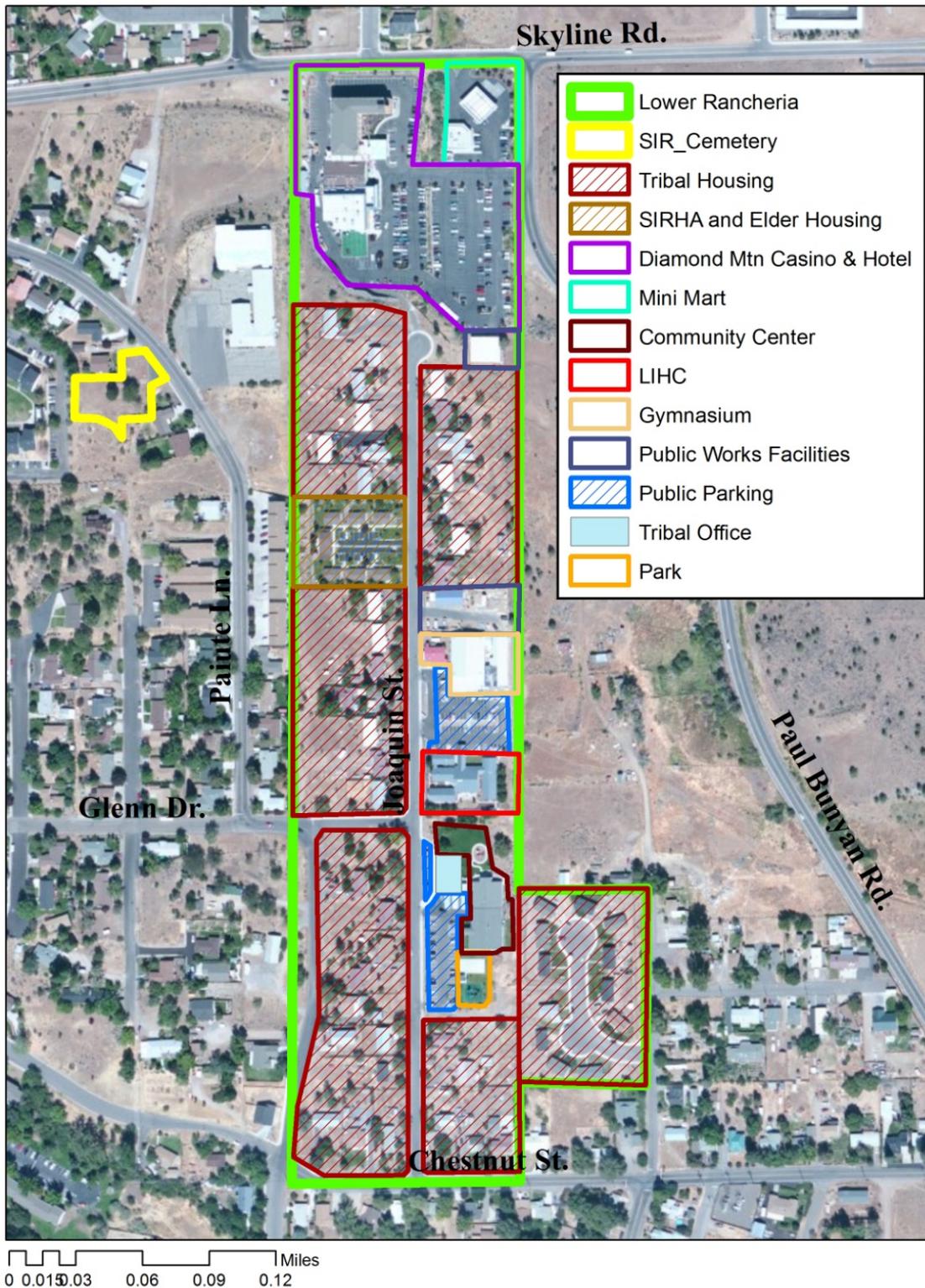
Elevations on the Lower Rancheria range from 4280-4320 ft. with slopes of generally less than 10%. The USDA NRCS Soil Web Survey delineates 6 soil types occurring in the area (Table 7). All soil types found on the Lower Rancheria are classified as well drained, however, road, trail and off-road off-trail erosion hazards range from slight to severe. Vegetation types supported by these soils, as defined by the CALVEG classification systems, are predominately sage brush with smaller amounts of montane riparian and urban classifications (Table 8).

**Table 7: Soil Types in Lower Rancheria ( USDA NRCS Soil Web Survey)**

Map Unit Symbol	Name	Slope	Drainage Class	Erosion Hazard
110	Badenaugh stony sandy loam	5 to 15	Well drained	Road, Trail: Moderate Off-Road, Off-trail: Slight
116	Bieber cobbly loam	2 to 9	Well drained	Road, Trail: Moderate Off-Road, Off-trail: slight
179	Devada-Rock outcrop association	2 to 50	Well drained	Road, Trail: Severe Off-Road, Off-trail: Moderate
357	Searles-Devada-Rubble land association	30 to 50	Well drained	Road, Trail: Severe Off-Road, Off-trail: Severe
360	Searles-Orhood-Devada association	5 to 30	Well drained	Road, Trail: Severe Off-Road, Off-trail: Moderate
365	Springmeyer sandy loam	0 to 5	Well drained	Road, Trail: Moderate Off-Road, Off-trail: slight

**Table 8: Lower Rancheria CALVEG classification systems**

CWHR: California Wildlife Habitat Relationship				Acres
CWHR Code	Habitat Type	Tree Size	Canopy Closure	
URBXX	URB-urban	Not Determined	Not Determined	1.8
SGBXX	SGB-sage brush	Not Determined	Not Determined	77.9
MRI2	MRI-montane riparian	2-sapling: dbh 1-6"	M- 40-59%	2.3



**Figure 3: The Lower Rancheria and Cemetery**

## Herlong

The Herlong property consists of two parcels in trust status totaling 72 acres (Figure 4). Land uses on the SIR property in Herlong include urban development with 120 residential units, a commercial building, and open space. Nearby land uses include urban development, an army base, other industrial activities, agriculture, recreation and open space. Potential NPS categories and subcategories resulting from current land uses on tribal and surrounding lands are listed in table 9.

**Table 9: Land use and NPS Category**

Land Use	NPS Category	NPS subcategory
Urban development	Urban Infrastructure	Residential
		Invasive Species
		Commercial Enterprises
		Paved Road Ways
		New Construction
Recreation	Recreation	On/Off Road vehicle use
		Invasive species
		Camping
Agriculture	Agriculture	Crop production
		Invasive Species
		Rogue Cattle

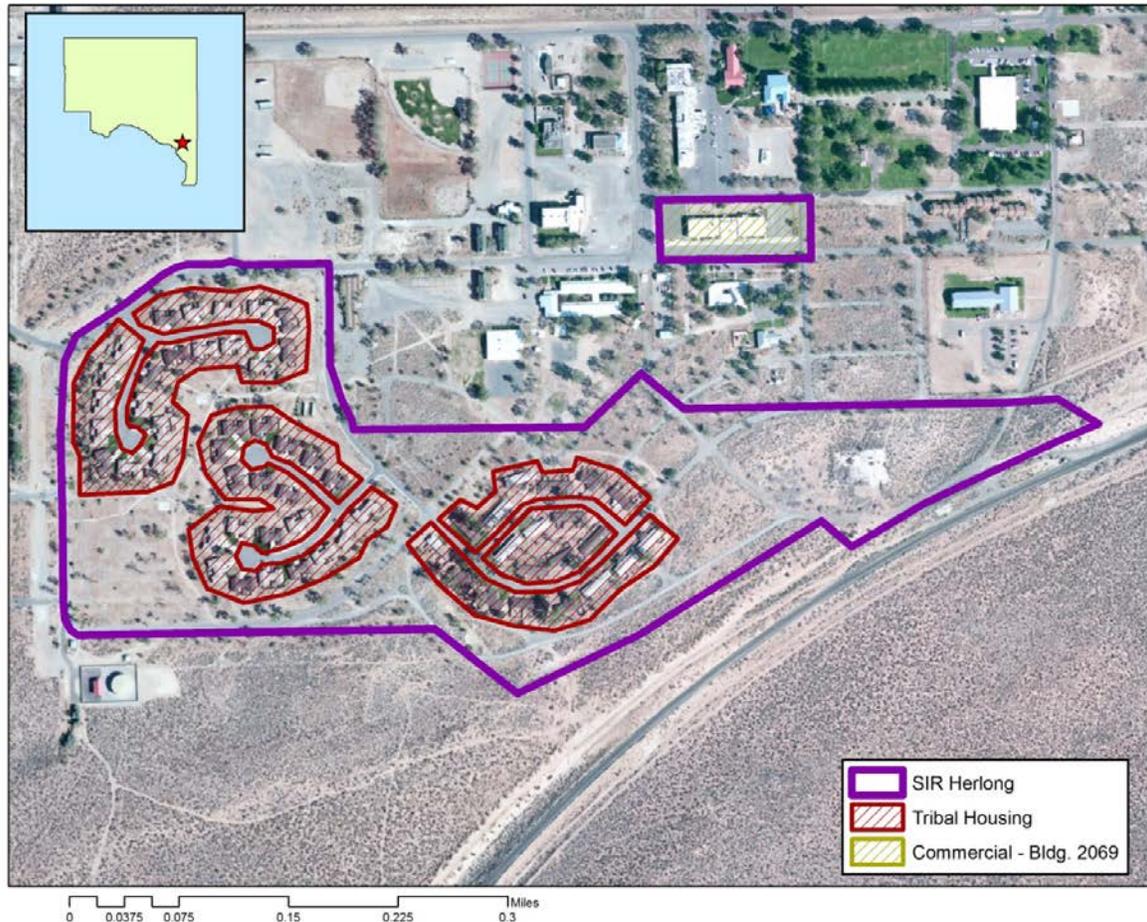
Elevation at the Herlong property is 4150 ft with slopes of less than 10%. The USDA NRCS Soil Survey delineated 3 soil types occurring on the project area (Table 10). All soil types are classified as excessively drained, however, road/trail and off-road/off-trail erosion hazard rating range from slight to moderate. Vegetation types supported by these soils, as defined by the CALVEG classification systems, are predominately sage brush with a smaller amount of wet meadow (Table 11). SIR staff believes that the wet meadow classification maybe an error and should be classified as urban.

**Table 10: Soil Types at SIR Herlong**

Map Unit Symbol	Name	Slope	Drainage Class	Erosion Hazard
251	Incy fine sand	0 to 5	Excessively drained	Road, Trail: Slight Off-Road, Off-trail: Slight
289	Mottsville gravelly loamy coarse sand	2 to 9	Excessively drained	Road, Trail: Moderate Off-Road, Off-trail: Slight
408	Zorravista sand	2 to 15	Excessively drained	Road, Trail: Moderate Off-Road, Off-trail: Slight

**Table 11: CALVEG Classification Systems for Herlong**

CWHR: California Wildlife Habitat Relationship				Acres
CWHR Code	Habitat Type	Tree Size	Canopy Closure	
SGBXX	SGB-sage brush	Not Determined	Not Determined	
WTMXX	WTM-wet meadow	Not Determined	Not Determined	



**Figure 4: SIR Herlong property in Lassen County showing residential housing areas, open space and the commercial building**

### Janesville

The Janesville Property is a total of 154 acres of fee land which is expected to move into trust status in the very near future. Land uses on the Janesville property include recreational developments of a cabin, restrooms and a water tank, other tribal land uses include open space/wildlife habitat, and traditional uses. Additionally, there is a 66 acre Natural Resource Conservation Service (NRCS) Wetland Reserve Program (WRP) conservation easement that encompasses Clarks Creek and associated meadow. Land uses on the surrounds properties

include timber production, recreation, agriculture and open space/wildlife. Potential NPS categories and subcategories resulting from current land uses on tribal and surrounding lands are listed in table 12.

**Table 12: Land Use and NPS Category**

Land Use	NPS Category	NPS subcategory
Recreation	Recreation	On/Off Road vehicle use
		Invasive species
		Camping
Timber Production	Forestry	Unpaved roads
		Invasive Species
		Timber harvest
		Timber plantation
Agriculture	Agriculture	Invasive Species
		Rogue Cattle

Elevations ranging from 5,920 to 6,120 ft. Slopes range from less than 10% close to the meadow and up to 25% on upland slopes. The USDA NRCS Soil Web Survey delineates 2 soil types on the Janesville property (Table 13). These soils are classified as somewhat excessively drained, and erosion hazard ratings range from moderate to severe. Vegetation types supported by these soils, as defined by the CALVEG classification systems, are predominately eastside pine with a smaller amount of sage brush, annual grass and aspen (Table 14). Based on SIR staff observation, the areas designated as annual grass is actually wet meadow.

**Table 13: Soil Type at Ravendale**

Map Unit Symbol	Name	Slope	Drainage Class	Erosion Hazard
107	Bucking family-Haplaquolls complex	2 to 30	Somewhat excessively drained	Road, Trail: Moderate Off-Road, Off-trail: Moderate
109	Cagwin-Toem families complex	2 to 70	Somewhat excessively drained	Road, Trail: Severe Off-Road, Off-trail: Severe

**Table 14: CALVEG classification systems**

CWHR: California Wildlife Habitat Relationship				Acres
CWHR Code	Habitat Type	Tree Size	Canopy Closure	
AGSXX	AGS-annual grass land	Not Determined	Not Determined	12.6
ASP2D	ASP-aspen	2-sapling: dbh 1-6"	D- 60-100%	.04
EPN4D	EPN-Eastside Pine	4-small tree: dbh 11-24"	D- 60-100%	33.9
SGBXX	SGB-sage brush	Not Determined	Not Determined	4
EPN4M	EPN-Eastside Pine	4-small tree: dbh 11-24"	M- 40-59%	74.4
EPN4P	EPN-Eastside Pine	4-small tree: dbh 11-24"	P- 25-39%	29.3

## Ravendale

The Ravendale property is 80 acres of fee land with elevations ranging from 5480 to 5880 ft with an average slope of 30 -50 % near the stream and 10% elsewhere. The USDA NRCS Soil Survey delineated 3 soil types occurring on the project area (Table 15). Vegetation types supported by these soils include sagebrush steppe and juniper woodland with a small patch of aspen near the creek

Primary land use for the site is wildlife habitat. Surrounding land use includes wildlife/open space, agriculture and recreation.

**Table 15: Soil Type at Ravendale**

<b>Map Unit Symbol</b>	<b>Name</b>	<b>Slope</b>	<b>Drainage Class</b>	<b>Runoff Potential</b>
103	Anawalt-Ninemile association	5 to 15	Well drained	High
240	Home Camp-Runyon association	5 to 30	Well drained	Moderate High
301	Observation-Searles-Madeline association	30 to 50	Well drained	High

Soil types occurring on SIR tribal lands were evaluated to identify any highly erodible soils that may occur in the assessment area. Soil information was obtained from the Soil Survey Geographic (SSURGO) database for Susanville Area, Parts of Lassen and Plumas Counties, California (USDA 2015). A summary of erosion hazard for the various soil types is presented in Appendix A. Land use information was obtained from SIR tribal members and employees, maps developed by SIR NRD and from the SIR Master Plan (SIR 2004). Ecological information was obtained from the CalVeg 1999 survey.

## **5.0 SURFACE AND GROUNDWATER QUALITY SUMMARY**

### **5.1 SURFACE WATER**

As defined by the U.S. Fish and Wildlife Service National Wetland Inventory the lower Rancheria contains 3 wetlands. 1 acre freshwater emergent wetland classification code PEM1C, 0.15 acre freshwater emergent wetland classification code PEM1C, 0.32 acre freshwater forested/shrub wetland classification code PSSC (Table 16).

**Table 16: freshwater forested/shrub wetland classification code PSSC**

	<b>System</b>	<b>Class</b>	<b>Subclass</b>	<b>Water Regime</b>	<b>Acres</b>
PEM1C	P-Palustrine	EM-emergent	1-Persistent	C-Seasonally Flooded	1.2
PSSC	P-Palustrine	SS-Scrub-Shrub	NA	C-Seasonally Flooded	0.3

As identified by U.S. Fish and Wildlife Service National Wetland Inventory the Janesville Property contains a total of 20.3 acres of freshwater emergent and freshwater forested/shrub wetland in 4 different wetland classifications. A breakdown of acreage by wetland classification type can be found in Table 17.

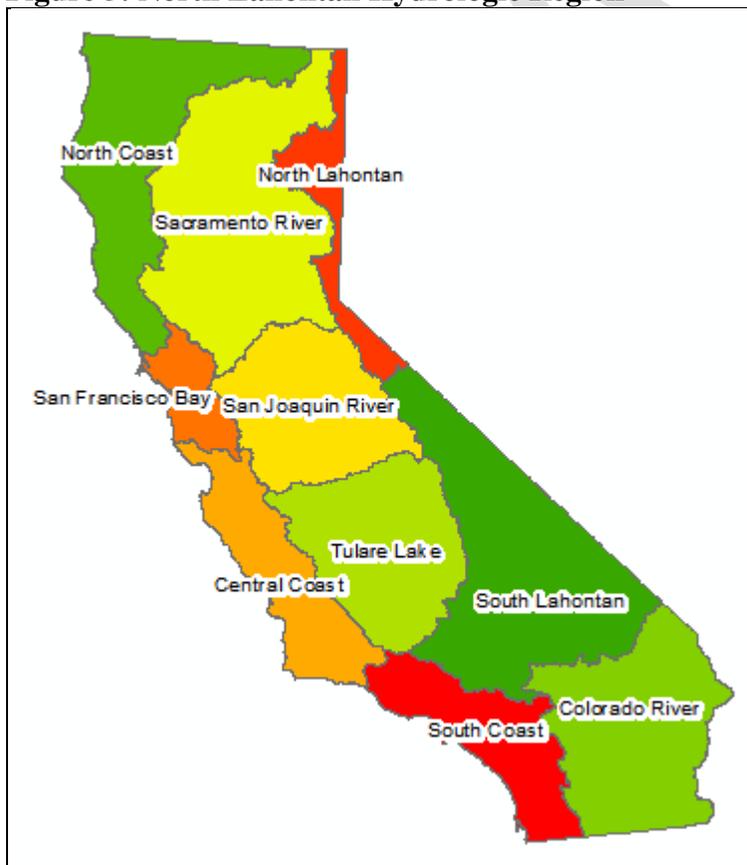
**Table 17: Wetland classification**

	System	Class	Subclass	Water Regime	Modifier	Acres
PSSC	P-Palustrine	SS-Scrub-Shrub	NA	C-Seasonally Flooded	NA	2.7
PSSA	P-Palustrine	SS-Scrub-Shrub	NA	A-Temporary Flooded	NA	0.6
PEM1Ch	P-Palustrine	EM-emergent	1-Persistent	C-Seasonally Flooded	h-diked/impounded	1
PEM1C	P-Palustrine	EM-emergent	1-Persistent	C-Seasonally Flooded	NA	16

**Susanville**

Water bodies located on tribal property in the Susanville area are located within the Eagle-Honey Lake Watershed and Lassen Creek-Susan River (HUC 180800030703) sub watershed which are within the North Lahontan Hydrologic Region (Figure 6). The Eagle-Honey Lake Watershed is 189.07 km<sup>2</sup> and the Lassen Creek-Susan River watershed comprises 110 km<sup>2</sup> of that area.

**Figure 5: North Lahontan Hydrologic Region**



Water bodies located on SIR lands in the Susanville area include 2 intermittent streams, East and West Barry Creeks. The head waters of these streams are located on the Upper Rancheria and consist of several ephemeral drainages and springs. The creeks flow from the Upper Rancheria south through parts of Susanville and back on tribal lands on the Lower Rancheria. A total 2.2 miles of East Barry Creek runs through tribal lands and 1.4 miles of West Barry Creek. The springs, creeks and associated vegetation are heavily utilized by wildlife as they provide a rare source of water and nutrients in the area. Additionally, some of the vegetation associated with these water bodies has important cultural value and is gathered for traditional uses.

In 2012, a survey was conducted on 4 of the springs located on the Upper Rancheria. Results of the survey indicate that the only 1 spring flows throughout the year and with sufficient volume (1 gal/min) to flow approximately 650 ft (Shasta Environmental). The 3 remaining springs flow intermittently throughout the year, but enough water is present to support wetland obligate vegetative species. The study also estimated the recharge area for springs 1, 2 and 3 to be approximately 480 acres (figure X) and estimated the potential recharge from the area to be 66 acre-feet per year assuming a 50% runoff rate and 33 acre-feet of recharge assuming a 75% runoff rate (Lawrence & Associates, 2012).

### **Herlong**

There are no surface waters on or immediately adjacent to SIR lands in Herlong.

### **Janesville**

The Janesville site is located in the Feather River Watershed, which drains the western flank of the Sierra Nevada and is part of the Sacramento River Hydrologic Region. The property is located in the 47 km<sup>2</sup> Cradle Valley sub watershed (HUC 180201220203). Surface waters at the site include 0.98 miles of the intermittent? Perennial? Clarks Creek, 1.6 miles of ephemeral drainages and 66 acres of associated meadow. The uses of the stream are primarily for wildlife and gathering of traditional use plants in the associated meadow.

### **Ravendale**

The Ravendale property is located in the 93 km<sup>2</sup> Buckhorn Reservoir sub watershed (HUC 180800020104). A 450 ft section of Buckhorn creek runs through the property. The primary use of Buckhorn creek on is a source of water for wildlife and cattle.

## **5.2 GROUNDWATER**

### **Susanville**

SIR lands in the Susanville area are within an upland area that does not fall within a groundwater basin as defined by the California Department of Water Resources. One well exists on tribal lands in the Susanville. The well exists on a newly acquired property so not many construction details are known. SIR receives its domestic water supply from the City of Susanville Public Works Department. This drinking water is supplied from two springs (Bagwell and Cady) and three wells (wells #1, #3, and #4). Drinking Water Source Assessments prepared for these water

sources are available online from the California Department of Health Services Division of Drinking Water and Environmental Management website (DHS 2006)

## **Herlong**

SIR lands in Herlong are within groundwater basin No. 6-4: The Honey Lake Valley. Groundwater in the Honey Lake Valley is mainly recharged by precipitation (40 percent) and infiltration of stream flow on the alluvial fans and river channels near the range front (38 percent), with lesser contributions by irrigation return (18 percent) and subsurface inflow (4 percent) (Handman et al. 1990). Groundwater Carbon-14 data suggest that recharge rates for the entire basin are between 45,000 and 60,000 acre-feet per year (Rose et al. 1997).

Depth to groundwater in Herlong is variable depending on location and season. Water supply wells for the SIAD, located within the vicinity of SIR properties, average about 700 feet deep and have an average static depth to groundwater of 105 to 121 feet below ground surface (Winzler and Kelly 2005). These wells currently serve the entire Herlong community including SIR properties.

Water quality in the deep wells supplying Herlong suffers from hardness and high concentration of manganese, iron, and sulfates (US Army 1979). Many wells in the Honey Lake Valley contain hazardous concentrations of total dissolved solids, boron, fluoride, and nitrate (DWR 1975). Total Dissolved Solids (TDS) in SIAD wells has been increasing and does not currently meet EPA secondary drinking water standards (SIR 2003). The evidence of groundwater degradation over time may be the result of groundwater draw down from extraction (US Army Corp of Engineers 1998).

Activities at SIAD have resulted in several contaminated TCE plumes in the groundwater below the depot. Evidence indicates that as water is pumped from the wells, water from the contaminated plume could migrate closer to the wells (US Army Corp of Engineers 1999). Winzler and Kelly (2005) performed a Phase II Environmental Site Assessment at the SIR Herlong property, drilled two wells for sampling groundwater, and completed one monitoring well at the property. The monitoring well is screened between 190 and 200 feet below ground surface in a sand horizon. Groundwater is analyzed for the presence of perchlorate and volatile organic compounds (VOCs). Analytical results from the sampling performed in April 2005 by Winzler and Kelly and from 2007 through 2016 by the SIR have not detected perchlorate or VOCs in groundwater samples.

## **Janesville**

The SIR is currently investigating groundwater conditions at the Cradle Valley site. A well, water storage tank, and septic system were installed on the Cradle Valley by D-T Pumps based out of Susanville in 2007. The well flow is approximately 15gpm with a peak of 23gpm. The storage tank is a galvanized 5,000 gallon tank measuring 8'x5'x13'. Little to no groundwater quality data exists for the site at this time. The SIR NRD and Public Works Department are in the process of developing a site sampling plan for the property due to increased use by tribal members.

## 6.0 RESULTS

This nonpoint source assessment is based on problems or concerns identified by SIR NRD and visual observation of SIR tribal lands and water resources by SIR NRD. Water quality issues identified through water quality data collected from 2007 through 2016 under the SIR's long-term monitoring program and potential sources of nonpoint source pollution are discussed below. Information and data contained in this report regarding specific water quality parameters and pollutants causing impairment will be updated as water quality data continues to be collected on SIR tribal land. The status of known and potential impairments to surface water bodies on or adjacent to Reservation Trust lands is summarized in table 18.

### Eagle-Honey Lake Basin

According to the 2012 EPA Water Quality Assessment Report, the Eagle-Honey Lake Basin contains 6 impaired water bodies. These water bodies are impaired by elevated concentrations of TDS, total Nitrogen, Mercury, Turbidity and unknown toxicity. Table 18 summarizes the impairments by water body within the watershed. The water bodies (East and West Barry Creek) located on tribal property were not analyzed as part of the 2012 EPA Water Quality Assessment Report. However, the SIR has been monitoring 6 locations within the Eagle-Honey Lake basin since 2007. Parameters monitored include; Dissolved Oxygen, turbidity, temperature, pH, Ammonia, Nitrite, Nitrate, Kj Nitrogen, Total Nitrogen, E. coli, Total coliform, gas, motor oil, diesel. Results of this monitoring in discussed below.

**Table 18: Impairments of the water bodies in Eagle-Honey Lake Basin**

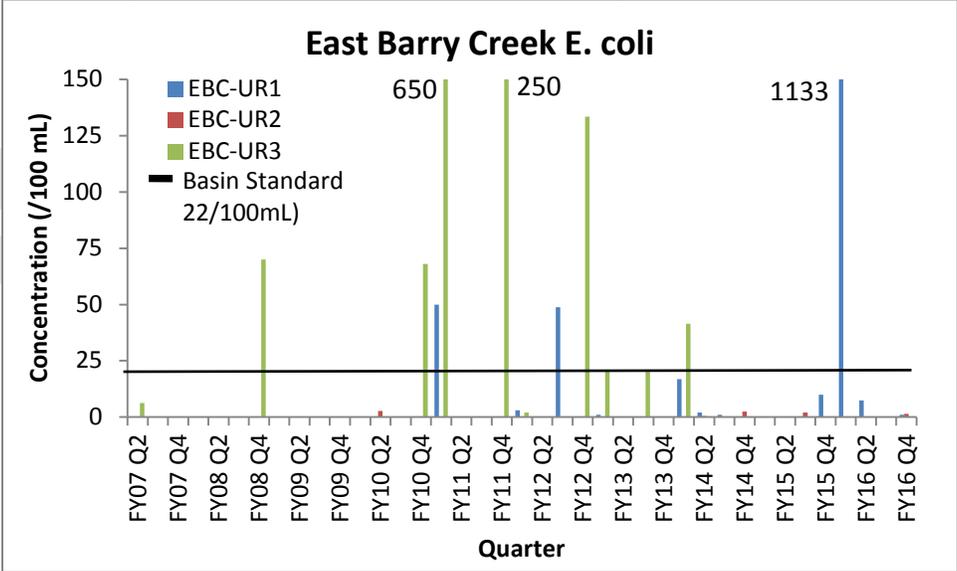
Water Body	Designated Use	Status	Cause of impairment	Source
Susan River (headwaters to Susanville)	Cold Freshwater Habitat	Impaired	TDS, total Nitrogen, unknown toxicity	Unknown
	Commercial and Sport Fishing	Impaired	Mercury	Unknown
Susan River (Susanville To Litchfield)	Cold Freshwater Habitat	Impaired	Mercury, TDS, turbidity, unknown toxicity	Unknown
	Commercial and Sport Fishing	Impaired	Mercury	Unknown
	Municipal and Domestic Supply	Impaired	TDS, turbidity	Unknown
Susan River (Litchfield to Honey Lake)	Cold Freshwater Habitat	Impaired	Unknown toxicity	Unknown
	Commercial and Sport Fishing	Impaired	Mercury	Unknown
Eagle Lake	Cold Freshwater Habitat	Impaired	Nitrogen, Phosphorus	Unknown
Honey Lake	Agricultural Supply	Impaired	Salinity/Total Dissolved Solids/Chlorides	Unknown
	Water Contact	Impaired	Arsenic	Impacts From Flow

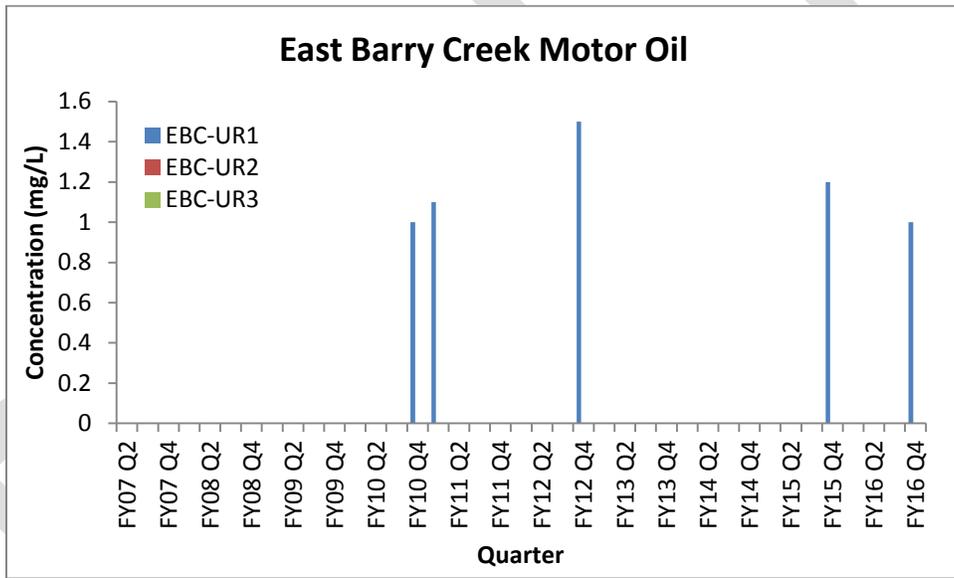
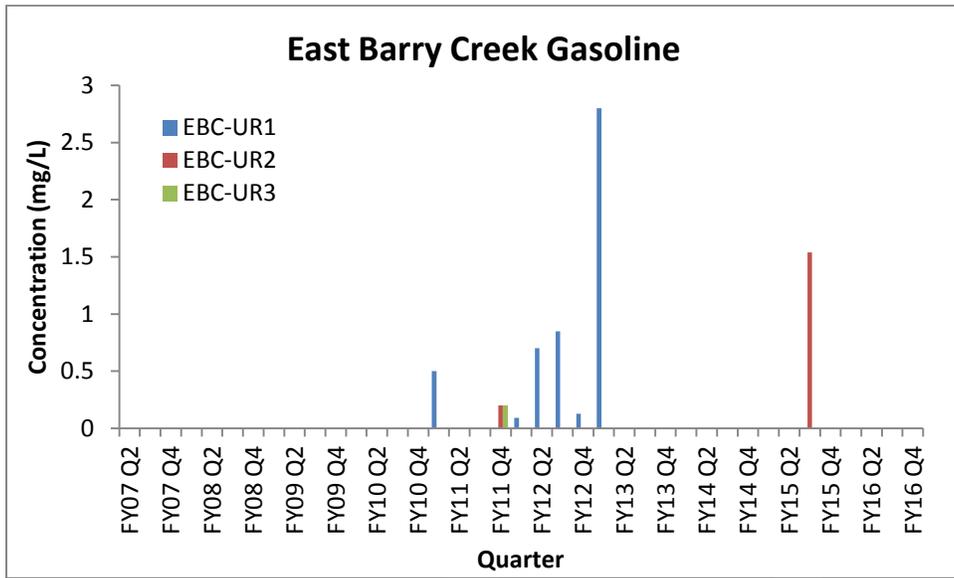
	Recreation			Alteration/Regulation/Modification, Impacts From Geothermal Development, Natural Sources, Non-Point Source
Honey Lake Wildfowl Management Ponds	Cold Freshwater Habitat	Impaired	Metals	Unknown
	Warm Freshwater Habitat	Impaired	Salinity/Total Dissolved Solids/Chlorides, trace elements	Unknown

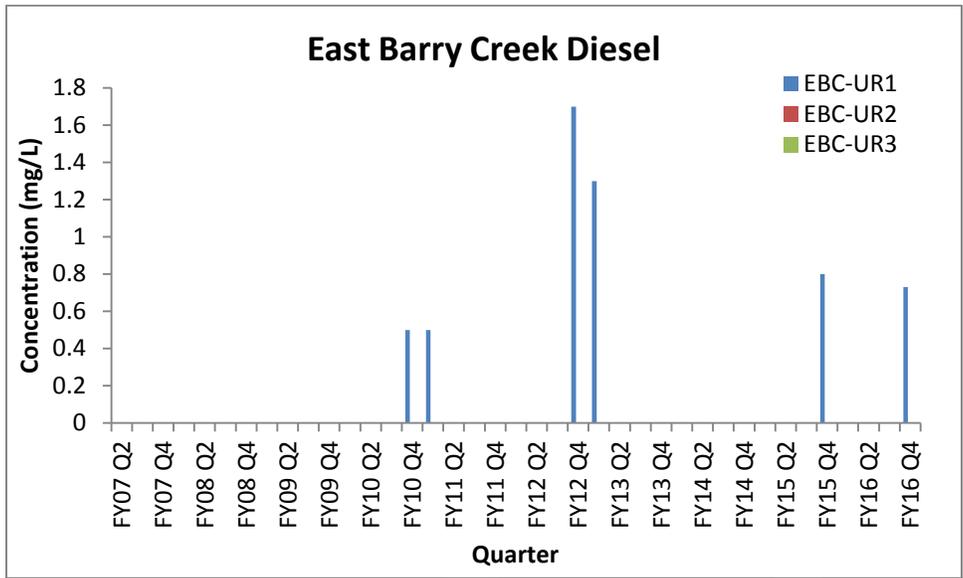
**East Barry Creek**

2.25 miles of intermittent drainages to East Barry Creek are located on Tribal trust lands and an additional 0.17 miles of the stream is located on tribal fee lands. The SIR has been monitoring 3 locations on the eastern drainage of East Barry Creek quarterly since 2007 (Figure 6). The overall condition of East Barry Creek on tribal land is fair, with a few parameters of concern. The concerns include elevated levels of E. coli, and the presence of gasoline, motor oil and diesel. Since 2007 a total of 68 samples have been collected along East Barry Creek. Of those 68 samples, 26 have contained E. coli and 9 samples have been above the basin standard of 22/100 mL. Additionally, gasoline has been detected in 9 samples, motor oil in 5 samples and diesel in 6 samples.

**Figure 6: East Barry Creek monitoring for contaminants**



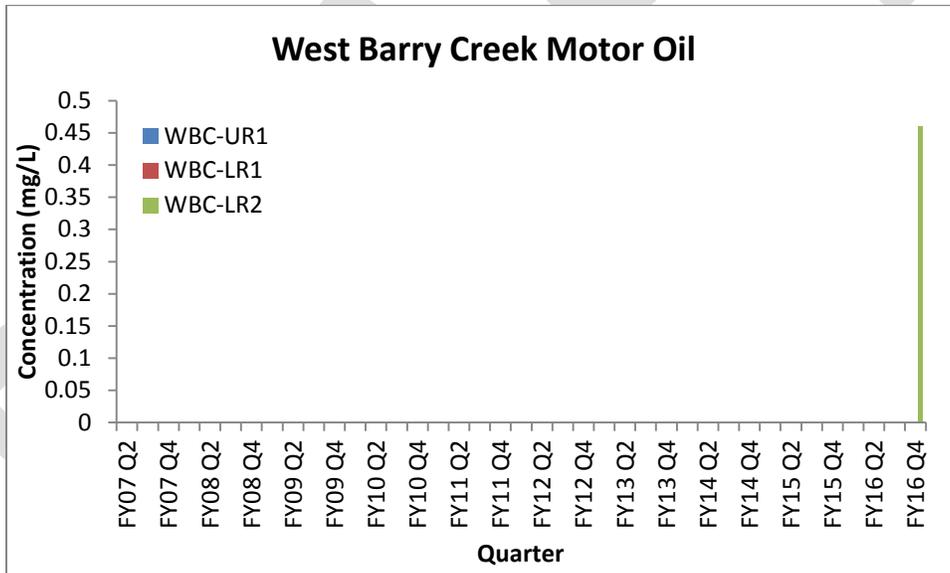
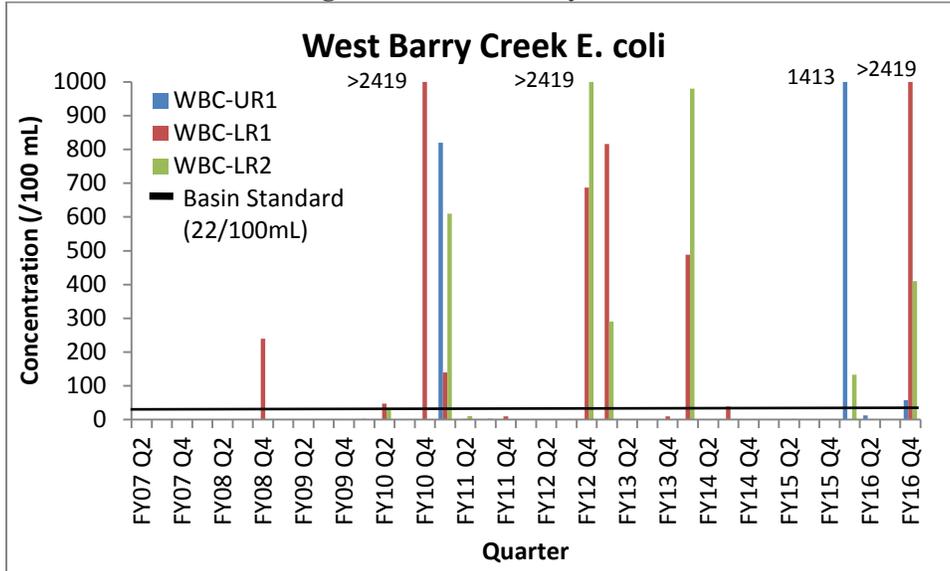


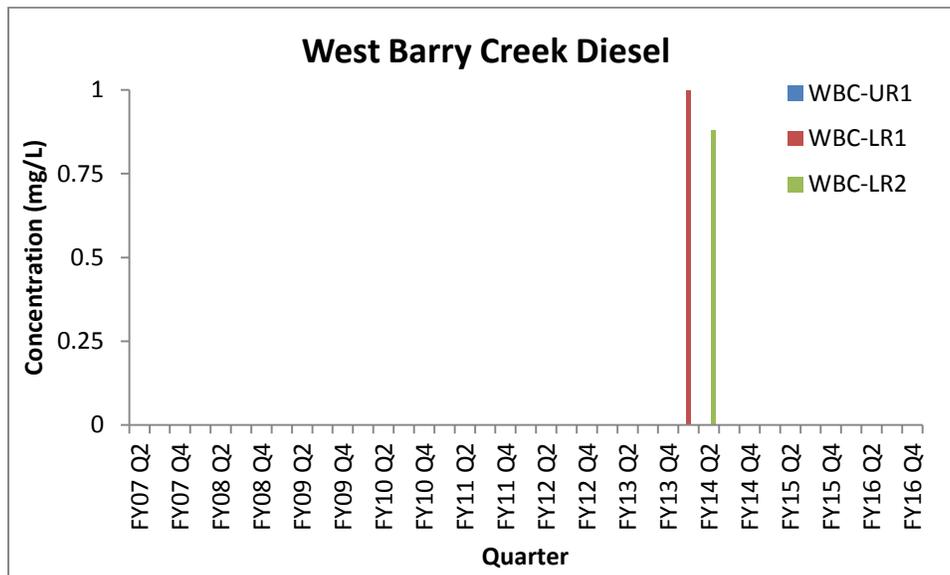


### West Barry Creek

95 miles of the intermittent West Barry Creek runs through tribal trust property and an additional .5 miles runs through fee property (Figure 7). The SIR has been monitoring 3 locations quarterly since 2007. Monitoring locations are a spring at the head waters of the stream and 2 locations downstream where the stream enters tribal property at the Diamond Mountain Casino, Hotel and Mini Mart Parking lot, and the 3rd as the stream leaves the parking lot. The overall condition of East Barry Creek on tribal land is fair, with a few parameters of concern. The concerns include elevated levels of E. coli, and the presence of motor oil and diesel. Since 2007, a total of 47 samples have been collected along East Barry Creek. Of those 47 samples, 23 have contained E. coli and 19 samples have been above the basin standard of 22/100 mL. Additionally, 1 sample contained motor oil and 2 samples contained diesel.

**Figure 7: West Barry Creek**





### East Branch North Fork Feather Basin HUC 18020122

According to the 2012 EPA Water Quality Assessment Report, the East Branch North Fork Feather Basin contains 2 impaired water bodies. These water bodies are impaired by elevated concentrations of Zinc and Copper. Table 19 summarizes the impairments by water body within the watershed. The water body (Clarks Creek) located on tribal property was not analyzed as part of the 2012 EPA Water Quality Assessment Report. A .94 mile stretch of creek runs through SIR property with an additional 1.36 miles of drainage on SIR property. SIR has 5 monitoring sites located along Clarks Creek and began collecting data in 2016. Parameters monitored include; Dissolved Oxygen, turbidity, temperature, pH, Ammonia, Total Phosphorous, Nitrite, Nitrate, Kj Nitrogen, Total Nitrogen, E. coli, Total coliform, gas, motor oil, diesel.

**Table 19: Impaired water in East Branch North Fork Feather Basin**

Water Body	Designated Use	Status	Cause of impairment	Source
Little Grizzly Creek	Cold Freshwater Habitat	Impaired	Copper, Zinc	Unknown
Dolly Creek	Cold Freshwater Habitat	Impaired	Copper, Zinc	Unknown

Below is a summary table of the impaired water bodies located on Tribal lands (Table 20).

**Table 20: Surface Water body impaired on Tribal Lands**

<b>Water Body</b>	<b>Designated Use</b>	<b>Status</b>	<b>Cause of impairment</b>	<b>Source</b>
East Barry Creek	Wildlife Habitat	Impaired	E. coli, gasoline, motor oil, diesel	Unknown
	Groundwater Recharge	Impaired	E. coli, gasoline, motor oil, diesel	Unknown
	Cultural Uses	Impaired	E. coli, gasoline, motor oil, diesel	Unknown
West Barry Creek	Wildlife Habitat	Impaired	E. coli, motor oil, diesel	Unknown
	Groundwater Recharge?	Impaired	E. coli, motor oil, diesel	Unknown
	Cultural Uses	Impaired	E. coli, motor oil, diesel	Unknown

## **7.0 DISCUSSION OF NON POINT POLLUTION SOURCES**

Based on land use on reservations land and surrounding reservations lands the SIR has identified the following NPS pollution categories as posing a potential threat to water quality. Of those NPS categories identified below the most quantifiable impairments are 1) runoff of petroleum products, 2) improper disposal of solid waste, and 3) excess fertilizer runoff.

### **Urban/Residential Runoff**

Urban and residential development generally increases the variety and amount of pollutants transported to receiving waters. Increased runoff from paved surfaces and rooftops associated with urbanization commonly carries pollutants such as sediment, oil, grease, heavy metals, salt or sand from winter road maintenance, and toxic chemicals from automobiles. Fertilizers and herbicides are also common constituents of runoff from residential areas. When runoff enters storm drains, these pollutants may be carried directly into adjacent waterbodies.

Urban and residential runoff is primarily a concern on SIR lands in the Susanville area. Runoff from roads and parking areas on the Lower Rancheria may carry pollutants into nearby surface waters. Most stormwater runoff from the Lower Rancheria eventually drains to Paiute Creek, which is not located on SIR property. Paiute Creek is located immediately southwest of the Lower Rancheria and is a tributary to the Susan River (Figure 2). Parking areas associated with the Diamond Mountain Casino and mini mart/gas station pose the highest risk of contributing contaminants to West Barry Creek, which crosses the northeast corner of the Lower Rancheria property (Photo 1). Roadway and residential runoff on the Upper Rancheria may be a source of pollutants to East Barry Creek; however, drainage through vegetated and riprap-lined drainage swales may help filter pollutants before the runoff flows offsite.

### **Livestock Use**

Livestock activities that may contribute to nonpoint source pollution include heavy grazing, hoof impacts, and livestock waste concentration. These impacts are most problematic when livestock

concentrate repeatedly in a small area for water or shade. Heavy grazing removes vegetation that protects soil from erosive forces and may lead to increased sediment delivery to streams and increased water temperatures due to the loss of streamside vegetation. Hoof impacts can destroy streambank vegetative cover and physically break down streambanks. In addition to contributing sediment to the water course, this may lead to channel widening or down cutting and degradation of aquatic and streamside wildlife habitat. Livestock waste concentration can be a source of pathogen and nutrient pollution, especially if livestock concentrate in or near streams.

Livestock activities have been problematic on SIR lands at the Cradle Valley site near Janesville and on the Upper Rancheria in the Susanville area. Past heavy use by livestock at the Cradle Valley site (under previous ownership) resulted in impacts to Clarks Creek including loss of streamside vegetation and direct impacts to the channel. In 2005, this problem was addressed by constructing a fence around the entire Cradle Valley property, which has been effective in minimizing livestock impacts and improving the condition of Clarks Creek and adjacent wetlands (Photo 2). Remaining channel instabilities along Clarks Creek were likely caused by past livestock impacts. Grazing by trespass cattle and pasturing of domestic horses on the Upper Rancheria have impacted springs and ephemeral drainages in the 875-acre East area (Photo 3). Horse pasturing is no longer allowed in this area and the occasional use by trespass cattle has been resolved by the installation of a cattle exclusion fence around the perimeter boundary.

### **Unpaved Road Networks**

Road networks have many impacts on watershed processes and can represent a significant source of nonpoint source pollution. Roads can disrupt natural flows, create new routes for the flow of water, or serve as sources of chemicals and sediment that are introduced into surface waters. Geomorphic effects of roads range from chronic and long-term contributions of fine sediment into streams to large mass failures during high flow events. Roads may alter channel morphology directly or may modify channel flowpaths and effectively increase the density of stream channels in a watershed. Roads affect hydrologic processes by (1) intercepting rainfall directly on the road surface and road cutbanks, (2) intercepting subsurface water moving down the hillslope, (3) concentrating flow, either on the surface or in an adjacent ditch or channel, and (4) diverting or rerouting water from natural flowpaths. Concentrating and rerouting water can accelerate flows in the drainage network during rainstorms resulting in flooding and localized channel erosion. Roads may also divert stream flow from one small drainage basin to another, thus increasing discharge in a receiving channel and increasing the potential for channel erosion. Road networks may also contribute to other problems such as the spread of invasive weed species and destructive human actions (e.g., trash dumping, illegal hunting, fires).

The network of unpaved roads on the Upper Rancheria property appears to be causing significant erosion and sediment mobilization where unpaved roads are intercepting and rerouting water moving across the hillslope (Photo 4). In some areas, roads have intercepted flow from adjacent channels and are acting as new drainage channels (Photo 5). In other areas, flow is being intercepted by roads and diverted into straightened channels/ditches that run along the side of the roadway (Photo 6). Roads also appear to be contributing concentrated flow from roadway surface directly into stream channels (Photo 7). In each case, these flow alterations appear to be

causing localized erosion (Photo 8), changes in channel morphology, and increased sediment delivery to tributaries of West and East Barry creeks. Problems also exist at road crossings where erosion is occurring upstream and downstream of culvert installations (Photo 9). In one area, runoff breached a constructed berm, causing significant erosion downslope (Photo 10).

Based on a visual inspection, unpaved roads at the Cradle Valley site do not appear to be causing significant erosion or modification of site hydrology. In most areas, a vegetative buffer exists between the roads and adjacent Clarks Creek and wetland areas. Fencing has minimized trespass activities at the site, which in the past has included driving through the creek and meadow areas. In 2015, the SIR NRD blocked off one area with large granite boulders where vehicles could access Clarks Creek meadow to prevent further degradation. There are two additional areas that provide vehicle access to the meadow and may require closure in the future. These areas will continue to be monitored closely for trespass activity.

### **Non-native Invasive Plants**

Non-native invasive plants displace native plant species, reduce biological diversity, increase soil erosion, and decrease wildlife habitat. A study of spotted knapweed (*Centaurea calcitrapa*) demonstrated that runoff was 1.5 times higher and sediment yield was three times higher on spotted knapweed-dominated plots than on plots dominated by native bluebunch wheatgrass (Lacey et. al. 1989). The spread of invasive weeds such as tall whitetop (*Lepidium latifolium*) into riparian areas generally results in decreased bank stability, increased erosion and sediment delivery, and increased water temperatures due to loss of riparian vegetation. Control of invasive weeds is extremely important for maintaining watershed health and water quality. Potential impacts of control measures such as herbicides must also be considered, particularly when they are used near waterbodies.

The SIR NRD has identified several noxious weed species on the Upper and Lower Rancheria including dalmation toadflax (*Linaria dalmatica*), spotted knapweed, tall whitetop, and yellow star thistle (*Centaurea solstitialis*). Known locations of noxious weeds have been recorded and are shown on Figure 7. The SIR NRD staff has been working to control noxious weeds and has had success preventing the spread of tall whitetop on the Upper Rancheria. In 2003 and 2004, SIR established study plots to analyze the effects of a variety of treatment techniques (chemical, physical, mechanical, and biological) singly and in combination on five non-native invasive plant species of concern: tall whitetop, yellow starthistle, spotted knapweed, puncturevine (*Tribulus terrestris*), and dalmation toadflax (SIR 2004b). Unfortunately, the study plots were eliminated during residential development of Hammawi Court on the Lower Rancheria. Control and management of noxious weed populations on SIR lands continues to be an ongoing effort.

### **Trespass Activities**

Trespass activities can result in destructive human actions that contribute to nonpoint source pollution. Trespass activities known to occur on SIR lands include illegal wood cutting and driving through streams and meadows at the Cradle Valley site, off-road All-terrain vehicle (ATV) use and illegal trash dumping at the Upper Rancheria site (Photo 11), illegal trash and

green waste dumping at the Herlong site, and illegal fireworks and camping on the Upper Rancheria. Fencing and replacing gates at the Cradle Valley site should minimize the trespass activities in this area. Illegal trash and green waste dumping on the Upper Rancheria and Herlong site is a problem that needs to be monitored on a regular basis. In July 2015, a wildfire started after illegal fireworks were lit on the Upper Rancheria site burning 3 acres of juniper and oak woodland habitat. The 3-acre burned landscape is at high risk for erosion in future years.

**All-terrain Vehicle Use**

All-terrain vehicle use can have undesirable impacts, such as soil disturbance, user-created unplanned roads, and streambank impacts at road crossings, all of which may contribute nonpoint source pollutants. These impacts have been observed on the Upper Rancheria property resulting from ATV use by SIR community members and possibly some trespassers.

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NPS Pollution Category	Subcategory	Source	Impact	
Urban Infrastructure	Residential	Use of lawn care products: Fertilizers, herbicides and pesticides	Runoff of excess fertilizers increases the concentration of nutrients such as Nitrogen and Phosphorous. In high concentrations, these nutrients can lead to eutrophication. Runoff of herbicides and pesticides can lead to accumulation of these toxins in concentrations that can be harmful or fatal to aquatic plants, wildlife, insects, humans and other organisms.	
		Improper storage and/or disposal of household hazardous wastes: paint, petroleum products etc.	Runoff of these products can create toxic conditions for aquatic plants, wildlife, insects, humans and other organisms.	
		Improper disposal of solid waste	Materials such as plastics, metals and other forms of trash that end up in water bodies pose a number water quality issues such as the leaching of harmful chemicals, slow decomposition, present physical hazards to humans and wildlife and degrades asctetics. Plastics, metals and other types of trash often harm animals and plants.	
	Commercial Enterprises	Runoff from parking lots: leaks and spills of petroleum products	Runoff of these products can create toxic conditions for aquatic plants, wildlife, insects, humans and other organisms.	
		Improper disposal of solid waste	Materials such as plastics, metals and other forms of trash that end up in water bodies pose a number water quality issues such as the leaching of harmful chemicals, slow decomposition, present physical hazards to humans and wildlife and degrades asctetics. Plastics, metals and other types of trash often harm animals and plants.	
	Paved Road Ways	Runoff of winter maintenance activities: sand and gravel	Aggregates such as sand and gravel can wash into water way leading to an increase in the sedimentation.	
		Runoff from leaks and spills of petroleum products	Runoff of these products can create toxic conditions for aquatic plants, wildlife, insects, humans and other organisms.	
	Invasive Species	Some are introduced as ornamentals. Others came with early settlers as forage species for livestock Car tires.	They displace native plants and wildlife, increase wildfire and flood danger, clog valuable waterways, degrade recreational opportunities, and destroy productive range and timber lands	
	New construction	Increased runoff from newly exposed soils	Exposed and piled soils are more susceptible erosion leading to an increase in sedimentation of water bodies.	
		Improperly stored/spilled construction supplies: Paint, Petroleum products, etc.	Runoff of these products can create toxic conditions for aquatic plants, wildlife, insects, humans and other organisms.	
	Forestry	Unpaved Roads	Construction of new dirt roads	This activity exposes soils making them more susceptible to erosion, leading to an increase in sedimentation of water bodies.
			Increase use of dirt roads	Increase use of a road by heavy machinery can create ruts in the roads providing a channel for water movement. These channels can begin to down cut, eventually increasing sedimentation.
Timber Harvest		Removal stream bank stability tree	With the removal of vegetation along the stream bank there is a greater potential for erosion of the stream bank, and undercutting.	
		Improper storage of mechanical equipment and associated supplies: petroleum products	Runoff of these products can create toxic conditions for aquatic plants, wildlife, insects, humans and other organisms.	
Timber		Use of chemicals herbicides and	Runoff of herbicides and pesticides can lead to accumulation of these toxins in concentrations that can	

	Plantation	pesticides	be harmful or fatal to aquatic plants, wildlife, insects, humans and other organisms.
Agriculture	Rogue Cattle	Stream bank disturbance	Cattle often sheer stream banks depositing soil into the stream channel where it washes downstream.
		Increase runoff from new exposed soils (hoof prints, over grazing of vegetation)	Cattle often congregate around water sources and cool shaded areas, exposing soil and grazing the vegetation. The newly exposed soil and lack of vegetation increase the erosion potential of the soil
		Cattle Excrement	Urine and manure contain high levels of ammonia, nitrogen and phosphorous. In high concentrations, these nutrients can lead to eutrophication.
			Cattle manure also contains bacteria and viruses, some of which are pathogenic and once in a water body can spread downstream.
	Marijuana Cultivation	Application of Fertilizers, Pesticides, Herbicides	Runoff of excess fertilizers increases the concentration of nutrients such as Nitrogen and Phosphorous. In high concentrations, these nutrients can lead to eutrophication.
			Runoff of herbicides and pesticides can lead to accumulation of these toxins in concentrations that can be harmful or fatal to aquatic plants, wildlife, insects, humans and other organisms.
		Human Excrement	Urine and feces contain high levels of ammonia, nitrogen and phosphorous. In high concentrations, these nutrients can lead to eutrophication.
			Feces contain bacteria and viruses, some of which are pathogenic and once in a water body can spread downstream.
		Improper storage and/or disposal of hazardous wastes: stove fuel, petroleum products	Runoff of these products can create toxic conditions for aquatic plants, wildlife, insects, humans and other organisms.
		Improper storage and disposal of solid waste	Materials such as plastics, metals and other forms of trash that end up in water bodies pose a number water quality issues such as the leaching of harmful chemicals, slow decomposition, present physical hazards to humans and wildlife and degrades asctetics. Plastics, metals and other types of trash often harm animals and plants.
Diversion of water bodies	This activity decreases water depended wildlife habitat by decreasing flow and increasing temperature.		
Recreation	On/off road vehicle use	Unpaved road network use	Increase use of a road can create ruts in the roads providing a channel for water movement. These channels can begin to down cut, eventually increasing sedimentation.
	Camping	Improper storage and disposal of solid wastes	Materials such as plastics, metals and other forms of trash that end up in water bodies pose a number water quality issues such as the leaching of harmful chemicals, slow decomposition, present physical hazards to humans and wildlife and degrades asctetics. Plastics, metals and other types of trash often harm animals and plants.
		Human Excrement	Urine and feces contain high levels of ammonia, nitrogen and phosphorous. In high concentrations, these nutrients can lead to eutrophication.
			Feces contains bacteria and viruses, which can be pathogenic and can spread downstream.
Improper storage and/or disposal of hazardous wastes: stove fuel, petroleum products	Runoff of these products can create toxic conditions for aquatic plants, wildlife, insects, humans and other organisms.		

Monitoring of water bodies location on Susanville Indian Rancheria trust lands has revealed that the certain designated uses are impaired due to elevated levels of E. coli, and the presence of petroleum products such as gasoline, motor oil and diesel. Although the specific source of these impairment is unknown there are few potential sources that need to be further investigated. These sources include urban infrastructure, agriculture, forestry, and recreation. These potential sources of impairment are described further below.

### **Impacts to West Barry Creek**

- West Barry Creek is impacted by high levels of E. coli at all 3 monitoring locations.
  - WBC-UR1 Potential sources include: wildlife, groundwater contamination, or runoff from higher elevations.
  - WBC-LR1/LR2 potential sources include: wildlife, groundwater contamination, residential, commercial enterprise, runoff from higher elevation land use.
- West Barry Creek is impacted by the presence of petroleum products on the 2 lower monitoring sites located above and below the Diamond Mountain Casino/Hotel/Mini Mart parking lot.
  - The most likely source of pollution is from the commercial enterprises and paved roads/surfaces.
- Lower West Barry Creek is impacted by the presence of solid waste.
  - The most likely source of pollution is from commercial enterprises and upstream residences.

### **Impacts to East Barry Creek**

- East Barry Creek is impacted by high levels of E. coli at all 2 of the 3 monitoring locations.
  - EBC-UR1 Potential sources include: wildlife, groundwater contamination, or runoff from higher elevations.
  - EBC-UR3 Potential sources include: wildlife, groundwater contamination, or runoff from higher elevations.
  - EBC-UR2 is sampled from a fairly well enclosed spring box and E. coli does not frequently appear at this site...so groundwater is not likely contaminated
- East Barry Creek is impacted by the presence of petroleum product at all 3 sampling sites
  - Potential sources include: unpaved road runoff, contaminated groundwater, paved roads, unknown source

## **8.0 SELECTION OF BEST MANAGEMENT PRACTICES**

### **8.1 SUMMARY OF CURRENT MANAGEMENT ACTIVITIES**

Current measures to abate nonpoint source pollution on SIR tribal lands are directed by SIR NRD staff. The SIR received program eligibility status from the EPA Region 9, through Section 106 of the CWA to develop a tribal water pollution management program. With funding from the EPA, the Tribe is working to encourage the implementation of practices, including development

of a long-term water quality monitoring program for surface and groundwater, that will permit the development of Tribal Water Quality Standards (WQS) and setting Total Maximum Daily Loads (TMDLs), if appropriate. The SIR Water Quality Monitoring Program Quality Assurance Project Plan (QAPP) (JBR 2006) was approved by the EPA and water quality monitoring began in fiscal year 2007. The SIR NRD updated the QAPP in 2016.

The SIR has developed an ordinance prohibiting the discharge of any pollutants into the waters of the SIR addressing Section 504 of the CWA. The ordinance was enacted in 2003 as an emergency measure to maintain the quality of Rancheria waters until such time as the SIR Tribal Business Council can enact a new water ordinance comprehensively regulating water quality and the discharge of pollutants on the SIR. In addition, stream corridor protection zones have been established as part of the land use plan for the Upper Rancheria. These buffer zones are intended to help protect natural resources, including water quality, in light of future growth planned for this area.

The SIR NRD received grants from the U.S. Fish and Wildlife Service (USFWS) and USDA Natural Resources Conservation Service (NRCS) to install livestock exclusion fencing around the perimeter of the Cradle Valley property, to decrease hazardous fuel loads by removing small diameter conifers, and to revegetate degraded areas with native plants. Benefits of the fencing project and livestock exclusion are evidenced by vegetation and beaver reestablishment along Clarks Creek. USDA Forest Service (USFS) funding was also obtained to implement a forest thinning project to improve forest health and reduce the risk of catastrophic wildfire at the Cradle Valley site.

With funding from the EPA Region 9 Pesticide Program, the SIR NRD established study plots to analyze the effects of a variety of treatment techniques (chemical, physical, mechanical, and biological) singly and in combination on five non-native invasive plant species of concern: tall whitetop, yellow starthistle, spotted knapweed, puncturevine, and dalmation toadflax. Under the weed abatement program, the SIR has successfully prevented the spread of tall whitetop on the Upper Rancheria property.

Best management practices (BMPs) for the control of nonpoint sources of pollution will be selected based on various factors including information provided by representatives from the following SIR Departments: the TBC, NRD staff, Public works, Diamond Mountain Casino and SIRCO. Subsequently, Implementation of BMPs will be accomplished through a number of nonpoint source pollution programs, funding mechanisms, and educational programs conducted by the Tribe in conjunction with federal and state agencies. Some of the federal government agencies that will or have contributed to a nonpoint source pollution control program are included in Table 22.

**Table 22: Core Participants for BMP's**

<b>Participant</b>	<b>Role</b>
Tribal Business Council (TBC)	Lead participant. Sets strategic policies and provides legal authorization for NRD activities The TBC will review and pass relevant resolutions on ordinances to control pollutants entering the waters of the SIR.
Natural Resources Department	Provides operational lead to surface water and groundwater monitoring and pollution control activities on tribal properties. Conducts and oversees funding, implementation, and evaluation of monitoring programs and BMPs. Conducts and oversees educational programs for pollution reduction. Assists in the development of ordinances that support water quality and sustainable economic development of SIR. Compiles data to identify existing and potential nonpoint source water quality problems.
Public Works Department	Provides operational lead for road construction, repair, and maintenance work on tribal lands
US EPA -PPG	Provides technical and financial support for a number of SIR programs including: CWA 106, CWA 319, and invasive weed program
USDA Natural Resource Conservation Service	Provides technical resources, coordination, and funding for a number of projects on SIR lands including: fuel reduction projects, livestock exclusion fencing, and revegetation of native plants.
RCAC	Provides technical support (O&M) through USEPA supported circuit riders on the public water utilities.
U.S. Fish and Wildlife Service (USFWS)	Supplied funding to install livestock exclusion fencing around the perimeter of the Cradle Valley property,
US Forest Services	Implement projects in relationship to cultural resources protection, enhancement of traditional or ethonobotanical resources and in watershed restoration efforts
Bureau of Indian Affairs	Under the Indian Self Determination the SIR receives technical support from BIA for its land management efforts
Bureau of Land Management	Partnerships and networking for natural resources protection
Honey Lake Valley Resource Conservation District (RCD)	Partnerships through the Lahontan Basin Integrated Regional Water Management Plan and the Lassen county Special Weed Action Team (SWAT)

## **9.0 NON POINT SOURCE CONTROL PROGRAM**

Several programs and projects have been undertaken to address nonpoint source impacts to water quality on the SIR tribal lands, and more are currently underway. These include pollution prevention, public outreach and education programs, reseeded, implementing sediment movement control measures, fuel-reduction, forest-thinning projects and invasive weed control which are described in more detail below.

### **Urban/Residential Runoff**

New developments should attempt to maintain the volume of runoff at predevelopment levels by using structural controls and low-impact development techniques to minimize stormwater runoff. Pollution prevention strategies should also be considered when planning future developments. Parking areas associated with the Diamond Mountain Casino and mini mart/gas station require stormwater drains equipped with catch basin inserts to filter out hydrocarbons and sediments, preventing possible contaminants from reaching West Barry Creek. Public education and implementation of “Drains to Creek” signage at storm drain inlets are possible tools that may be employed by the SIR to minimize urban/residential runoff impacts.

### **Construction Activities**

Construction activities on tribal lands are subject to CWA regulations. Construction projects on SIR tribal lands that disturb one acre of land or more must obtain a storm water discharge permit issued under the National Pollutant Discharge Elimination System (NPDES) (EPA, 2004). The EPA Region 9 is the permitting authority for the NPDES program for projects occurring on tribal lands within the State of California. Operators of regulated construction sites are required to submit a Notice of Intent (NOI) to comply with the Construction General Permit (CGP) to the EPA. A Storm Water Pollution Prevention Plan (SWPPP) must be prepared for the project prior to submittal of the NOI. A SWPPP describes the relevant BMPs for preventing potential water quality impacts from construction-related or operational sources of pollution. Examples of typical construction site BMPs include mulching of exposed soils, installation of silt fencing, and spill prevention and response procedures. The California Stormwater BMP Handbook, developed by the California Stormwater Quality Association (CASQA, 2003), provides guidance on stormwater BMPs for construction sites.

### **Livestock Use**

Fencing installed around the entire Cradle Valley property has been effective in minimizing livestock impacts and improving the condition of Clarks Creek and adjacent wetlands. Some channel incision can be observed and localized erosion is still occurring in some locations along the channel. These problems were likely caused by heavy livestock use in the past and are expected to improve over time as the area regenerates. SIR NRD staff will monitor the fenceline and Clarks Creek to ensure that conditions continue to improve and incision and channel erosion do not get worse.

The SIR TBC passed an ordinance prohibiting the unrestricted use by horses and cattle on the Upper Rancheria. Problems due to trespass livestock were reduced when fencing was installed along the entire perimeter of the Upper Rancheria property. SIR NRD staff will need to monitor the Upper Rancheria for breaks in the fenceline and evidence of grazing.

### **Unpaved Road Networks**

An inventory of unpaved roads on the Upper Rancheria was undertaken in 2014 to identify areas where roads were affecting surface flows and causing erosion, but additional surveys are needed. The areas need to be prioritized for treatment and monitored on a regular basis. Aerial photograph analysis could be conducted to identify new two-track roads, stream crossings, and potential erosion sources. Soil survey data could also be evaluated to determine areas with high erosion potential. An additional field inventory should include driving or walking all roads on the property while evaluating road, culvert, and stream crossing conditions and estimating past and potential sediment inputs. The road survey would also assess concentrated water runoff areas, channel incision, gullies, and other erosional features. Stream crossing data would describe the type of crossing (e.g. culvert, ford, etc.), culvert diameter, condition, future erosion potential, and any corrective measures needed. Areas would be prioritized based on potential for future erosion, potential sediment delivery to a watercourse, accessibility, and cost-effectiveness of treatment needed to minimize future sediment inputs. Once a road inventory is completed, the SIR would be able to evaluate whether any of the roads can be decommissioned. This process would require input from SIR community members and other potential stakeholders. If a roadway is removed, the area can be recontoured and revegetated to restore natural conditions. If problems are occurring along roads that cannot be decommissioned, stabilization methods should be employed to minimize future erosion.

### **Non-native Invasive Plants**

SIR NRD staff has mapped locations of invasive species on SIR tribal lands and has been working to control the spread of noxious weeds. Funding from EPA Region 9 Pesticide Program allowed the SIR to analyze the effects of a variety of treatment techniques on five non-native invasive plant species. As part of their weed abatement program, the SIR has successfully prevented the spread of tall whitetop on the Upper Rancheria property. Control of non-native, invasive plants on SIR lands is an ongoing effort. Due to the nature of weedy plants, annual field surveys are needed on tribal properties and baseline surveys will be needed on all new land acquisitions.

### **Trespass Activities**

Fencing installed at the Cradle Valley site should minimize the trespass activities in this area. In addition, all “cowboy gates” at the Cradle Valley site should be replaced with permanent locking gates making trespass at road access points more difficult. Trash dumping at the Upper Rancheria continues to be a problem and should be monitored on a regular basis. When trash dumping is discovered, it should be addressed as soon as possible to prevent additional trash from accumulating on the site. Fencing and signage that was installed on the Upper Rancheria in

2015 has helped reduce illegal trash dumping and trespass activities. Fencing and signage will need to be monitored on a regular basis.

### **All-terrain Vehicle Use**

ATV impacts can be a difficult to address as ATV users often do not want restrictions placed on where they can ride. Development of an ATV management plan could help reduce impacts, particularly in sensitive areas, by designating areas to allow ATV use and areas to avoid. An ATV management plan would require input and approval from the SIR community members in order to be successful. In 2015, signs stating “No off-roading” and “No ATVs” were placed at access points around the Upper Rancheria in an attempt to minimize damage from ATVs.

As indicated above, the following are management activities that have been implemented or are currently under way by SIR:

- Implementation of a water quality monitoring program;
- Development of an ordinance prohibiting the discharge of any pollutants into the waters of the SIR addressing section 504 of the CWA;
- Installation of fencing to reduce trespass livestock and reduce trash dumping on the Upper Rancheria;
- Installation of signage to reduce off-road vehicle trespass at the Upper Rancheria;
- Installation of livestock exclusion fencing on the perimeter of the Cradle Valley property;
- Re-vegetation of degraded areas with native plants on the Cradle Valley property;
- Implementation of a forest thinning project to improve forest health and reduce the risk of catastrophic wildfire at the Cradle Valley site;
- Establishment of treatment study plots on non-native invasive plant species of concern and some eradication of invasive weed species;
- An inventory of unpaved roads on the Upper Rancheria was undertaken in 2014 to identify areas where roads were affecting surface flows and causing erosion;
- Establish a residential storm water management program to reduce the amount of water pollutants that infiltrate waterways;
- Recycle automotive fluids, paints, solvents and cleaners or dispose of them as hazardous materials;
- Maintain landscaping properly - Establish an erosion control program before construction begins;
- Clean up spills
- Vehicle and equipment maintenance: inspect frequently for leaks
- NRD is working closely with EPA Circuit Riders from RCAC on efficient management of the public water systems;
- SIR public works department considers pollution prevention strategies when planning future development;
- Parking areas associated with the Diamond Mountain Casino and mini mart/gas station stormwater drains are equipped with catch basin inserts to filter out hydrocarbons and sediments, preventing possible contaminants from reaching West Barry Creek.

- SIR is considering implementation of “Drains to Creek” public education signage at storm drain inlets as a possible tool to minimize urban/residential runoff impacts

## **10.0 CONCLUSIONS**

As discussed in this assessment, the SIR waterways have non-point source issues. These include erosion, and sedimentation. The most likely sources of nonpoint source pollution on SIR tribal lands are pollutants originating from. The SIR NRD has identified several potential sources of nonpoint source pollution that need to be addressed. The most likely sources of nonpoint source pollution on SIR tribal lands are pollutants originating from:

- Urban/residential runoff,
- Construction activities,
- Livestock use,
- Unpaved road networks,
- Non-native invasive weeds,
- Trespass activities, and
- All-terrain vehicle use

As discussed elsewhere, the following are management activities that have been implemented or are currently under way by SIR:

- Implementation of a water quality monitoring program;
- Development of an ordinance prohibiting the discharge of any pollutants into the waters of the SIR addressing section 504 of the CWA;
- Installation of catch basin insert filters in the Casino and gas station parking area;
- Installation of fencing to reduce trespass livestock and reduce trash dumping on the Upper Rancheria;
- Installation of signage to reduce off-road vehicle trespass at the Upper Rancheria;
- Installation of livestock exclusion fencing on the perimeter of the Cradle Valley property;
- Re-vegetation of degraded areas with native plants on the Cradle Valley property;
- Implementation of a forest thinning project to improve forest health and reduce the risk of catastrophic wildfire at the Cradle Valley site; and
- Establishment of treatment study plots on non-native invasive plant species of concern and some eradication of invasive weed species

Each issue will be addressed in the long term using existing regulatory and management programs, a CWA Section 319 Nonpoint Source Management Program, and on-the-ground projects funded by various sources including, but not limited to, CWA Section 319(h) funding. SIR NRD will strive to work with the relevant SIR departments and other identified agencies to identify new problems not identified in this assessment and recommend solutions to them and the issues herein. Also, management changes will be incorporated into day to day operations to minimize and mitigate nonpoint source pollution. Implementation of a CWA Section 319(b) Nonpoint Source Management Program Plan will provide the framework for selection and implementation of best management practices and nonpoint source pollution mitigation

strategies. The following are potential nonpoint source control management recommendations for the SIR:

- Signage on storm drain inlets;
- Implementation of BMPs on construction sites;
- Development of a roadway inventory and identification of mitigation to decommission or stabilize roads that are affecting surface flows;
- Control of invasive plants; and
- Development of an ATV management plan.

Continued implementation of existing management programs, as well as additional management recommendations provided in this report should help improve water quality conditions and prevent degradation of SIR water resources.

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## 11.0 REFERENCES

- California Department of Health Services Division of Drinking Water and Environmental Management, 2006. Drinking Water Source Assessment and Protection Program. Source Water Assessments – Public Access. (<http://swap.ice.ucdavis.edu/TSinfo/TSsearch.asp>)
- CDWR, 2000. *California's Groundwater*. Bulletin 118. "Draft Groundwater Basin Map, Draft 1." August 22, 2000. California Department of Water Resources, Division of Planning and Local Assistance. (Maps and basin descriptions available at the website: [www.waterplan.water.ca.gov/groundwater/gwb118intro.htm](http://www.waterplan.water.ca.gov/groundwater/gwb118intro.htm).)
- DWR (California Department of Water Resources, Northern District). 1975. Lassen County Land Uses and Water Demands. 75 p.
- Feather River Coordinate Resource Management Group (FRCRMG). 1996. 1985-1995 Accomplished Projects Summary. (<http://www.feather-river-crm.org/factsheets/fact2.htm>)
- Feather River Coordinate Resource Management Group (FRCRMG). 2001. Proposition 204 Final Report. Clarks Creek - Summer, 2001.
- JBR Environmental Consultants, Inc. 2006. Susanville Indian Rancheria Water Quality Monitoring Quality Assurance Project Plan, April 26, 2006.
- JBR Environmental Consultants, Inc. 2003. Susanville Indian Rancheria 875-Acre Property Fee-to-Trust Transfer Environmental Assessment, July 2003.
- Handman, E.H., C.J. Londquist, and D.K. Maurer. 1990. Ground-Water Resources of Honey Lake Valley, Lassen County, California, and Washoe County, Nevada. US Geological Survey Water-Resources Investigations Report 90-4050, 112 p., 4 plates, scale 1:250,000.
- Lacey, J.R., C.B. Marlow, and J.R. Lane. 1989. Influence of spotted knapweed (*Centaurea maculosa*) on surface water runoff and sediment yield. *Weed Technol.* 3:627-631.
- NRCS/USDA 2015. Soil of Susanville Area, Parts of Lassen and Plumas Counties, CA Part 1
- Rose, T.P., M.L. Davisson, G.B. Hudson, and A.R. Varian. 1997. Environmental Isotope Investigation of Groundwater Flow in the Honey Lake Basin, California and Nevada. Lawrence Livermore National Laboratory, UCRL-ID127978. 42 p. (July 1997)
- Susanville Indian Rancheria (SIR). 2003. Narrative Statement for the Susanville Indian Rancheria CWA Section 106 Water Pollution Control Program Financial Assistance Eligibility. March 17, 2003.
- Susanville Indian Rancheria (SIR). 2004. The Susanville Indian Rancheria Master Plan.

- Susanville Indian Rancheria, Environmental Protection Department (SIR NRD). 2004b. Evaluating Management Methods for Five Non-Native Invasive Plant Species: Perennial Pepperweed (*Lepidium latifolium* L), Yellow Starthistle (*Centaurea solstitialis* L), Spotted Knapweed (*Centaurea maculosa*), Puncturevine (*Tribulus terrestris* L), and Dalmation Toadflax (*Linaria genistifolia* ssp. *dalmatica*). September, 2004.
- Susanville Indian Rancheria Non Point Source Pollution Assessment and Management Plan Prepared by JBR Environmental Consultants, Inc, October 6, 2006
- U.S. Army. 1979. Installation Assessment of Sierra Army Depot, Report No. 149. Prepared by U.S. Army Toxic and Hazardous Materials Agency.
- U.S. Army Corps of Engineers, Mobile District. 1998. Environmental Assessment for the Disposal and Reuse of the BRAC Parcels at Sierra Army Depot, California, February 1998.
- U.S. Army Corps of Engineers and Tetra Tech, Inc., Mobile District. 1999. Final Supplemental Environmental Assessment of BRAC Excess Property at Sierra Army Depot, California, September 1999
- U.S. Department of Agriculture, Forest Service, Forest Health Protection, Pacific Southwest Region (USFS FHP). 2004. Evaluation of the Cradle Valley Property (FHP Report NE04-06). July 6, 2004.
- U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). 2004. Soil Survey of Susanville Area, Parts of Lassen and Plumas Counties, California.
- U.S. Environmental Protection Agency (EPA). 2004. Clean Water Act Requirements for Construction Projects in Indian Country. EPA-909-F-04-008. August 2004. (<http://www.epa.gov/region09/water/tribal/pdf/tribalswmgmt.pdf>)
- U.S. Environmental Protection Agency (EPA). 2006. Polluted Runoff (Nonpoint Source Pollution). Available online at: <http://www.epa.gov/nps/MMGI/Chapter1/ch1-1.html>
- Wingate, George. 2006. Hydrologist, Bureau of Land Management, Eagle Lake Field Office. Personal communication with Hannah Visser, JBR Environmental Consultants, Inc., Reno, Nevada. July 18, 2006.
- Winzler and Kelly Consulting Engineers, 2005. Phase II Environmental Site Assessment, Susanville Indian Rancheria trust Lands Sierra Army Depot, Lassen County, Herlong, California, September 2005.
- WQM QAPP Susanville Indian Rancheria, CA 2016

Existing Vegetation - CALVEG, [ESRI personal geodatabase]. (2004). McClellan, CA: USDA-Forest Service, Pacific Southwest Region. EvgTile03B\_99\_04\_v2. [2009].

## **FIGURES**

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## **APPENDIX A**

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## **SOIL EROSION HAZARD DATA**

**APPENDIX B**

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**PHOTOS**

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