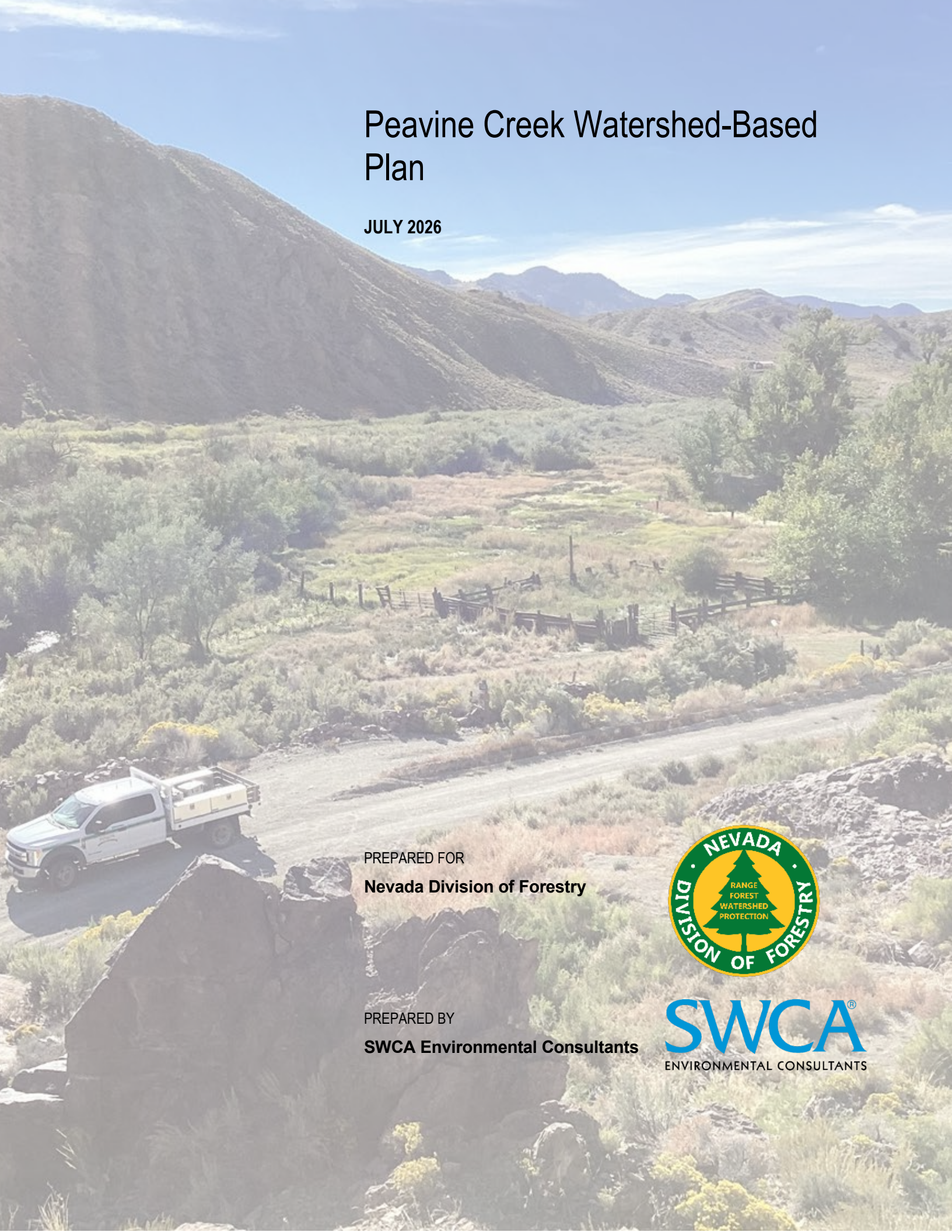
Peavine Creek Watershed-Based Plan

JULY 2026



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ACKNOWLEDGMENTS

Water quality and watershed issues are complex, multi-faceted, and at times contradictory. Establishing and maintaining effective stewardship requires cooperation between local municipal governments, stakeholder groups, and various management and regulatory agencies. It is only with continued cooperation that we will collectively improve water quality and watershed health in the Peavine Creek watershed.

The contents of this Peavine Creek Watershed-Based Plan are the sole responsibility of the Nevada Division of Forestry. However, the process leading to the document's final creation was a collaborative effort with many valuable contributions of time, energy and input from multiple entities in addition to our own excellent personnel. The Nevada Division of Forestry thanks the following entities for their participation and guidance in the production of this plan:

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PEAVINE CREEK WATERSHED-BASED PLAN

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1 INTRODUCTION

As part of an ongoing commitment to protect natural resources, Nevada Division of Forestry (NDF) has developed the Peavine Creek Watershed-Based Plan (WBP). This plan was developed using the U.S. Environmental Protection Agency (EPA) nine-element watershed planning process outlined in the *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* (EPA 2008) and includes input and involvement from watershed partners and local, state, and federal agencies in the region. The goal of developing the Peavine Creek WBP was to build partnerships, assess water body and watershed conditions, develop a framework to prioritize implementable recommendations and management actions to address water quality concerns in the watershed, and identify milestones and indicators to measure progress as projects are implemented.

1.1 Planning Area and Background

The Peavine Creek watershed (Hydrologic Unit Code [HUC]10: 1606000305) covers approximately 111,000 acres in northern Nye County, Nevada, within the Southern Big Smoky Valley sub-basin (HUC8: 16060003) and the Great Basin–Mojave Desert region (Figure 1-1) (EPA 2026a). The watershed includes the headwaters, tributaries, and uplands draining to Peavine Creek from high elevations near the Arc Dome Wilderness southward to the Big Smoky Valley (U.S. Forest Service [USFS] 2025a). It falls under Nye County jurisdiction and is subject to oversight by agencies including the Nevada Division of Environmental Protection (NDEP) and the Nevada State Engineer, under Nevada Water Law (Nevada Revised Statutes 533 and 534), which governs beneficial use, resource protection, and appropriative water rights.

The 2004 *Nye County Water Resources Plan* established long-term (50-year) water resource planning goals, identified county-wide issues, and provided management guidance (Buqo 2004). However, prior to this effort, no watershed-specific planning document existed for the Peavine Creek watershed.

In 2025, the NDF engaged SWCA Environmental Consultants (SWCA) to develop an EPA nine-element WBP for the Peavine Creek watershed. Peavine Creek and its tributaries form an ecologically important high-elevation system that supports livestock irrigation, aquatic life, wildlife, and domestic and recreational uses. Like many arid Nevada watersheds, it faces potential pressures including sediment and nutrient loading from upland erosion, legacy mining impacts, rangeland degradation, altered hydrology, and invasive species. Water quality data are limited due to historically low monitoring and the lack of infrastructure such as stream gauges. As a result, watershed conditions have not been fully assessed (see Section 3.4). Because there is insufficient data to determine whether beneficial uses are impaired or fully supported, this plan functions as a protective WBP. It identifies potential pollution sources, recommends management measures to address them, and outlines monitoring actions to address key data gaps.

Watershed planning is iterative and adaptive. Development of this plan followed multiple phases (Figure 1-2) consistent with EPA (2008) guidance. Initial stakeholder engagement helped identify priority water quality concerns, watershed management challenges, and key partners for implementation (see Section 1.3). The watershed was then characterized through a comprehensive review of existing data on population, climate, land use, soils, geology, hydrology, and pollutant sources affecting water quality and watershed health. Based on this characterization, an implementation plan was developed outlining short-, mid-, and long-term actions to address identified issues. The plan also includes a monitoring framework to track progress and support adaptive management. Completion of this EPA-compliant WBP positions the NDF to pursue Section 319 grant funding and other state or Natural Resources Conservation Service (NRCS) cost-share programs, supporting on-the-ground projects that reduce nonpoint source pollution and protect beneficial uses over the long term in the Peavine Creek watershed.

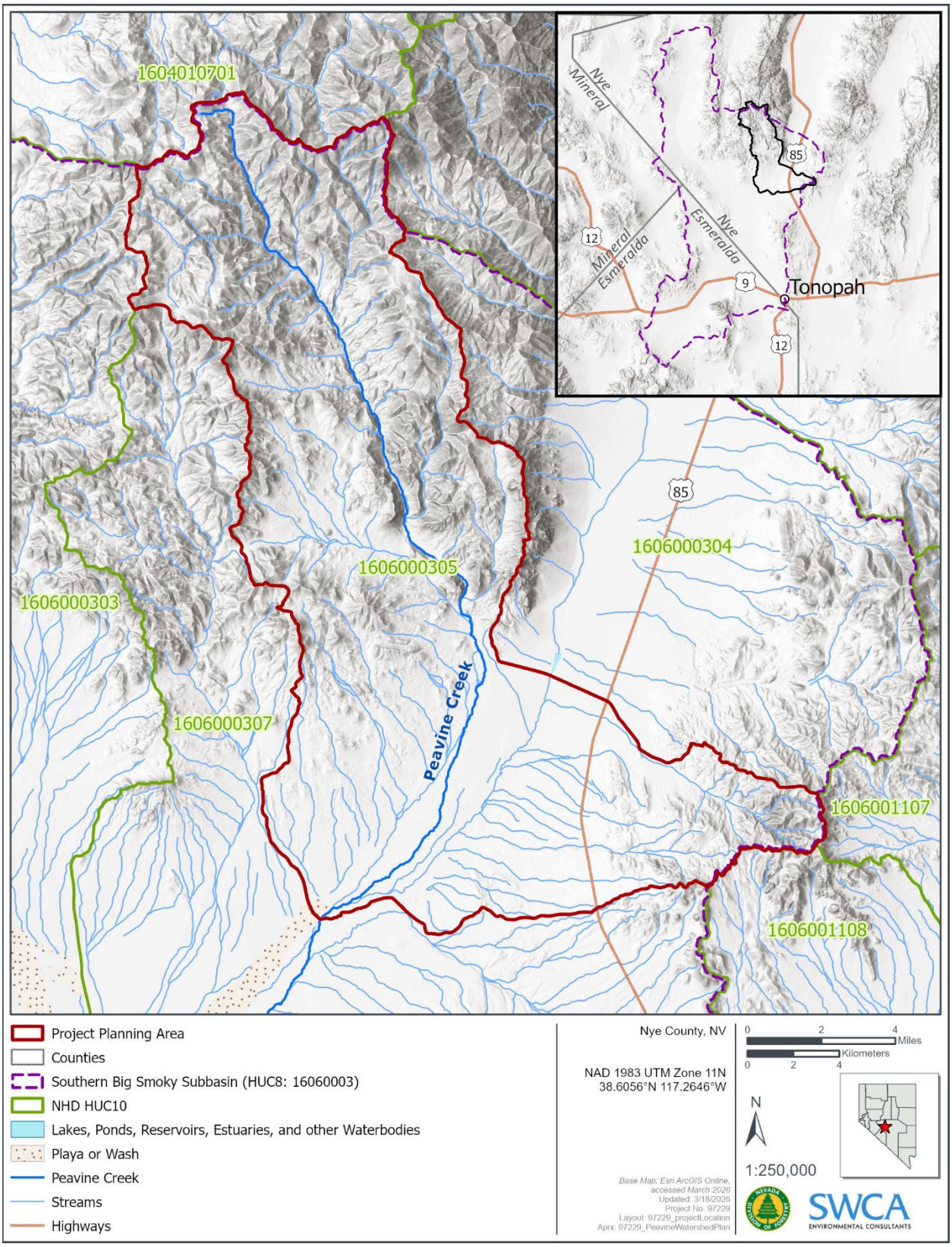


Figure 1-1. Peavine Watershed-based Plan planning area.

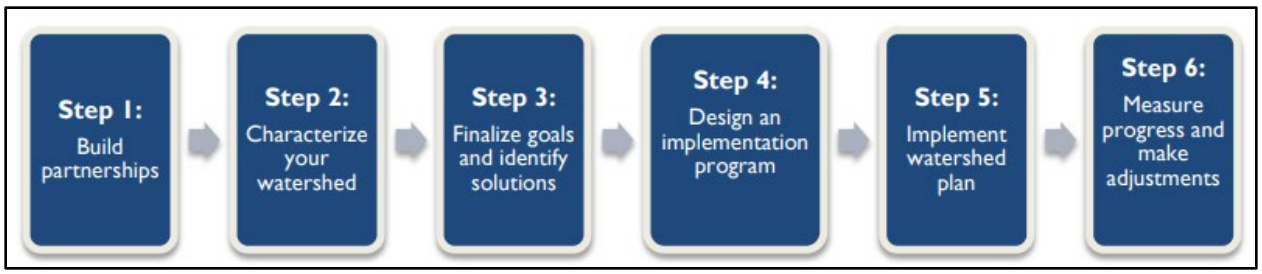


Figure 1-2. Steps in the watershed planning process.
Source: EPA 2008

1.2 Nine Elements of Watershed Planning

A WBP is a consensus-based, nonregulatory process in which natural resource owners, managers, land users, and other stakeholders collaborate to identify and address significant sources of pollution and stressors affecting surface waters within a defined area (EPA 2008). EPA nine-element watershed plans provide a standardized analytical framework for restoring impaired waters and protecting watershed health. These plans guide local communities, watershed groups, and agencies in addressing water quality issues and meeting eligibility requirements for Clean Water Act (CWA) Section 319 funding. The nine required elements are listed in Table 1-1, along with the sections of this plan that address each element.

Table 1-1. EPA Nine Elements and Associated Watershed Plan Report Section

EPA Element	Description	Associated Section
a	Identify causes and sources of pollution	Section 3.2
b	Estimate pollutant loading in the watershed and expected load reductions	Sections 3.5 and 4.1
c	Describe management measures to achieve load reductions and target critical areas	Section 4.1
d	Estimate amounts of technical and financial assistance and the relevant authorities needed to implement the watershed plan	Section 4.2
e	Develop an information and education component	Section 4.3
f	Develop a project schedule	Section 4.4
g	Describe the interim, measurable milestones	Section 4.5
h	Identify indicators to measure progress	Section 4.5
i	Develop a monitoring component	Section 4.6

1.3 Building Partnerships

Addressing nonpoint source pollution in the Peavine Creek watershed began with identifying and convening key stakeholders at the resident, watershed, county, state, and federal levels. A Peavine Creek watershed stakeholder group was formed to provide input and guidance to NDF and SWCA throughout the planning process.

The stakeholder group's role was to:

- Provide contextual information about the watershed
- Help prioritize resource concerns to guide watershed management decisions

- Review interim planning products
- Share information about the planning process and watershed plan with the public

Membership represented a range of watershed interests, including landowners, agricultural producers, recreationists, water users, and agency decision-makers. Participants included:

- NDF
- NDEP
- Nevada Department of Wildlife (NDOW)
- Bureau of Land Management (BLM)
- USFS
- Nye County
- Private landowners

On October 14, 2025, an initial stakeholder meeting was held to review the planning scope, goals, timeline, funding considerations, and opportunities for public engagement. On November 13, 2025, a watershed tour was conducted where SWCA, NDF, landowners, and other agencies visited specific locations in the watershed to understand management challenges and resource concerns. Participants observed examples of watershed stressors to develop a shared understanding of factors affecting watershed health. In February 2026, a series of meetings were held to refine the vision and goals and discuss key management measures and critical areas for implementation projects.

Stakeholders identified several key watershed stressors: streambank erosion, overgrown riparian vegetation, diversions, spring runoff flooding, unpaved roads, recreation, and grazing. Although no water quality impairments are currently documented in the watershed (see Section 3.1), several parameters were identified as priority concerns:

- Sediment below Peavine Creek Campground, likely associated with channel incision and flooding from Dry Canyon
- Dissolved oxygen (DO) and temperature in the lower reaches of Peavine Creek, potentially influenced by water diversions and channel migration related to vegetation changes and flooding
- Phosphorus, with uncertain sources that may include natural soil background levels, streambank erosion, and agricultural practices

Stakeholder input also identified additional resource concerns that informed development of the watershed implementation plan (Table 1-2) (see Section 4).

Table 1-2. Resource Concerns Identified by the Peavine Creek Watershed Plan Stakeholders

Resource	Specific Issue or Resource Concern
Water quality	Sediment issues below Peavine Creek Campground, likely associated with channel incision and flooding from Dry Canyon.
	Potential water quality issues in the lower portion of Peavine Creek influenced by water diversions and channel migration related to vegetation changes and flooding events.
	Total phosphorus with sources not fully understood but potentially related to natural background levels in soils, soil erosion, and agricultural practices.

Resource	Specific Issue or Resource Concern
Recreation	Overland travel and off-road stream crossings by all-terrain vehicles have the potential to contribute to sediment loading to streams.
	Recreational users constructing temporary dams in Peavine Creek for wading and fishing, which can reduce or temporarily stop flows to downstream private landowners.
Noxious and invasive species	Russian olive (*Elaeagnus angustifolia)* and tamarisk (*Tamarix* spp.) affecting the riparian corridor and potentially altering flow conditions in Peavine Creek.
Water supply	Accurate water supply measurements are important as drought conditions continue in the watershed.
	Instream flows are reduced due to drought.
	Water is lost in the distribution system via seepage during conveyance in diversions.
Wildlife	Maintaining and improving wildlife habitat is important to local stakeholders as the area is used for hunting opportunities.
	Maintaining and improving water quality and water quantity is important for aquatic life.
Grazing management	Maintaining range health is important to local stakeholders and producers.
	In certain areas of the watershed, livestock may be impacting riparian areas and water quality. Impacts could include nutrient and *E. coli* loading, streambank erosion, and deposition of fecal material in and around streams.
Fire management	Proactive management is needed to reduce the risk of fire and to mitigate post-fire impacts such as flooding and erosion.

1.4 Watershed Plan Goals and Objectives

Based on information gathered from existing material and initial stakeholder meetings, overarching watershed goals were identified as follows:

1. Protect and improve water quality within the Peavine Creek watershed.
2. Improve and maintain the chemical, physical, and biological conditions of the watershed that benefit the environment for present and future generations.

The specific objectives identified to support the achievement of these goals are as follows:

A. Develop a framework of mutually beneficial management actions and solutions that can be implemented by local stakeholders to address water quality and other resource concerns in the watershed.

B. Protect and restore riparian stream areas.

C. Manage the watershed to reduce wildfire risk and impacts.

D. Prevent and manage invasive vegetation that threatens watershed health.

E. Protect and improve wildlife habitat throughout the watershed.

F. Work with relevant regulatory agencies to develop and implement strategies that ensure adequate flow in Peavine Creek.

G. Increase education, awareness, and collaboration in the watershed.

H. Expand existing water quality monitoring to fill data gaps.

2 WATERSHED CHARACTERIZATION

Watershed characterization involves compiling, reviewing, and analyzing available data to understand watershed conditions and identify potential impairments and pollutant sources (EPA 2008). This step is critical for informing management actions and identifying areas where pollutant loading may occur. Based on a synthesis of existing data and independent analyses, this WBP characterizes the Peavine Creek watershed in terms of natural features (Section 2.1), social and human features (Section 2.2), and water resources (Section 2.3).

2.1 Natural Features

2.1.1 Climate

The Great Basin–Mojave Desert region has a highly variable and extreme climate (Hidy and Klieforth 1990). Nevada's basin and range landscape, with more than 300 mountain ranges, and the Sierra Nevada along the state's western boundary strongly influence precipitation and vegetation patterns (Charlet 2020; NDOW 2022). Orographic effects create a pronounced precipitation gradient, with mountain ranges receiving substantially more precipitation than adjacent basins (NDOW 2022).

The Peavine Creek watershed experiences a semiarid, high-elevation climate typical of interior Great Basin watersheds, characterized by hot, dry summers and cold, snowy winters. Elevation ranges from about 9,500 feet near the headwaters to approximately 4,900 feet in the Big Smoky Valley, creating local variation in temperature and precipitation (Figure 2-1). These climatic patterns strongly influence watershed hydrology.

Precipitation data from the National Centers for Environmental Information Tonopah weather station (USC00268160), southeast of the project area, indicate average monthly precipitation of 0.42 inch of rain and 2.01 inches of snow from 2015–2025 (Figure 2-2) (National Oceanic and Atmospheric Administration [NOAA] 2025). Approximately 84% of precipitation falls as snow, primarily between November and March, though snowfall has occurred as early as October and as late as May. Snowmelt is therefore a key driver of seasonal streamflow.

Snowpack data from the Big Creek Summit snow telemetry station (Site #337), about 40 miles north of the watershed at 8,710 feet, show that snowpack and snow water equivalent (SWE) accumulate through winter and typically peak in April (NRCS 2026i). From 2005–2025, average annual snowpack depth was 34.7 inches with an average SWE of 10.9 inches; April averages increased to 54.9 inches of snowpack and 17.7 inches SWE. Snowmelt generally begins in April and continues through May and early June, when SWE approaches zero and most snowmelt-driven runoff has occurred.

Temperature data from the Tonopah station reflect typical Great Basin conditions, with average monthly temperatures ranging from 32.6 degrees Fahrenheit (°F) in December to 76.3°F in July. Transitional seasons are milder, averaging 48.6°F in spring (March–May) and 52.7°F in autumn (September–November) (NOAA 2025). These seasonal patterns influence snow accumulation and melt, evapotranspiration, and the timing of streamflow in the watershed.

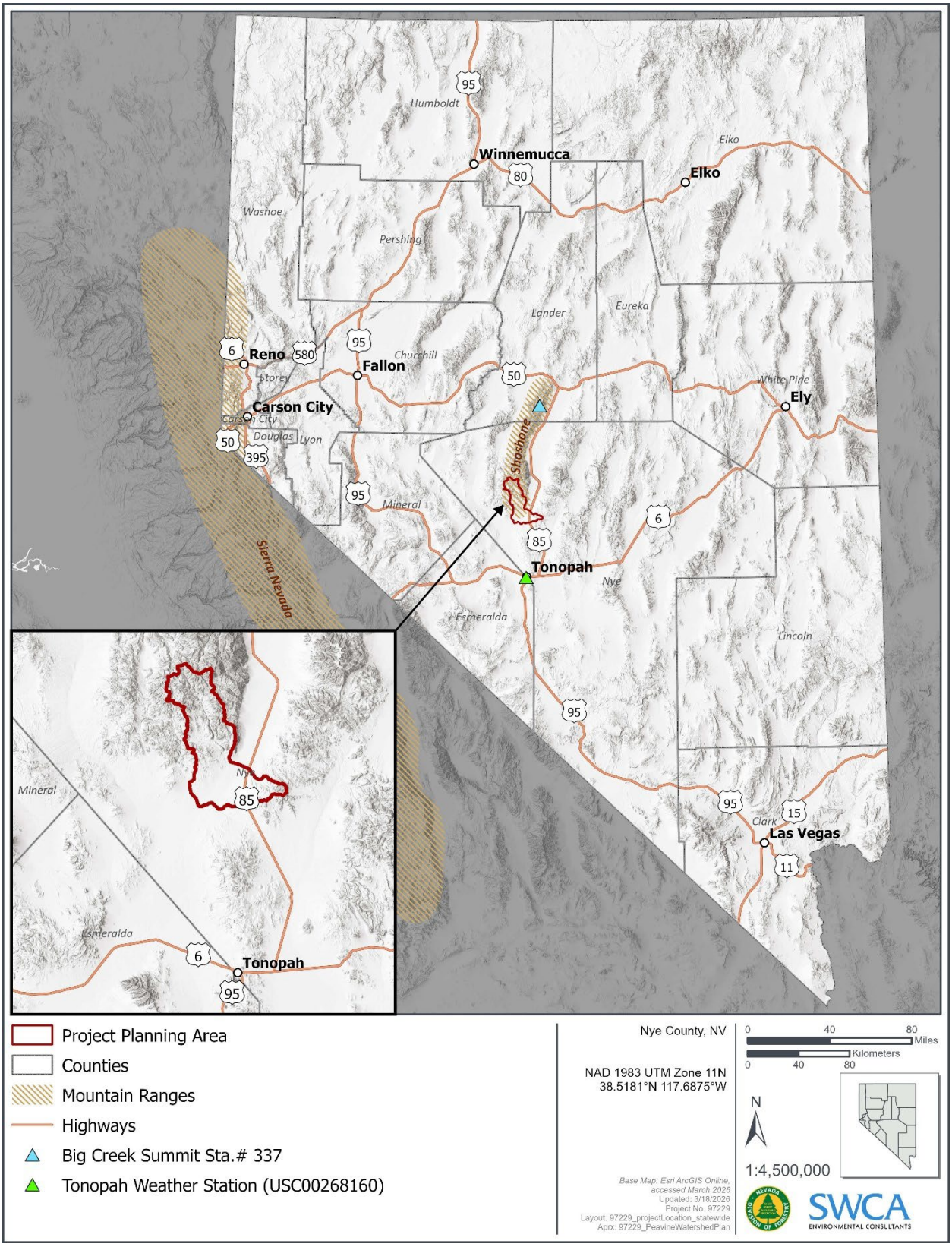


Figure 2-1. Weather stations used for climate analysis and nearby mountain ranges that influence conditions in the Peavine Creek watershed.

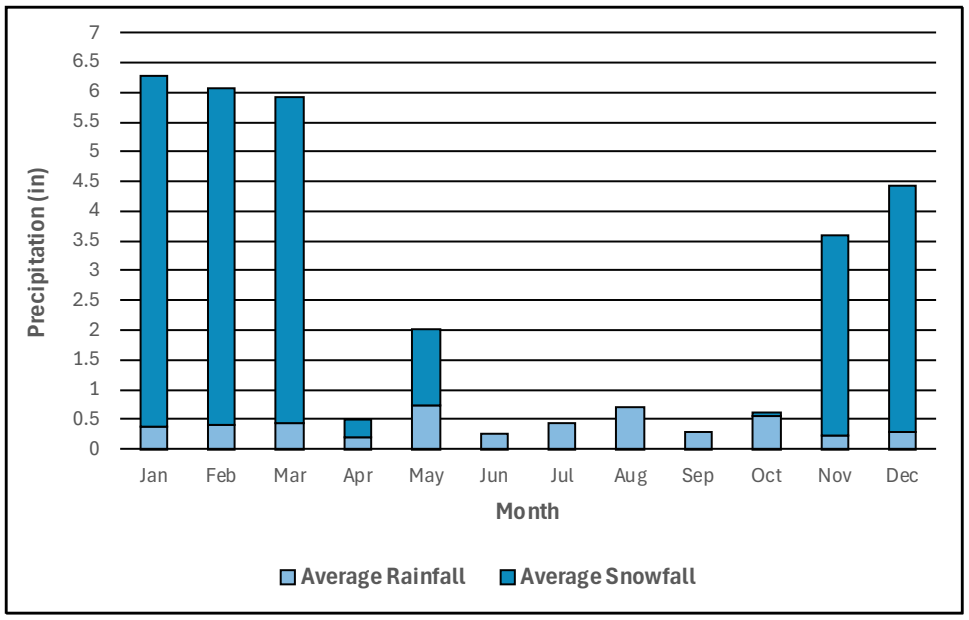


Figure 2-2. Average monthly precipitation (2015–2025) in Tonopah, Nevada (Station ID: GHCND:USC00268160) (NOAA 2025).

2.1.2 Soils

Soils and geologic characteristics influence surface water dynamics, erosion potential, and groundwater recharge within a watershed. In the Peavine Creek watershed, available soils data from the NRCS classify soils into hydrologic groups A, B, C, and D based on infiltration capacity and runoff potential (Figure 2-3). These classifications are commonly used to assess infiltration potential, watershed response, and stormwater management. However, soils data are limited to the southern portion of the planning area, primarily within Big Smoky Valley and outside USFS-managed lands (NRCS 2026h).

- Group A soils have the highest infiltration and lowest runoff potential and consist mainly of well-drained sand or gravel. They cover about 5% (5,608 acres) of the planning area and occur mainly along Peavine Creek and the eastern portion of Big Smoky Valley.
- Group B soils have moderate infiltration and are rare, covering less than 1% (767 acres) of the planning area, primarily west of the Peavine Creek main stem.
- Group C soils have moderate to slow infiltration and are the second most common mapped soils, covering about 9,000 acres (8%) mainly in foothill and upland areas west of the Toquima Range.
- Group D soils have low infiltration and high runoff potential and are the most extensive mapped soils, covering about 21,824 acres (20%), primarily across the western valley floor and parts of Big Smoky Valley and adjacent foothills.

Approximately 66% of the planning area lacks mapped soils data, largely within USFS-managed lands in the northern and southeastern portions of the watershed (Figure 2-3).

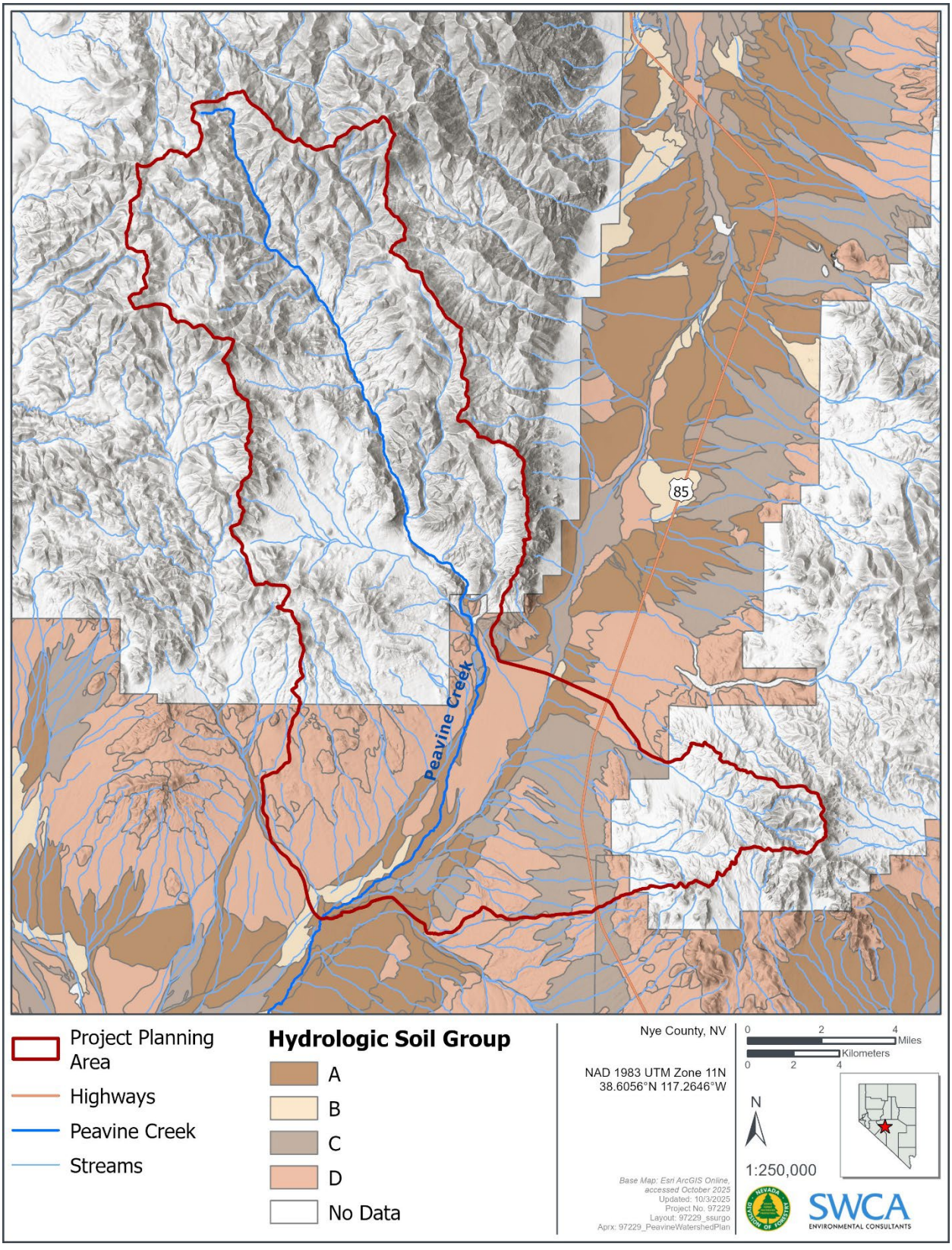


Figure 2-3. Hydrologic soil group distribution across the Peavine Creek watershed.

2.1.2.1 SOIL ERODIBILITY HAZARD

The soil survey geographic database (SSURGO) soil hazard ratings indicate how susceptible mapped soils are to specific concerns, such as erosion, flooding, or limitations for septic systems. These ratings combine measured soil properties and landscape characteristics, such as texture, slope, and permeability, into standardized classes. The ratings are based on field observations, laboratory analyses, and interpreted attributes stored in the SSURGO database (NRCS 2026h).

Within the planning area, information on soil erosion hazard is primarily available for the lower portion of the watershed in the Big Smoky Valley (Table 2-1). Soil in the northwestern portion of the planning area, including USFS-managed lands near the headwaters of Peavine Creek, are not currently rated for erosion hazard.

Erosion hazard ratings are categorized as none, slight, moderate, severe, or not rated, reflecting increasing levels of management concern and the potential need for mitigation. These categories are defined as follows (Esri 2025):

- None: Soil shows no measurable loss of the original surface horizon from water or wind erosion; no special erosion control measures are typically required.
- Slight: Minor past erosion has removed a small portion of the original topsoil; standard management practices are usually sufficient to limit further loss.
- Moderate: Noticeable topsoil loss with greater exposure of subsoil; reduced infiltration and organic matter can affect plant growth and runoff, and site-specific mitigation is often needed.
- Severe: Substantial topsoil loss or active rill or gully erosion has significantly impaired soil function and stability; extensive engineering or conservation measures are typically required.
- Not rated: Insufficient data exists to classify soil erodibility hazard.

Across the planning area (where data are available), soil erodibility varies. Slightly to moderately erodible soils account for approximately 29% of the area, while severely erodible soils make up about 5%. Areas with severe erosion hazard are primarily located in downstream portions of the watershed within the Big Smoky Valley, including a concentration along Peavine Creek south and southeast of the USFS boundary (Figure 2-4). Much of this area includes private residential properties situated on or downstream of these highly erodible soils, which may present management challenges related to erosion and water resource management.

Table 2-1. Soil Erosion Hazard Rating in the Peavine Creek Watershed

Erosion Hazard Rating	Total Acres	Percentage of Planning Area (%)
Not rated	73,756	66
Slight	10,104	9
Moderate	22,207	20
Severe	4,890	5

Source: (NRCS 2026h)

Note: Percentages are rounded to the nearest whole value.

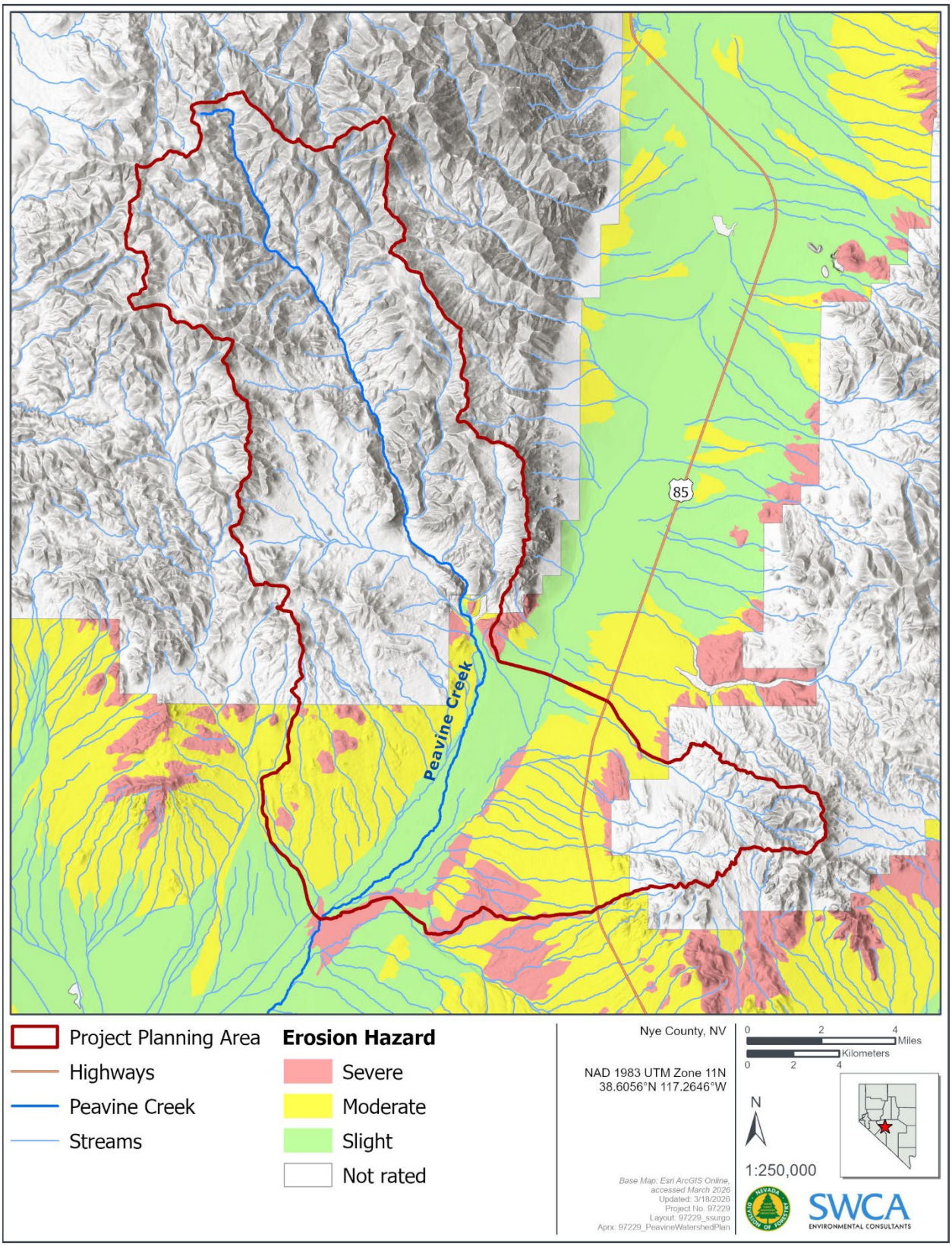


Figure 2-4. Soils with severe erosion hazard rating in the Peavine Creek watershed.

2.1.3 Fish and Wildlife

Wildlife contributes to watershed health by influencing nutrient cycling, vegetation dynamics, and soil disturbance (BLM 2018). Activities such as grazing, burrowing, nesting, and seed dispersal can affect vegetation structure, soil stability, erosion rates, and habitat conditions in both riparian and upland areas.

Numerous terrestrial and avian species—including ungulates, small and large mammals, reptiles, and birds—likely occur within the Peavine Creek watershed (NDOW 2022), though authoritative survey data are limited. Aquatic and amphibian species are also present within the Peavine Creek watershed. Species data specific to Peavine Creek are limited. As a closed basin system, the creek is largely isolated from other perennial water bodies, preventing natural fish migration. As a result, fish populations are influenced by historical introductions and watershed conditions. NDOW Biodiversity Division staff observed brook trout (*Salvelinus fontinalis*) and brown trout (*Salmo trutta*) upstream of Peavine Creek Campground in 2025; these wild populations are believed to originate from introductions several decades ago (West 2026). Recent stocking has been limited, though NDOW stocked 1,032 Rainbow trout in June 2021 and 501 in July 2024 (NDOW 2026a). Rainbow trout (*Oncorhynchus mykiss*) have been observed near the campground as recently as 2025, but the population is not considered self-sustaining (West 2026).

In Nevada, aquatic species diversity and distribution are strongly shaped by the state's geologic and hydrographic history, which has produced many endemic species adapted to isolated habitats (NDOW 2022). In total, 10 aquatic and amphibian species could potentially occur in Peavine Creek based on their regional ranges (Table 2-2). The list may not be exhaustive, and further biological surveys are needed to confirm species presence and abundance. The watershed lies within the BLM's Battle Mountain District, where 21 fish and amphibian species of concern have been identified (Table 2-3). While not all are expected to occur within the BLM district, their inclusion provides context for conservation concerns in similar ecosystems.

Table 2-2. Aquatic and Amphibian Species Possibly Found within the Peavine Creek Watershed

Species	Common Name
Rhinichthys osculus lariversi	Big Smoky Valley speckled dace
Siphateles bicolor ssp. 8	Big Smoky Valley tui chub
Rana luteiventris	Columbia spotted frog
Spea intermontane	Great Basin spadefoot
Oncorhynchus clarkii henshawi	Lahontan cutthroat trout
Anaxyrus boreas	western toad
Anodonta californiensis	California floater
*Salvelinus fontinalis**	brook trout*
*Salmo trutta**	brown trout*
*Oncorhynchus mykiss**	rainbow trout*

Source: (Buqo 2004, NDOW 2026b, NDOW 2026c)

* Species has been observed/sampled in the watershed as recently as 2025 (West 2026).

Table 2-3. Special-Status Species within BLM Battle Mountain District, Nevada

Species	Common Name	Federal Status	State Listed Status*
Anaxyrus boreas	western toad	none	SGCN; apparently secure
Anaxyrus monfontanus	Hot Creek toad	none	SGCN; critically imperiled
Anaxyrus nelsoni	Amargosa toad	none	SGCN; imperiled
Anaxyrus nevadensis	Railroad Valley toad	none	SGCN; critically imperiled
Lithobates pipiens	northern leopard frog	none	SGCN; imperiled
Rana luteiventris	Columbia spotted frog (including Toiyabe spotted frog subpopulation)	none	SGCN; Imperiled
Thermopsis thermophila	Ostracod sp.	none	N/A
Crenichthys nevadae	Railroad Valley springfish	threatened, critical habitat	SGCN; critically imperiled
Moapa coriacea	Moapa dace	endangered	SGCN; critically imperiled
Oncorhynchus clarkii henshawi	Lahontan cutthroat trout	threatened	SGCN; imperiled
Rhinichthys osculus lariversi	Big Smoky Valley speckled dace	none	SGCN; critically imperiled
Rhinichthys osculus ssp. 5	Monitor Valley speckled dace	none	SGCN
Rhinichthys osculus ssp. 10	Diamond Valley speckled dace	none	possibly extirpated
Siphateles bicolor euchila	Fish Creek Springs tui chub	none	SGCN; critically imperiled
Siphateles bicolor ssp.	Butterfield Spring tui chub	none	N/A
Siphateles bicolor ssp. 10	Charnock Ranch tui chub (Charnock Springs tui chub)	none	critically imperiled
*Siphateles bicol*or ssp. 4	Fish Lake Valley tui chub	none	SGCN; critically imperiled
Siphateles bicolor ssp. 5	Hot Creek Valley tui chub	none	critically imperiled
Siphateles bicolor ssp. 6	Little Fish Lake Valley tui chub	none	SGCN; critically imperiled
Siphateles bicolor ssp. 7	Railroad Valley tui chub	none	SGCN; critically imperiled
Siphateles bicolor ssp. 8	Big Smoky Valley tui chub	none	SGCN; critically imperiled
Coccyzus americanus	yellow-billed cuckoo	threatened	SGCN; apparently secure
Danaus plexippus	Monarch butterfly	candidate, proposed threatened	SGCN; secure

Source: (BLM 2023, U.S. Fish and Wildlife Service 2026)

* SGCN: species of greatest conservation need

2.1.4 Vegetation and Land Cover

Vegetation and land cover vary across the planning area, which contains four distinct Level IV ecoregions (Table 2-4) (EPA 2026b). Level IV ecoregions group areas with similar soils, geology, climate, vegetation, and topography, providing context for watershed planning by helping interpret hydrology, erosion potential, channel morphology, vegetation communities, and likely sources of nonpoint pollution (Figures 2-5 and 2-6).

Table 2-4. Project Area Level IV Ecoregions

Ecoregion Name	Ecoregion Code	Total Acreage within the Planning Area (acres)	Percentage of the Planning area (%)
Central Nevada Bald Mountains	13t	15,773	14.22
Central Nevada Mid-Slope Woodland and Brushland	13s	31,622	28.50
Central Nevada High Valleys	13r	25,508	22.99
Tonopah Basin	13u	38,053	34.30

(Source: EPA 2026b)

Higher elevations in the northwestern and southeastern portions of the watershed are dominated by evergreen forest, representing about 32.4% of total land cover (U.S. Geological Survey [USGS] 2018). Shrub and scrub vegetation dominate foothill, upland, and valley floor areas, accounting for approximately 66% (USGS 2018). Development is minimal; low- and medium-density development and developed open space make up about 1.3% of the planning area (USGS 2018). Agricultural land use is also limited, composing roughly 0.22% of the watershed, primarily irrigated pasture/hay production and cattle grazing in the lower western portion near Peavine Creek (USGS 2018). Although limited in extent, agricultural activities near waterways can contribute to sediment and nutrient loading through irrigation or stormwater runoff and through livestock access to riparian areas, which may lead to soil compaction, habitat degradation, and increased nutrient or biological inputs.

Vegetation patterns may not always align with those typically associated with each ecoregion, as land use, hydromodification, and climatic variability can also influence plant communities. Both invasive species and excessive growth of native vegetation can affect riparian ecosystem structure and watershed function. Dense vegetation may reduce plant diversity, alter wildlife habitat, and influence hydrologic processes by increasing evapotranspiration and water use (BLM 2018). It can also affect sediment transport and channel dynamics by stabilizing banks, trapping sediment, and increasing hydraulic resistance, potentially contributing to channel narrowing or altered flow patterns (Martin and Johnson 1987; Malanson 1993).

Within the Peavine Creek watershed, stakeholders and land managers have identified areas of dense riparian vegetation dominated by willow (*Salix* spp.), as well as invasive tamarisk (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*) in the lower watershed. Dense riparian vegetation (Figure 2-7) may influence water conveyance and channel morphology in parts of the corridor, potentially affecting water availability for downstream users. While willows provide important ecological benefits such as bank stabilization, shading, and habitat, excessive density may alter channel form and sediment storage under certain conditions. Further assessment of willow stands and invasive species distribution will help clarify their hydrologic and geomorphic effects and inform vegetation management actions described in Section 4.1.

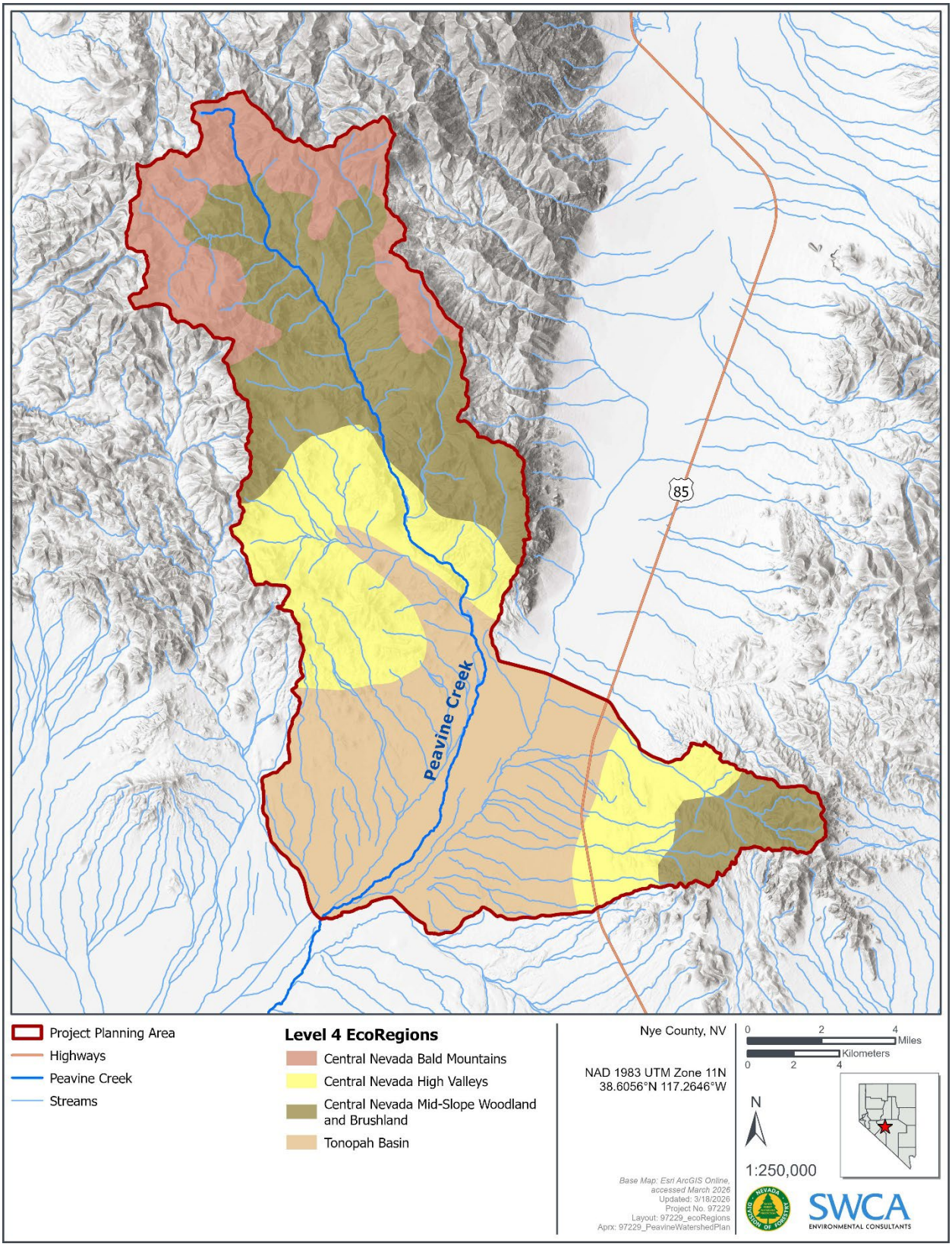


Figure 2-5. Distribution of Level IV ecoregions within the planning area.

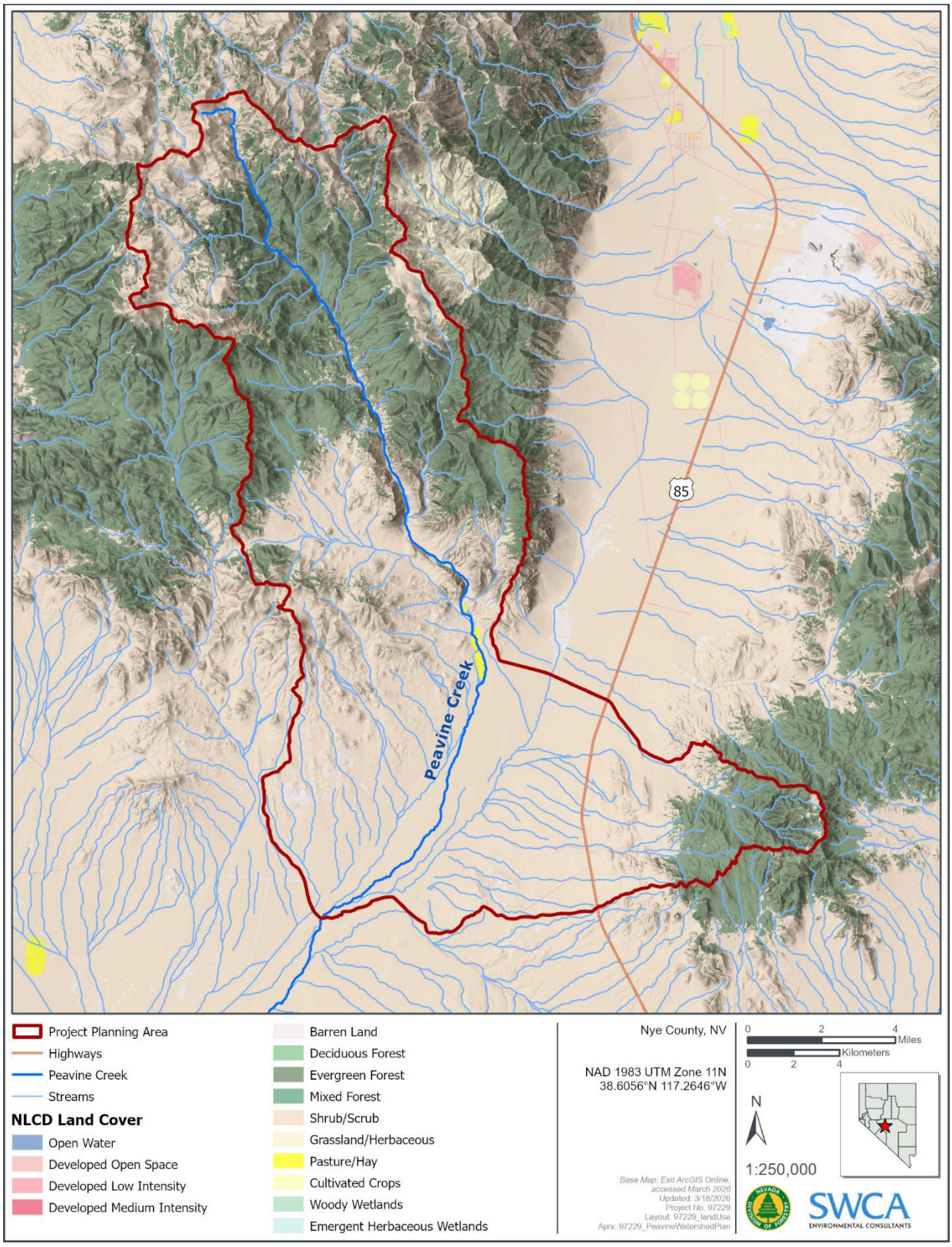


Figure 2-6. Land cover extent by type within the planning area.

Figure 2-7. Dense riparian vegetation along Peavine Creek.

2.2 Social and Human Features

2.2.1 Land Use and Landownership

The majority of land within the project area is federally managed (Figure 2-8). The USFS manages approximately 66% of the project area (73,039 acres), including the northwestern portion from the Peavine Creek headwaters to the USFS boundary, as well as the southeastern portion near the southern end of the Toquima Mountain Range (USGS 2018). Recreation is the primary land use on USFS lands, including activities such as hiking, fishing, hunting, and off-highway vehicle (OHV) use. Further details on recreational uses are provided in Section 2.2.3. The BLM manages about 33% of the watershed (36,673 acres), primarily in the southern part of the Peavine Creek watershed within the Big Smoky Valley (USGS 2018). Cattle grazing is prevalent and represents the predominant land use on BLM-managed lands.

Private ownership is limited, accounting for only 1.1% (1,245 acres) of the watershed (USGS 2018). Private lands are mainly concentrated along Peavine Creek just below the USFS boundary and extend into the foothills and uplands above Big Smoky Valley, with a secondary cluster near the southern boundary of the planning area, east of Peavine Creek. Land use on private parcels is primarily small-scale farming, with residents raising livestock such as horses and cattle.

Figure 2-8. Landownership in the region.

2.2.2 Population

The population within the Peavine Creek watershed is minimal, with less than 20 total residents (eight property owners), with approximately 25% permanently residing year-round. Residents are interspersed throughout the private land tracts that span the planning area below the Peavine Creek Campground (see Figure 2-8).

2.2.3 Recreation

Recreation in the Peavine Creek watershed is primarily managed by the Humboldt–Toiyabe National Forest (Austin–Tonopah Ranger District), with public access concentrated around Peavine Creek Campground and nearby backcountry areas near the Arc Dome Wilderness (see Figure 2-8) (USFS 2025a). Land-based recreation is the primary use and includes hiking, camping, horseback riding, hunting, OHV use, and wildlife viewing. Camping is limited to about 15 sites at the Peavine Creek Campground, with additional dispersed camping allowed under national forest regulations (USFS 2025a). Water-based recreation is limited because Peavine Creek is generally small, though its riparian corridor and perennial pools support occasional fishing for stocked trout during higher flow periods.

The campground operates from May through October, corresponding with snow-free access and the main tourism season in central Nevada's high elevations (6,000–9,000 feet). Peak recreation occurs from mid-May through early October.

Visitor data specific to Peavine Creek are limited due to the absence of entry stations or consistent surveys. In 2005, the Humboldt–Toiyabe National Forest received approximately 2.29–2.34 million visitors overall (USFS 2025b), though Peavine Creek likely represents only a small share due to its remote location and limited facilities. Informal campground estimates suggest roughly 20–50 visitors per week during peak season (June–September) (Campendium 2025; The Dyrt 2025), with additional day use from nearby communities such as Tonopah.

2.3 Water Resources

All water resources in the planning area and across Nye County originate from precipitation within the county or nearby groundwater recharge areas (Buqo 2004). Surface and groundwater resources are used for irrigation, domestic supply, livestock watering, and recreation. Because the Peavine Creek watershed lies in an arid to semiarid region, water availability is limited, making careful monitoring of water quantity and quality important for sustainable use and watershed health.

2.3.1 Surface Water Resources

Peavine Creek is the primary surface water feature in the planning area. It originates near the Arc Dome Wilderness and flows southeast through Peavine Canyon toward the Big Smoky Valley. About 3,200 feet upstream of its confluence with Tom's Canyon (approximately 6,760 feet elevation), the creek transitions from perennial to ephemeral flow. After entering the Big Smoky Valley, it flows generally south to southwest toward a terminus northwest of Tonopah, though flows typically do not reach this endpoint.

The creek spans an elevation drop of roughly 4,150 feet, from about 9,000 feet at its headwaters to approximately 4,850 feet near its terminus. Along its course, Peavine Creek receives runoff from several ephemeral and intermittent tributaries. Montane washes in the Toiyabe Range to the west contribute precipitation and snowmelt runoff, while additional tributaries originate from the southern Toquima Range along the eastern portion of the planning area.

Wetlands within the planning area are primarily located where the creek exits the Toiyabe Range and enters the Big Smoky Valley, as well as east of the creek where tributaries from the Toquima Range enter the valley. Approximately 334 acres of emergent wetlands and 229 acres of forested or shrub wetlands occur within the watershed, along with about 1,679 acres classified as riverine wetlands according to the National Wetland Inventory (Figure 2-9). A continuous riparian corridor follows Peavine Creek from its headwaters downstream to the foothills above the Big Smoky Valley. Riparian vegetation density declines across the valley floor and becomes difficult to identify in aerial imagery downstream of Kelley Lane.

Stakeholder observations indicate that perennial flow typically continues until the creek reaches the Big Smoky Valley just downstream of private land tracts shown in Figure 2-8. In the valley, flows in the normally ephemeral reaches are generally observed only during spring runoff or major storm events.

Water use data specific to the watershed are limited. Private landowners rely on groundwater wells rather than direct withdrawals from Peavine Creek for domestic supply, though several diversions along the creek support irrigation (see Section 2.3.3). Domestic wells range from 40 to 408 feet deep, with an average depth of about 160 feet (Nevada Division of Water Resources [NDWR] 2026). Static water levels recorded at the time of well construction range from 6 to 106 feet below ground surface, averaging about 60.5 feet (NDWR 2026). Because some wells date back to the early 1990s, these measurements may not reflect current groundwater conditions.

There are no lakes or reservoirs within the planning area. National Hydrologic Dataset mapping identifies Seyer Reservoir north of the watershed (see Figure 2-9); however, aerial imagery suggests it typically exists as a dry lakebed or playa, with established upland vegetation across much of the basin.

Nye County contains significant groundwater resources that support municipal, agricultural, mining, and other uses (Buqo 2004). The Peavine Creek planning area lies within the Big Smoky Valley–Tonopah Flat Hydrographic Basin [137(A)], part of the South Central Marshes regional groundwater flow system (Buqo 2004). In these systems, groundwater can move between adjacent hydrographic basins through connected aquifers.

Groundwater in the basin primarily occurs in basin-fill aquifers that comprise unconsolidated sediments such as sand, gravel, silt, and clay that accumulate in Basin and Range valleys (Figure 2-10). These deposits are often underlain by fractured carbonate rock aquifers that form a regionally extensive system capable of transmitting groundwater between basins (Buqo 2004; Harrill and Prudic 1998). Recharge occurs mainly from precipitation and snowmelt above about 6,000 feet, mountain runoff, and regional inflow through the carbonate aquifer system, with much of the recharge originating in the surrounding Toiyabe and Toquima ranges (Buqo 2004).

2.3.2 Groundwater Resources

Groundwater availability in Nye County is difficult to estimate because many hydrographic basins extend across county boundaries. The South Central Marshes flow system, including the Tonopah Flat Basin, extends into neighboring Esmeralda County, requiring coordinated management across jurisdictions (Buqo 2004). A recent basin status assessment by the NDWR found groundwater levels in the Tonopah Flat Basin declined moderately (0.31–0.90 feet per year) between 1984 and 2021 (NDWR 2023), suggesting pumping may exceed recharge in some areas. Groundwater rights commitments exceed estimated perennial yield by approximately 250% to 350%, although actual pumping is estimated to be closer to 100% to 120% of perennial yield (NDWR 2023). Understanding this groundwater budget is important for maintaining watershed health and long-term water availability.

The Peavine Creek watershed does not have a centralized municipal water system. Domestic water use is supplied through private groundwater wells. Within the planning area, 11 domestic wells are present, including seven located along the main stem of Peavine Creek upstream of the Big Smoky Valley and four within the valley near ephemeral reaches of the creek (NDWR 2026). In addition, two stock wells and two irrigation wells occur within the watershed (NDWR 2026).

2.3.3 Water Diversions

Surface water from Peavine Creek and its tributaries is diverted for several uses within the watershed, primarily stock watering and irrigation (Figure 2-11). The largest diversions occur along lower Peavine Creek downstream of the campground, where water is used to irrigate hay and pasture on adjacent private lands.

Available records identify 11 diversions along the main stem of Peavine Creek; nine are permitted for irrigation and two for recreation (Table 2-5). In addition, 14 stock-water diversions occur along tributaries and washes west and southwest of the creek, and four additional stock-water diversions occur east and northeast of Peavine Creek, mainly along Horse Creek, a tributary to Peavine Creek.

The application duty balance represents the maximum permitted annual diversion but does not reflect actual withdrawal volumes in a given year. More comprehensive monitoring will be needed to develop an accurate watershed water budget.

Stakeholders and land managers also report that additional, unmapped diversions may exist. Future implementation efforts may include identifying and mapping these features to improve understanding of water use and surface water dynamics in the watershed and to support more informed watershed management.

Table 2-5. Peavine Creek Main Stem Diversion Water Rights

Diversion Use	Average Application Duty Balance (acre-feet/year)	Average Application Diversion Rate Balance (acre-feet)	Diversion Count along Peavine Creek
Irrigation	402.20	1.21	8
Recreation	0.35	0.12	2
Stock water	0	0.20	1

Source: NDWR 2026

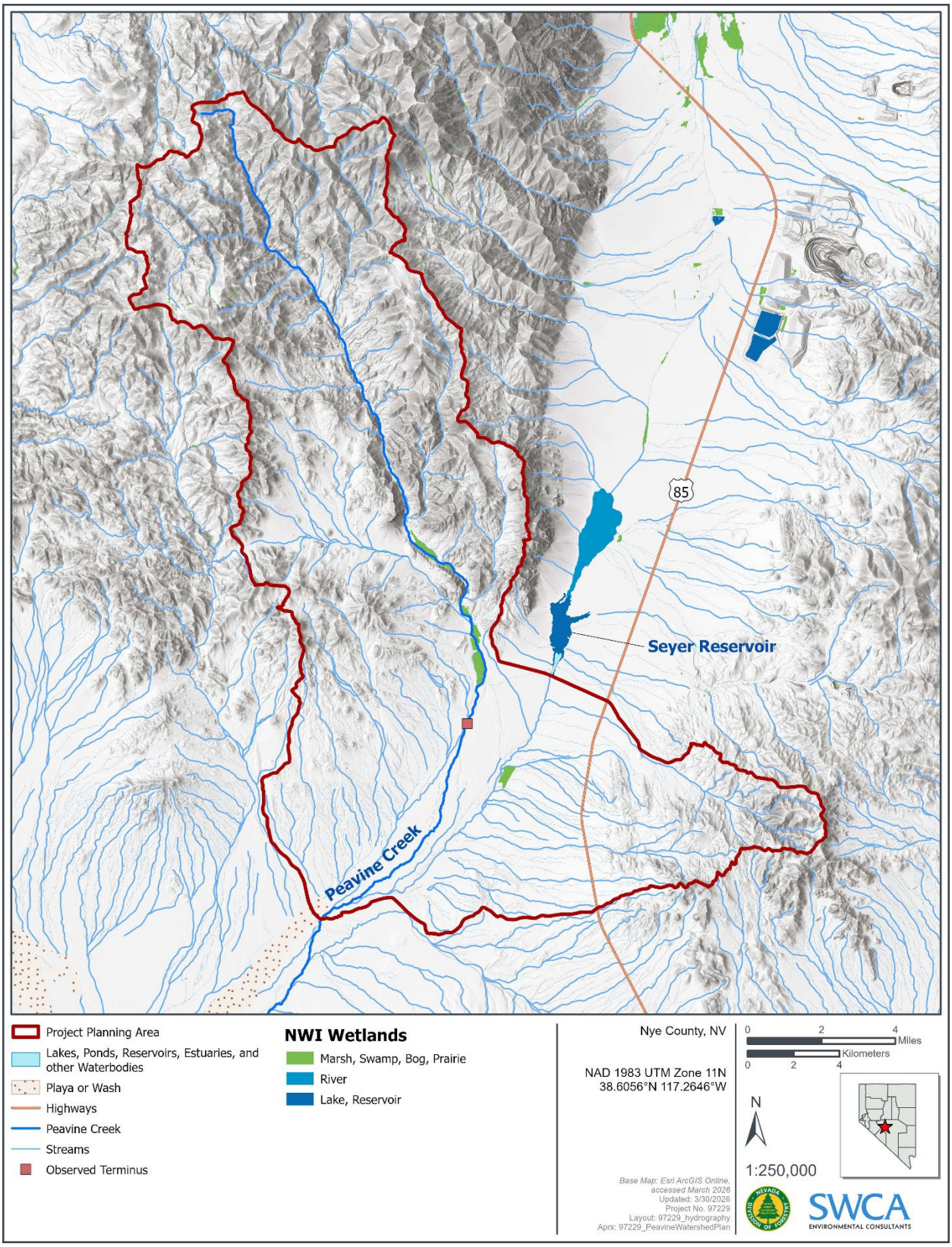


Figure 2-9. Surface water resources within and surrounding the project area.

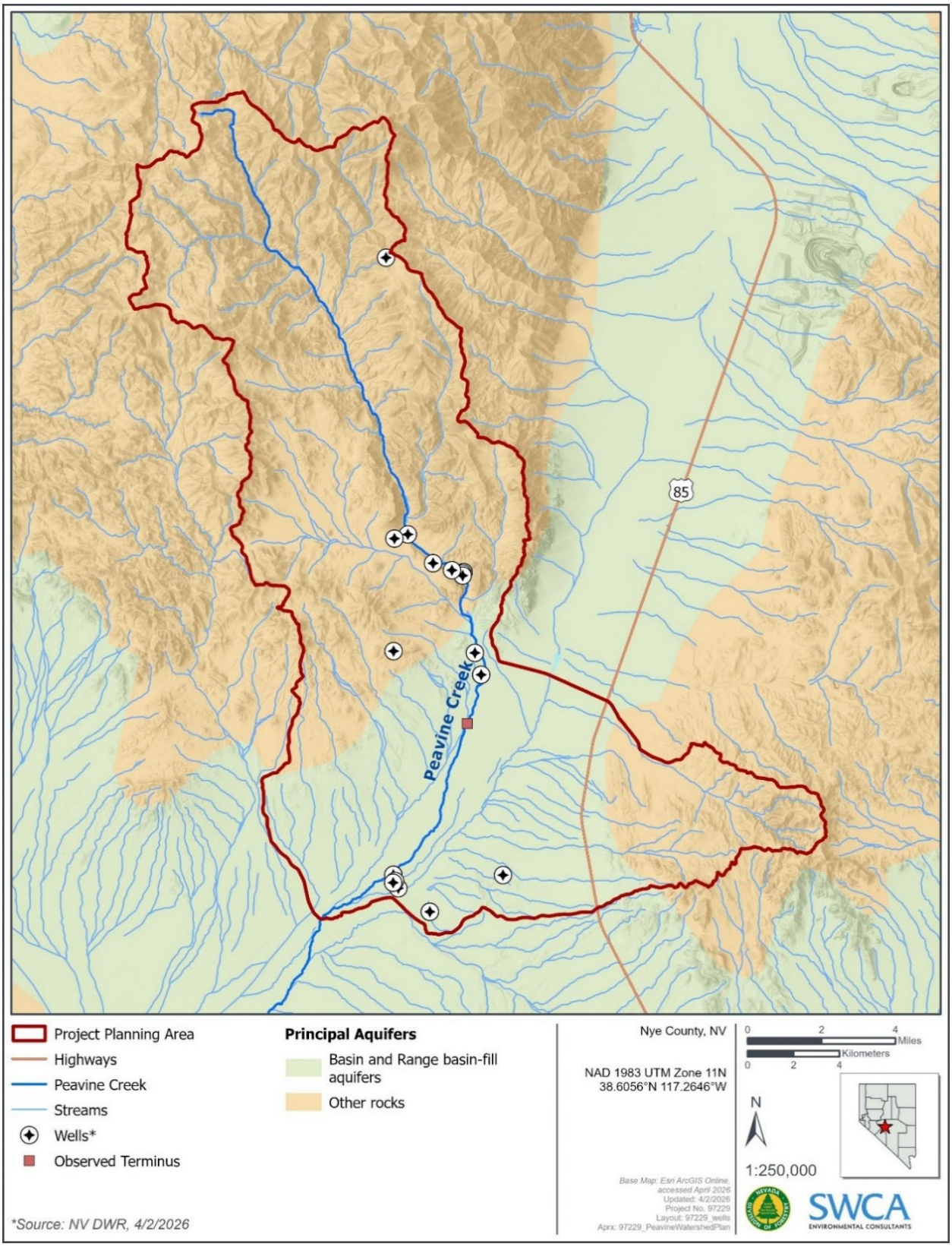


Figure 2-10. Principal aquifers and groundwater wells within the Peavine Creek watershed (NDWR 2026).

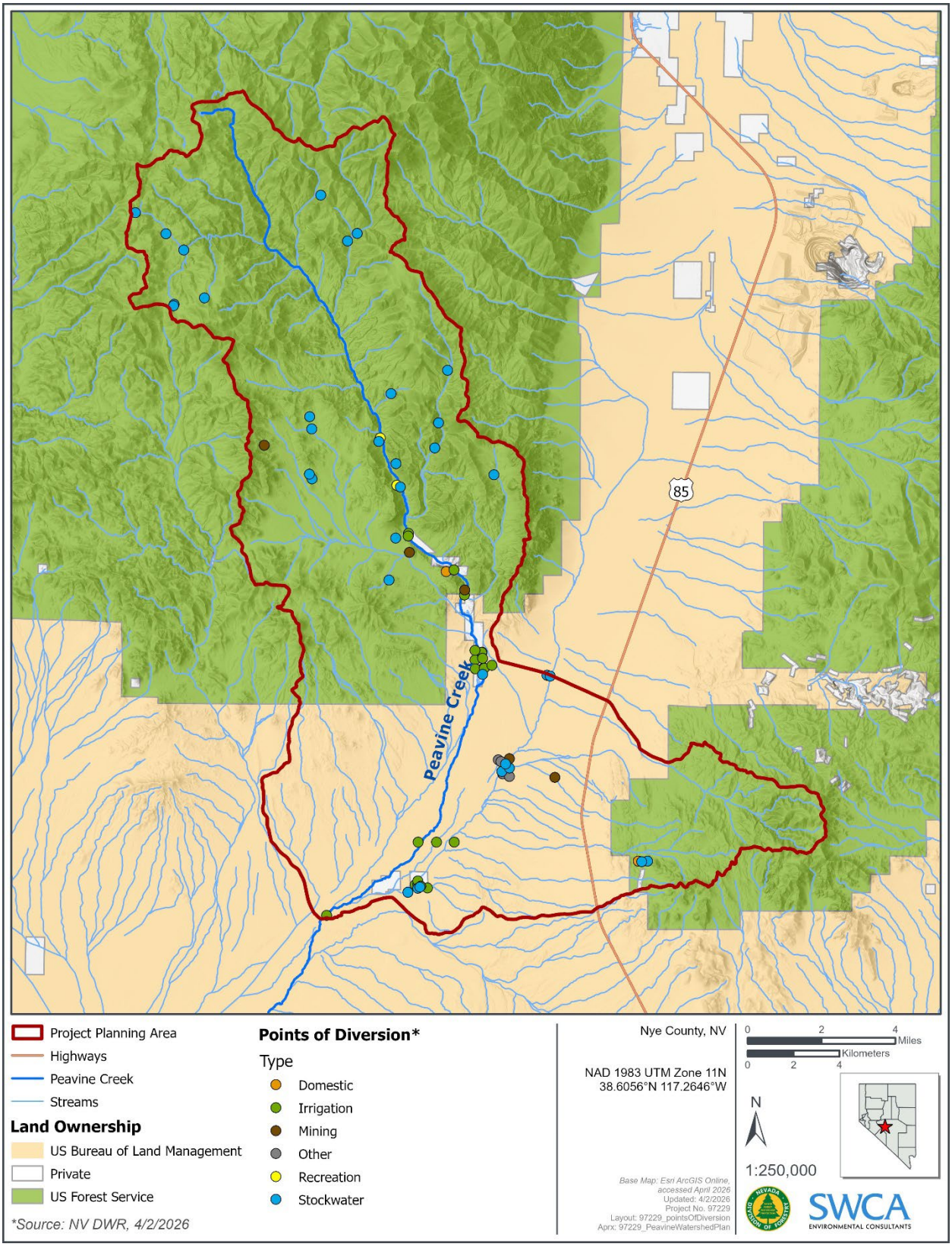


Figure 2-11. Points of diversion within the Peavine Creek watershed (NDWR 2026).

3 WATER QUALITY AND POLLUTION SOURCES

This section provides an overview of water quality concerns in the Peavine Creek watershed by:

- Evaluating possible water quality concerns affecting the Peavine Creek watershed (Section 3.1).
- Discussing the causes and sources of pollution (Section 3.2).
- Analyzing spatial and temporal trends using available water quality data (Section 3.3).
- Inventory of data gaps identified through data inventory and analysis (Section 3.4).
- Providing estimates of pollutant loads from the EPA Pollutant Load Estimation Tool (PLET) model to protect Peavine Creek beneficial uses (Sections 3.5).

This analysis is based on a review of limited existing information; no new water quality data were collected for the Peavine Creek WBP.

3.1 Water Quality Concerns

The NDEP implements most CWA programs in Nevada and evaluates surface water conditions every two years through the CWA integrated reporting system. Under the CWA, states must assess surface waters, designate beneficial uses, and establish numeric and narrative water quality criteria to protect human and environmental health. In Nevada, these standards are defined in Nevada Administrative Code (NAC) 445A.

Surface waters are evaluated by comparing pollutant concentrations to applicable criteria and assigning an assessment category (1–5). NDEP also designates beneficial uses for each assessment unit (AU), which represents a specific water body or segment. Peavine Creek is identified as AU NV10 CE 07 A_00 within Region 10 – Central (NDEP 2025a). Surface waters that fail to meet criteria for designated uses are listed as impaired on Nevada's 303(d) list (Category 5), which prioritizes them for further analysis and development of restoration plans such as total maximum daily loads (TMDLs).

Peavine Creek is protected for the following beneficial uses:

- Watering of livestock
- Irrigation
- Aquatic life
- Contact recreation
- Noncontact recreation
- Municipal/domestic water supply
- Wildlife

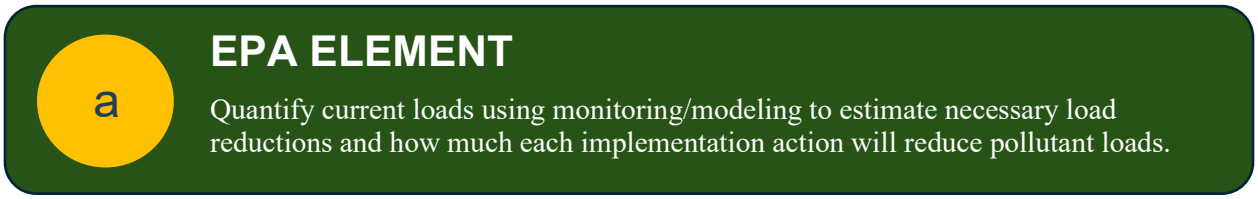
NDEP assesses and reports on the condition of surface waters in Nevada every 2 years in the Integrated Report using the following five EPA-defined categories:

- **Fully Supporting (1):** All beneficial uses assessed and meeting water quality standards.
- **No Evidence of Impairment (2):** Some beneficial uses assessed and meeting water quality standards.

- **Insufficient Data (3):** Not enough data to determine beneficial use support.
- **TMDL-Approved (4A):** Impaired but with an EPA-approved TMDL(s).
- **Not Supporting (5):** Pollutant levels exceed water quality criteria.

According to the 2024 Integrated Report, Peavine Creek is classified as Category 3 (Insufficient Data) (NDEP 2025b). NDEP typically requires at least eight samples per parameter to assess beneficial use support, and current monitoring data are insufficient to determine whether the creek is fully supporting or impaired. As a result, this WBP is developed as a protective plan.

3.2 Causes and Sources of Pollution



As part of the EPA Nine-Element watershed planning process, plans must identify sources of pollution (Element a) (see Section 1.2 for all nine elements). Pollution in aquatic environments results from a combination of natural processes and human activities that introduce pollutants into water bodies. Common sources of pollution include nonpoint sources, such as runoff from agricultural lands, and recreational sites, which can carry nutrients, sediments, and contaminants into rivers and lakes. Additional nonpoint sources include natural inputs like erosion or geological weathering, and atmospheric deposition, which can contribute minerals, salts, metals, and sediments or organic matter and nutrients from vegetation and wildlife waste. Point sources, like wastewater treatment plants or industrial discharges, contribute pollutants to waterways more directly through defined outfalls.

In Nevada, point sources of pollution are regulated by the Bureau of Water Pollution Control who issues individual, general, or temporary permits for discharge to surface waters. Nonpoint sources are not regulated by the Bureau of Water Pollution Control and are instead managed through voluntary, incentive-based, and grant-supported programs such as the Nonpoint Source Pollution Management Program responsible for distributing CWA 319(h) funds.

A review of available regulatory databases, discharge permits, and watershed planning resources did not identify any permitted point-source discharges within the Peavine Creek watershed. Based on this evaluation, no regulated point sources of pollution are currently known to occur within the watershed boundary. As a result, water quality concerns in the watershed are expected to be primarily associated with nonpoint source processes, such as stormwater runoff, erosion, and land use and human-related inputs.

3.2.1 Nonpoint Sources

Nonpoint source pollution originates from diffuse sources across a watershed rather than from a single, identifiable discharge point. These pollutants typically enter water bodies through surface runoff from rainfall or snowmelt, or through direct deposition into streams. Nonpoint source pollution can be difficult to manage because identifying all contributing sources of a contaminant is often challenging. In many cases, one stressor may also contribute to or amplify another, making it difficult to isolate the specific causes of pollutant loading. Effective management of nonpoint sources is therefore critical to maintaining

watershed health and function. The following sections describe the extent of nonpoint sources within the watershed and their potential impacts (Table 3-1).

Table 3-1. Sources and Impacts of Common Nonpoint Source Pollutants

Pollutant	Nonpoint Source(s)	Impact to Water Quality
E. coli	Human/pet waste, wildlife, and livestock	Elevated bacterial levels, health risks, recreational use impairment
DO	Organic matter and biological oxygen demand from leaf litter, livestock, human/pet waste. Channel morphology, water withdrawals, riparian vegetation, water quantity	Increased microbial respiration reduces DO, causing stress or death to aquatic life
Temperature	Channel morphology, water withdrawals, riparian vegetation, water quantity	Raises stream temperature; decreases DO solubility, stresses aquatic ecosystem and species
Metals	Natural background, legacy mining	Aquatic life toxicity; bioaccumulation concerns
Sediment	Erosion, roadways and trails, agriculture, land disturbing activities, recreation	Alters water clarity and conductivity, nutrient loading, temperature changes, impacts to aquatic life, decreased primary production
Nutrients	Natural background, wildlife, human/pet waste	Eutrophication; algal blooms; further oxygen depletion; riparian vegetation overgrowth
Total dissolved solids	Roadways and trails, stream channel instability, reduced vegetative cover	Alters water clarity and conductivity; affects aquatic habitat quality and drinking water treatment processes

3.2.1.1 HYDROLOGIC MODIFICATION

Hydrologic modification (hydromodification) can substantially alter both water quantity and water quality, particularly in semiarid and arid landscapes where natural base flows are limited and evapotranspiration rates are high. The effects of hydromodification, particularly those leading to lower flows and water scarcity, promote spatially homogeneous channels leading to a decrease in overall system health and function (Sabater and Tackner 2009). Diversions and withdrawals reduce instream discharge, which decreases dilution capacity, increases residence time, and can elevate stream temperatures which impact aquatic wildlife and degrade aquatic and riparian habitats (Poole and Berman 2001; Rolls et al. 2012). Although a portion of withdrawn water is eventually returned to the local hydrologic system, it is typically a proportionally low return volume (Poole and Berman 2001). In water-limited systems, reduced flow also alters sediment transport, channel morphology, and floodplain connectivity, contributing to ecological degradation (Nilsson and Renöfält 2008; Sabater and Tockner 2009). Semiarid watersheds, such as the Peavine Creek watershed, are especially sensitive because a large proportion of annual discharge may occur during short-duration runoff events, and summer base flows are often sustained by groundwater inputs that are vulnerable to diversion and consumptive use. Assessments of western United States water use consistently identify irrigation as the dominant consumptive use of surface water in arid states, with measurable reductions in downstream flow and altered seasonal hydrographs (Deiter et al. 2018). In Nevada, irrigation accounted for the largest category of consumptive use of both surface and ground water resources (Deiter et al. 2018).

The November 13, 2025, watershed tour confirmed the presence of multiple canals and surface water diversions within the Peavine Creek watershed, primarily used for irrigation and stock watering. Available hydrologic data indicate that there are 29 unique points of diversion across the watershed, 18 of which are used for stock watering, nine for irrigation, and two for recreation (NDWR 2026) (see Section 3.3.3 for additional details). Of those 29, only 12 are along the main stem of Peavine Creek. Due to the uncertainty about the extent and impact of diversions within the watershed, the identification and mapping of each canal and diversion structure will be necessary to develop a monitoring plan with the

aim of quantifying changes in water quantity, evaluating alterations to the hydrologic regime, and assessing potential downstream effects on aquatic resources and attainment of beneficial uses.

3.2.1.2 STREAM EROSION AND STABILITY

Streambank erosion and channel instability are natural geomorphic processes; however, when accelerated by altered hydrology, land-use disturbance, vegetation loss, or channel modification, they can become significant sources of water-quality impairment. Eroding streambanks contribute sediment, nutrients, and other sediment-bound contaminants to surface waters, increasing turbidity and degrading aquatic habitat and riparian conditions (Gellis et al. 2024). Excess fine sediment is widely recognized as a leading cause of stream impairment because it reduces light penetration, alters streambed substrate, and negatively affects aquatic organisms and ecosystem productivity (Gellis et al. 2024).

Channel instability may also result from increased runoff energy, loss of riparian vegetation, or other disturbances that reduce bank resistance and allow flowing water to erode and undercut streambanks (EPA 2003). In some watersheds, channel incision and the downward erosion and deepening of a streambed can generate a large portion of total sediment yield and disrupt hydrologic connectivity between the stream and its floodplain, further exacerbating erosion and sediment transport.

Within the Peavine Creek watershed, observations from NDF staff and local stakeholders suggest that some stream reaches may exhibit signs of channel instability or incision (Figure 3-1). In particular, Dry Wash and the reach of Peavine Creek downstream of its confluence with Dry Wash have been identified as sources of high-velocity runoff during precipitation events and spring snowmelt (personal communication, local stakeholders 2026). During the watershed tour on November 13, 2025, stakeholders indicated the flows from this area have reportedly damaged water control infrastructure and affected downstream stream reaches on private parcels. However, quantitative geomorphic data for the watershed are currently limited, which constrains the ability to plan and implement targeted actions to address stream erosion.

Figure 3-1. Channel instability/incision within the main stem of Peavine Creek.

Stakeholders and local land managers have expressed concerns about the increasing homogenization of vegetation within the riparian corridor (Figure 3-2), driven by the overgrowth of willows and the presence of invasive species such as tamarisk and Russian olive. Reduced diversity or uneven distribution of riparian vegetation can affect stream channel stability by limiting the variety of root structures that help stabilize streambanks and floodplains (BLM 2018). Riparian vegetation plays an important role in trapping sediment, reinforcing banks, and dissipating stream energy during high flows. When vegetation becomes sparse, overly uniform, or dominated by invasive species, these stabilizing functions may be diminished (BLM 2018).

Changes in vegetation composition and density can therefore influence sediment storage and transport along stream channels and adjacent floodplains (BLM 2018). Simplified or degraded riparian plant communities may contribute to increased bank erosion and reduce the ability of riparian areas to maintain stable channel conditions. As part of the watershed monitoring strategy, future implementation efforts may include a stream stability assessment to evaluate channel conditions, identify erosion-prone reaches, and inform targeted restoration or stabilization actions where appropriate.

Figure 3-2. Riparian vegetation assemblage along the main stem of Peavine Creek.

3.2.1.3 AGRICULTURE AND LIVESTOCK

Livestock grazing can impair watershed health and function through physical disturbance of riparian zones and direct inputs to streams, especially in arid and semiarid ecosystems where water resources and riparian vegetation can be scarce. Cattle grazing reduces riparian vegetation, destabilizes streambanks through trampling, increases erosion and sediment delivery, can widen channels via vegetation removal, and elevates stream temperatures due to reduced shading (Belsky et al. 1999). These changes degrade aquatic and riparian habitat and alter hydrologic function by reducing bank stability and modifying channel morphology. Cattle grazing, especially when done within riparian corridors, can also increase nutrient and bacteriological contamination in riverine systems during storm surges that wash fecal matter from across the watershed into waterways (Mosley et al. 1999).

Livestock also influences water quantity and flow dynamics by compacting soils and reducing infiltration, which can increase surface runoff and sediment transport (Belsky et al. 1999). However, mitigation efforts demonstrate measurable improvements. The implementation of grazing best management practices (BMPs), such as controlled stocking rates and improved grazing systems, was associated with improved stream water quality indicators in semiarid rangelands (Mosley et al. 1999).

Livestock grazing occurs within the Peavine Creek watershed, primarily on BLM-managed lands in the lower portions of the watershed and on some private parcels. Currently, water quality data are not available for areas directly influenced by grazing or for downstream reaches, so the potential effects of livestock grazing on water quality in the watershed are not well understood.

Although the area of Peavine Creek directly adjacent to grazing lands appears to be relatively small (estimated at less than 1% of the watershed), the cumulative effects across the watershed remain uncertain. Livestock with access to streams, riparian corridors, or irrigation canals can influence water

quality and riparian conditions; however, additional monitoring and assessment would be needed to better understand the extent of these interactions in the Peavine Creek watershed. Improved information on livestock use and associated watershed conditions would help to inform the selection of appropriate management measures to support long-term watershed health. Management measures for agricultural areas are outlined in Section 4.1.

3.2.1.4 BIOLOGICAL INTEGRITY

Riparian vegetation plays a major role in regulating water availability in arid and semiarid watersheds of the western United States, including Nevada. Many riparian plants, including willow, tamarisk, and Russian olive are phreatophytic species that rely on shallow groundwater and surface water for growth. Studies conducted in western river corridors demonstrate that evapotranspiration (ET) from riparian vegetation is a significant driver of watershed water loss and that vegetation density and canopy cover are primary controls on consumptive water use, often more influential than species identity alone (Nagler et al. 2013; Nichols 2000). Consequently, overgrowth of native vegetation, such as willow, can substantially increase ET and reduce the amount of water available for downstream users and ecological functions (Marttila et al. 2018). Riparian vegetation management, including thinning or restoration of natural disturbance regimes, may be necessary in some watersheds to maintain balanced riparian structure and water availability where vegetation density has increased beyond historic conditions.

Changes in water quantity associated with excessive riparian vegetation have important implications for water quality. In arid and semiarid basins vegetation uptake and ET removes water while leaving dissolved salts, nutrients, and other constituents behind. In turn, concentrations of these constituents increase in remaining surface water or shallow groundwater. Reduced streamflow also decreases dilution capacity, increases residence time, and can elevate stream temperatures, and reduce DO all of which may contribute to degraded aquatic habitat and reduced attainment of beneficial uses (Nilsson and Renöfält 2008). As a result, managing excessive riparian vegetation is necessary for managing water quality and water quantity within the Peavine Creek watershed.

Stakeholders, including local landowners and NDF staff, have observed multiple areas of vegetative homogenization (Figure 3-3), primarily willow and Russian olive, within the Peavine Creek riparian corridor, concentrated downstream from the Peavine Creek Campground. Though studies to quantify vegetative cover have not been completed, these observations suggest that willow overgrowth may be contributing to reduce instream flows and groundwater recharge and consequently, influencing the concentration of pollutants of concern across the watershed. A more comprehensive study of vegetation distribution across the riparian corridor and greater watershed may be necessary to identify areas where vegetation management activities will have the greatest net benefit to water quantity and water quality.

Figure 3-3. Homogeneous riparian vegetation along the main stem of Peavine Creek.

3.2.1.5 RECREATION

Recreational use within watersheds can influence water quality, hydrologic processes, and overall watershed condition. Activities such as hiking, horseback riding, and OHV use can increase sediment and nutrient delivery to nearby streams, particularly where trails intersect drainage pathways (Ouren et al. 2007). In mountain recreation areas, high levels of non-motorized use have been associated with increases in suspended solids, nutrients, and organic carbon in nearby streams (Flack et al. 1988). Elevated sediment loads can increase turbidity and degrade aquatic habitat (Ouren et al. 2007), while improperly managed equestrian or canine waste may introduce bacteriological contaminants such as *E. coli*.

Motorized recreation, particularly OHV use, can compact soils, create ruts, and reduce infiltration, which can increase runoff and sediment transport during storm events (Ouren et al. 2007). Streams draining OHV trail networks may exhibit elevated suspended sediment following trail development and use (Miniat et al. 2019), and vehicle operation also introduces the potential for hydrocarbon or chemical contamination. Unpaved roadways can become a significant source of sediment loading to waterways, particularly if they are not regularly repaired and maintained. Although OHV and regular vehicle use on roadways can exacerbate erosion and sedimentation from roads, precipitation falling on roadways or runoff from upgradient precipitation can mobilize loose sediments from unpaved roads and carry them to nearby waterways. Across the watershed, there are approximately 18 miles of unpaved roads. In 2025, USFS staff have indicated that roadways within the upper, USFS-managed portions of the western watershed have not been maintained or repaired at regular intervals. USFS staff indicated that these maintenance challenges are the result of limited capacity, funding, and competing priorities to complete necessary maintenance. This suggests that sediment from roadways in the upper watershed could be contributors to sediment loading near the headwaters of and tributaries to Peavine Creek. Section 4.1 outlines activities aimed at identifying roadways in need of maintenance and identifying the potential impacts of erosion from unpaved roads on water quality and watershed health.

Camping and other concentrated recreation can also contribute localized nutrient and contaminant inputs from human and waste (Clow et al. 2013). When unmanaged or highly concentrated, these activities can increase erosion, alter runoff processes, and degrade water quality (Ouren et al. 2007).

Recreational pressure in the Peavine Creek watershed appears to vary seasonally. Although visitation data are limited, discussions with stakeholders indicate that peak use occurs from summer through fall, with camping and hunting representing the primary activities during these periods. Stakeholders have also reported instances of recreationists temporarily damming Peavine Creek at the campground, which can alter local hydrology and potentially affect downstream conditions. During the hunting season, the campground is often used as a staging area, and hunters frequently use horses to access areas of the watershed, introducing additional potential sources of disturbance and waste.

Improved monitoring of recreational use and associated water quality indicators would help identify recreation-related impacts within the Peavine Creek watershed and inform future management and implementation efforts.

3.2.1.6 LEGACY MINING

Legacy mine features can remain a long-term source of nonpoint source pollution because water that comes into contact with abandoned workings, waste rock, or tailings may become contaminated and move pollutants into nearby surface water or groundwater long after mining has ceased (EPA 2000). Acid mine drainage can lower pH and mobilize dissolved metals, which can degrade water quality and harm aquatic life, livestock, and other downstream uses (EPA 2024b). Mine features can also contribute sediment and metal-bearing materials to streams through erosion and runoff, extending impacts beyond the footprint of the original site and across larger portions of a watershed (EPA 2000). Documenting the location and type of mine features in the watershed is an important step in evaluating potential pollutant sources and prioritizing future implementation efforts.

Mining persisted across the planning area from 1963 through 1987 resulting in numerous legacy mine features (Table 3-2) (USGS 2026). Most legacy mine features are sited in the eastern portion of the planning area at the southern end of the Toquima Range within USFS-managed land (Figure 3-4). There are several mine features cited within the western portion of the watershed as well, including the area's only open pit mine, which is within Horse Canyon. National Hydrologic Dataset data indicates that there is an ephemeral stream in proximity to the mine, however field observations are necessary to confirm whether the channel is active and has regular, seasonal flow. Open pit mines present unique challenge to watershed planning as they can impound precipitation and runoff in the open pit. These impounded waters may be more prone to evaporation given their greater surface area and pollutant concentrations may increase overtime with evaporation. These impounded waters present a risk to groundwater resources and, if there is connectivity, surface water resources as well. The extent of legacy mining pollution is currently unknown and the impacts of legacy mining on water quality and watershed function may persist today. Continued monitoring of metals and metalloids, pH, and sulfate levels will provide greater resolution to the impacts of legacy mining on water quality within Peavine Creek and the health of the surrounding watershed. Hydrologic impacts of legacy mining are more difficult to quantify, as mine features may not always be accessible and therefore the impacts of legacy mining across the watershed are currently unclear. Because it is currently unclear whether legacy mining is contributing to water quality impairments in Peavine Creek, no management measures are proposed at this time to address this potential pollution source. However, the monitoring program described in Section 4.6 includes sampling of tributaries and downstream reaches of Peavine Creek located below legacy mining features to evaluate potential metals impairments. If monitoring results indicate that legacy mining is affecting water quality, future revisions and updates to this watershed plan may include additional management measures based on those findings.

Table 3-2. Legacy Mining Features within the Peavine Creek Watershed

Mine Feature	Count of Mine Features
Adit	14
Borrow pit	1
Gravel pit	2
Mine shaft	35
Open pit mine	1
Prospect pit	319

(Source: USGS 2026)

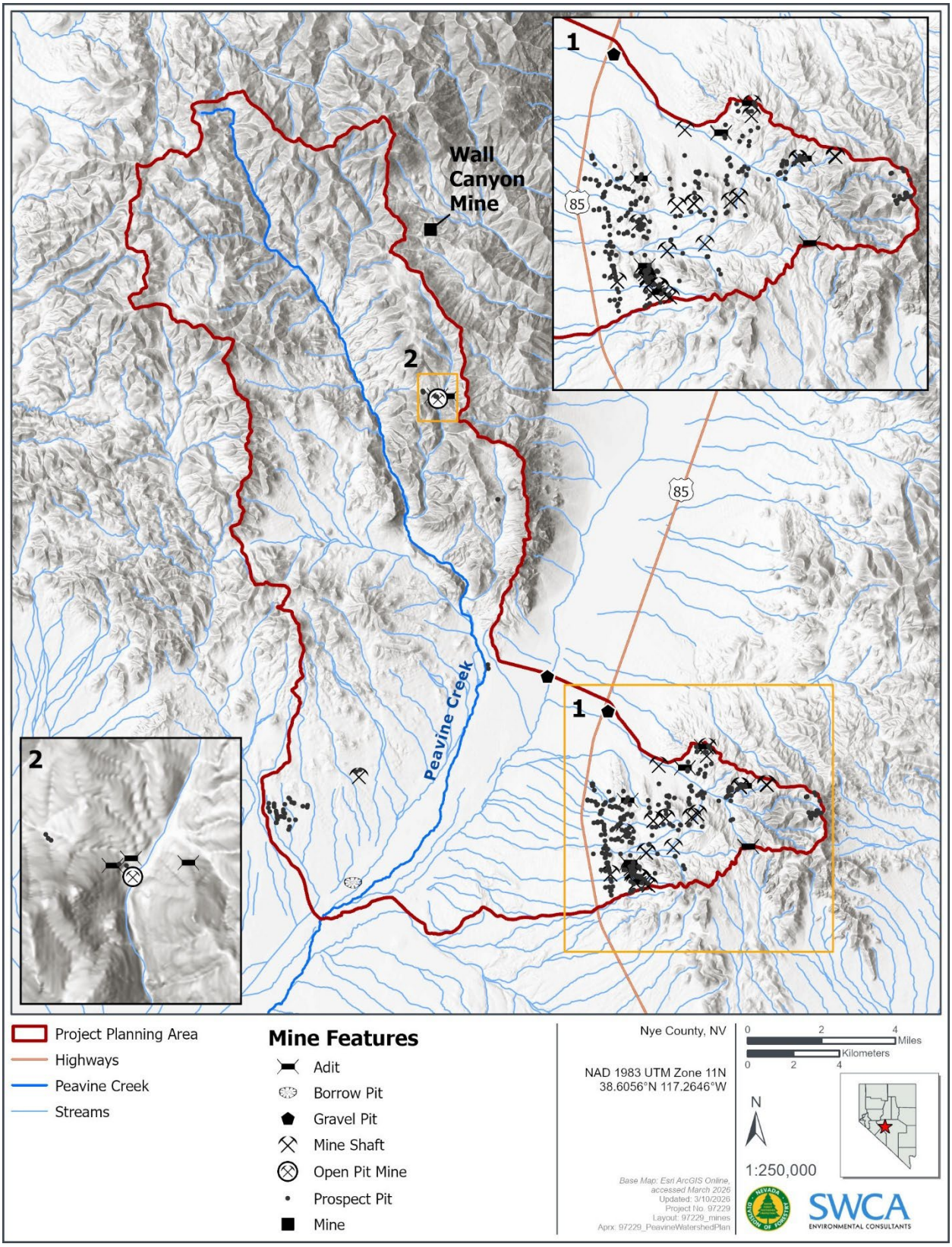


Figure 3-4. Legacy mining features within the Peavine Creek watershed.

3.2.1.7 NATURAL BACKGROUND

Natural background sources of pollutants play a significant role in shaping water quality across various ecosystems. These sources include geological formations, soil erosion, and natural biological processes that release substances into water bodies (EPA 2023). Minerals from rocks and soils can dissolve into water, introducing elements such as arsenic, lead, and mercury, which may naturally occur at levels that affect water quality (see Section 2.1.2 for more details related to project area soils and erosion potential). Additionally, organic matter from decaying vegetation and animal waste can contribute nutrients like nitrogen and phosphorus to aquatic systems. Although these nutrients are essential for aquatic life, their excess can lead to eutrophication, causing algal blooms and subsequent oxygen depletion in water bodies. Controlling excess concentrations from natural background sources can be difficult because actions taken to manage water quality are typically aimed at anthropogenic sources of watershed and water quality degradation; therefore, understanding the impact of natural background sources is crucial for distinguishing between anthropogenic pollution and natural contributions to water quality issues. Publicly available water quality and landscape data necessary for characterizing natural background sources of pollution is limited within the project area. Additional data are necessary to develop a comprehensive understanding of pollutant loading from natural background sources. Selected activities outlined in Section 4 are aimed at increasing understanding of watershed conditions and how natural background pollution impacts water quality.

Additionally, climatic and environmental factors can influence the extent and impact of natural background pollutants. Seasonal variations, such as increased rainfall or snowmelt, can enhance the mobilization and transport of these pollutants into water bodies, leading to temporary spikes in their concentrations. Similarly, events like wildfires can affect watershed health and water quality by altering hydrologic function through increased flood intensity and overland runoff. Debris flows and erosion are common in post-fire landscapes and can contribute to the delivery of sediment, nutrients, dissolved organic carbon and some metals to downstream waterways (USGS 2012). Over the last 25 years, there have been four recorded wildfires within the planning area, ranging between 0.10 and 4.00 acres in size (Nevada Fire Info 2026). Several wildfires have occurred adjacent to the planning area in the same time frame, with incidences primarily concentrated along the eastern border of the Toiyabe Range where landscapes are similar to those found within the planning area (Nevada Fire Info 2026). Wildfires continue to present a risk to watershed health and water quality within the planning area, and Section 4.1 details implementation activities aimed at wildfire vulnerability reduction within the watershed.

3.3 Water Quality Data Inventory and Evaluation

Surface waters in the Peavine Creek watershed are monitored as part of NDEPs Bureau of Water Quality Planning program (BWQP). BWQP is responsible for monitoring the chemical and biological health of surface water throughout the state and management of the surface water quality and biological data. These data are used to support other BWQP water quality management programs such as expanding water quality standard coverage, TMDL development and monitoring, and assessment requirements for 303(d)/305(b) reports.

Water quality data for Peavine Creek is limited. Since 2005, a total of five sampling events have been conducted at a single sampling location along Peavine Creek (Figure 3-5). Parameters measured during these events were compared to the water quality standards outlined in NAC 445 (Table 3-3). Summary statistics, including the average, minimum, maximum, and percentage of exceedances of relevant water quality criteria are provided in Table 3-4. Of the parameters analyzed, total phosphorus was the only constituent with samples exceeding applicable standards, with exceedances observed in 25% (n = 1) of the samples collected (n = 4).

Due to the limited spatial and temporal extent of available water quality data for Peavine Creek, additional monitoring is needed to better evaluate potential water quality concerns and their associated sources, as discussed in Section 3.2. Section 4.6 presents a proposed monitoring program designed to address these data gaps within the Peavine Creek watershed.

In addition to the discrete sampling events, a temperature sonde was deployed from April 2025 through the end of October 2025 and recorded water temperature at 15-minute intervals (Figure 3-6). The sonde was installed at the same monitoring location as the other water quality sampling site (see Figure 3-5). During this period, the average water temperature was 11.1 ± 1.1 degrees Celsius (°C), and the maximum observed temperature was 13°C, which is well below the applicable maximum temperature standard for Peavine Creek (20°C).

This monitoring location is situated in a reach of the creek with relatively limited influence from the primary stressors discussed in Section 3.2.1 and is heavily shaded by dense cottonwood (*Populus* sp.) trees. Additional temperature monitoring would help determine whether temperature criteria are being met in the lower portions of Peavine Creek, where water diversions are more prevalent and streamflow and water volume may be reduced.

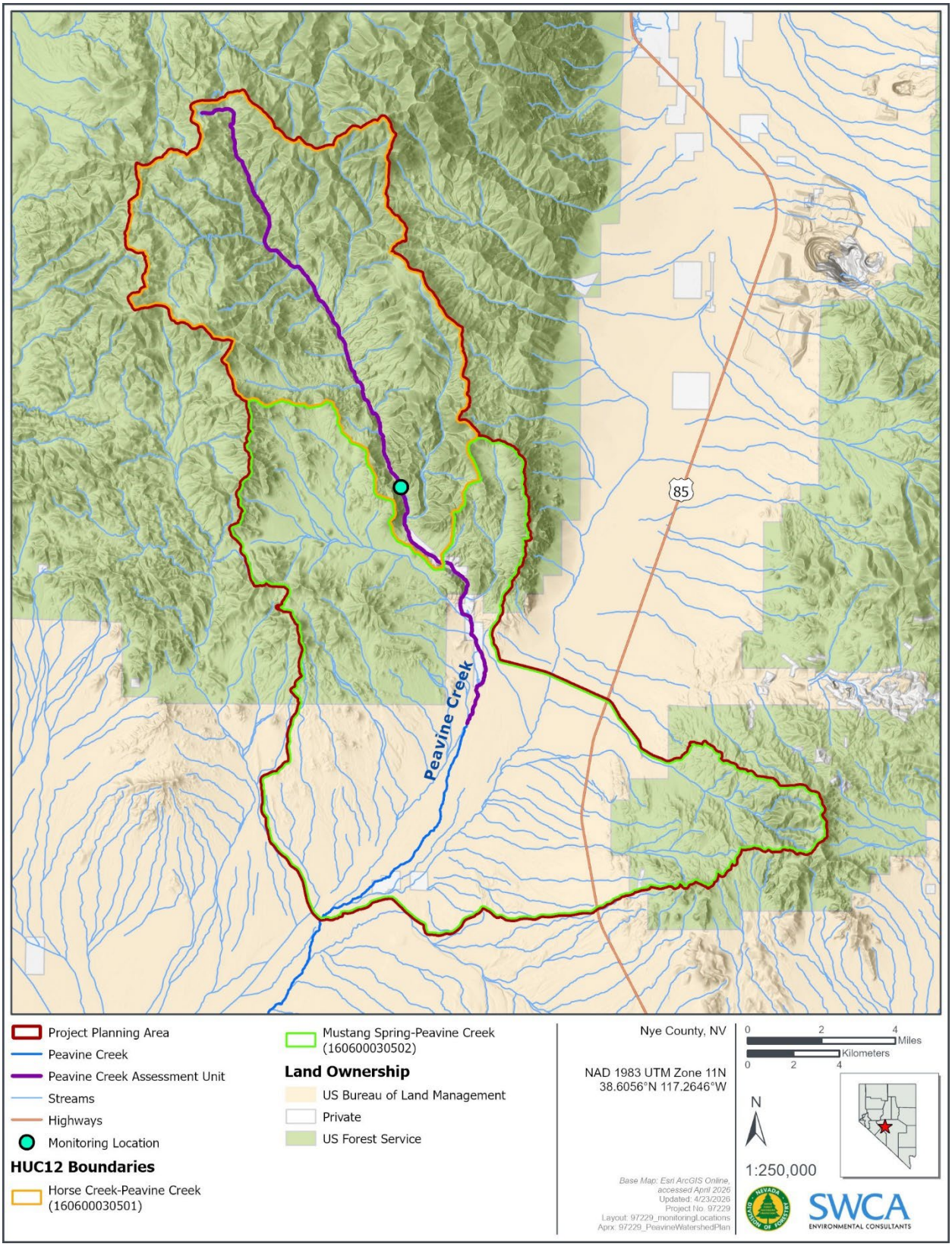


Figure 3-5. Water quality sample location on Peavine Creek.

Table 3-3. Water Quality Standards for Peavine Creek

Parameter*	Water Quality Standards†
Temperature ºC	S.V. ≤ 20
pH	S.V. 6.5 – 9.0
DO (mg/L)	S.V. ≥ 6.0
Total phosphorus (as P) (mg/L)	S.V. ≤ 0.10
Total ammonia (as N) (mg/L)	c
Total dissolved solids (mg/L)	S.V. ≤ 500
E. coli (cfu/100mL)	G.M. ≤ 126 S.V. ≤410
Fecal coliform (No./100 mL)	S.V. ≤ 1,000
Toxic materials	e

* P = Phosphorus, N = Nitrogen

† S.V. = Single Value; c = The water quality criteria for ammonia are temperature and pH dependent and are specified in NAC 445A.118; G.M.= Geometric Mean; e = The water quality criteria for toxic materials are specified in NAC 445A 1236

Table 3-4. Summary Statistics of Water Quality Data Collected from Peavine Creek and Their Percentage Exceedance when Compared to Water Quality Standards

Parameter Name*	Average	Minimum	Maximum	Sample Count	Percentage Exceedance †
Total ammonia (as N) (mg/L)	0.1	0.1	0.1	1	0
Antimony, total (µg/L)	2.3	1.1	5	4	0
Antimony dissolved (µg/L)	1.4	1.1	2	3	0
Arsenic, total (µg/L)	3.80	3	3.2	4	0
Arsenic, dissolved (µg/L)	2.85	2.7	3	4	0
Barium (µg/L)	25.5	23	30	4	0
Barium, dissolved (µg/L)	23.67	23	24	3	0
Beryllium (µg/L)	1.09	0.18	2	4	0
Beryllium, dissolved (µg/L)	0.79	0.18	2	3	0
Boron (µg/L)	81.5	67	100	4	0
Boron, dissolved (µg/L)	76.33	68	82	3	0
Cadmium, total (µg/L)	0.94	0.37	2	4	0
Cadmium, dissolved (µg/L)	0.94	0.37	2	4	0
Copper (µg/L)	1.4	0.8	2	4	0
Copper, dissolved (µg/L)	1.4	0.8	2	4	0
DO mg/L	7.49	6.67	8.7	5	0
E. coli (MPN/100mL)	4.55	1	10	4	0
Fecal coliform (MPN/100mL)	6	2	10	4	0
Fluoride (µg/L)	137.5	100	200	4	0
Lead (µg/L)	1.02	0.53	2	4	0
Lead, dissolved (µg/L)	1.02	0.53	2	4	0

Parameter Name*	Average	Minimum	Maximum	Sample Count	Percentage Exceedance †
Manganese (µg/L)	15.25	11	20	4	0
Manganese, dissolved (µg/L)	9.2	7.8	11	3	0
Mercury (µg/L)	9.06E-2	5.00E-3	0.2	4	0
Mercury, dissolved (µg/L)	0.13	5.00E-3	0.20	4	0
Molybdenum (µg/L)	6	1.9	10	4	0
Molybdenum, dissolved (µg/L)	4.57	1.8	10	3	0
Nickel (µg/L)	2.21	0.91	5	4	0
Nickel, dissolved (µg/L)	2.21	0.91	5	4	0
Selenium (µg/L)	4.5	2	10	4	0
Selenium, dissolved (µg/L)	4.5	2	10	4	0
Silver (µg/L)	1.09	0.64	2	3	0
Silver, dissolved (µg/L)	1.32	0.64	2	4	0
Total dissolved solids, Lab (mg/L)	188.75	155	210	4	0
TSS (mg/L)	6.05	4.2	10	4	0
Thallium (µg/L)	0.56	0.11	1	4	0
Thallium, dissolved (µg/L)	0.41	0.11	1	3	0
Total coliform (MPN/100mL)	238.68	101.4	429	4	0
Total nitrogen (mg/L)	0.40	0.25	0.6	4	0
Total phosphorus (mg/L)	9.13E-2	0.03	**0.27**	4	**25%**
Turbidity, lab (NTU)	0.85	0.39	1.9	4	0
Zinc (µg/L)	8.8	2.6	20	4	0
Zinc, dissolved (µg/L)	16.9	2.6	42	4	0
pH, field (SU)	7.38	7.21	7.71	5	0
pH, lab (SU)	7.99	7.88	8.14	4	0

* N = Nitrogen; MPN = most probable number; TSS = total suspended solids; NTU = nephelometric units

† = Percentage exceedance as compared to the water quality standards outlined in NAC 445.

Bolded values indicate exceedances of the water quality standards outlined in Table 3-4.

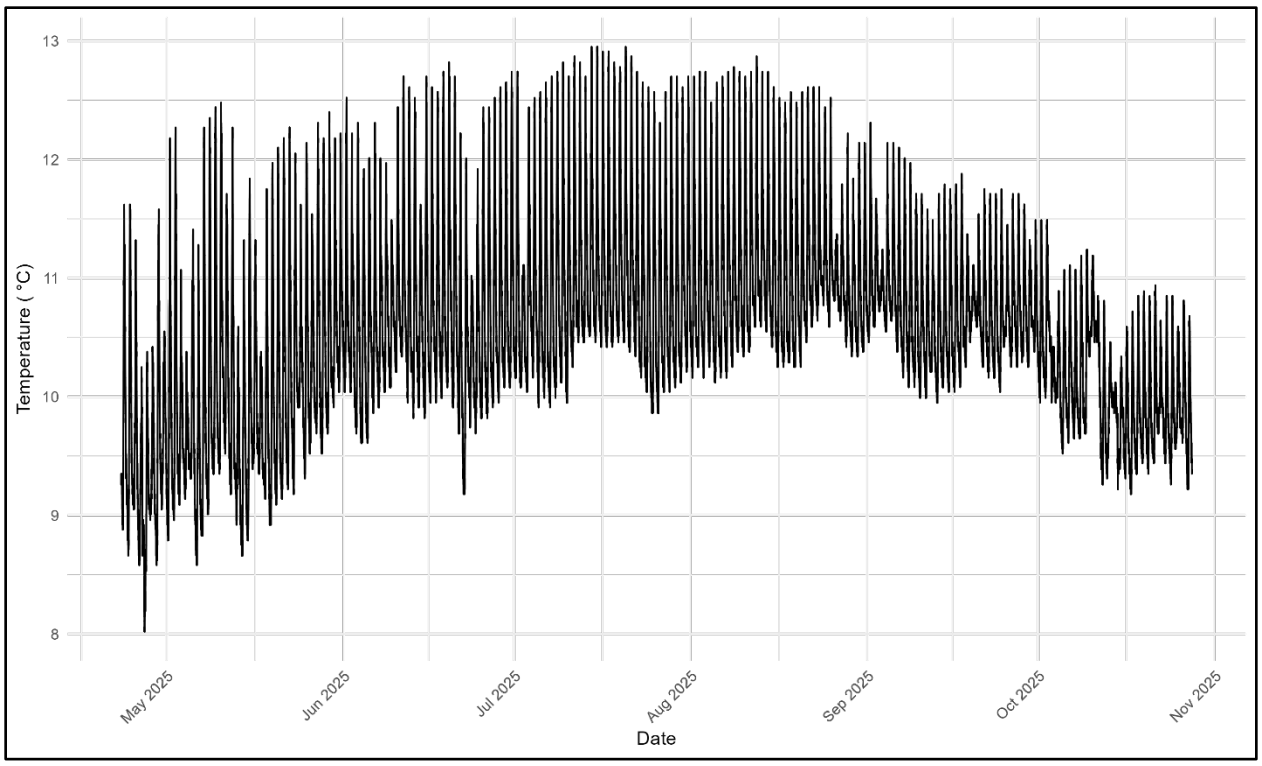


Figure 3-6. Temperature data collected on Peavine Creek near the campground from April 2025 through October 2025.

Note: The maximum temperature standard for Peavine Creek is 20ºC (NAC 445A)

3.4 Data Gaps

Data gaps identified during the watershed planning effort are provided in Table 3-5.

Table 3-5. Data Gaps in the Peavine Creek Watershed

Data Gap	Discussion and Recommendation
Existing and projected population data	No population projections are available for the planning area. Although census data are available at broader geographic scales, the spatial resolution is not sufficient to accurately estimate population within the watershed. Development of population estimates or projections specific to the watershed would improve understanding of potential future water demand, wastewater generation, and recreation pressure.
Limited water quality data	Historic water quality sampling within the watershed is limited, and available data are sparse both spatially and temporally. Additional water quality monitoring throughout the watershed would improve understanding of baseline conditions, identify potential pollutant sources, and support evaluation of future management actions.
Limited water quantity data	Water quantity information within the watershed is limited. Surface water withdrawals and usage from Peavine Creek are not currently monitored, groundwater withdrawals are largely unknown, and the total number and location of surface water diversions have not been fully documented. Mapping and monitoring water diversions and groundwater withdrawals would improve understanding of watershed water availability and hydrologic conditions.
Climate data	Local climate data for the watershed are limited. Existing weather stations used to characterize conditions in the watershed are outside the planning area and at slightly different elevations, which may not accurately represent local precipitation and temperature patterns. Establishing additional monitoring stations closer to the watershed would improve the accuracy of climate and hydrologic analyses.

Data Gap	Discussion and Recommendation
Soil distribution data	Soil data coverage within the watershed is incomplete. Soil mapping data are missing for upstream areas of the watershed located within USFS-managed lands. Additional soil mapping or verification would improve understanding of erosion potential, infiltration characteristics, and land management considerations within these areas.
Wildlife population data	Wildlife population information within the watershed is limited. While some fish species are known to occur in the watershed, observational data on fish populations and other wildlife species are sparse. Additional biological surveys would improve understanding of species presence, habitat conditions, and potential ecological stressors.
Recreation visitation	No formal records exist documenting the number of visitors to the campground or surrounding planning area. Improved tracking of recreation visitation, particularly during peak seasons, would help assess potential impacts to water quality, riparian areas, and watershed resources.
Channel morphology	Portions of the stream channel appear to be experiencing erosion and possible incision; however, these areas have not been mapped or formally assessed. A stream channel survey and stability assessment would help identify areas of concern and support development of appropriate restoration or management actions.

3.5 Estimated Pollutant Loading and Load Reductions

b

EPA ELEMENT

Quantify current loads using monitoring/modeling to estimate necessary load reductions and how much each implementation action will reduce pollutant loads.

The EPA's PLET is a web-based, planning-level model used to estimate long-term annual nutrient and sediment loads from different land uses and to quantify potential load reductions from implementing BMPs (EPA 2024a). PLET uses simplified algorithms and nationally consistent datasets to calculate runoff, pollutant loading, and sediment delivery, making it well suited for watershed planning, Section 319 reporting, and comparison of conservation scenarios.

PLET was selected for this effort due to the absence of continuous flow data within the watershed and the limited number of available water quality samples ($n < 5$), which precluded direct calculation of pollutant loads. The tool was used to independently estimate existing pollutant loads for nitrogen, phosphorus, biological oxygen demand, and sediment within the two HUC-12 watersheds in the Peavine Creek watershed (Table 3-6; see Figure 3-5).

As NDF and its partners implement this plan, PLET can also be used to estimate the magnitude of pollutant load reductions associated with specific BMPs over time. Because available watershed data are limited and the sources and causes of pollution are not yet well characterized, estimated load reduction efficiencies generated by the PLET model were used to address the second component of EPA Element B: estimating the necessary load reductions and the expected reductions associated with each implementation action. Although this approach is acceptable for planning purposes, EPA identifies it as a less-preferred method where site-specific monitoring data are limited (EPA 2008). Accordingly, EPA recommends incorporating a schedule for updating the watershed plan and refining load reduction estimates as additional data become available. This update is incorporated in Sections 4.3 and 4.4 and is proposed to occur within 5 years, following implementation of the monitoring program outlined in Section 4.6 and collection of additional water quality data.

Table 3-6. PLET Estimated Nitrogen, Phosphorus, Biological Oxygen Demand, and Sediment Loading

HUC 12	Nitrogen Load (pound/year)	Phosphorus Load (pounds/year)	Biological Oxygen Demand Load (pounds/year)	Sediment Load (tons/year)
Horse Creek-Peavine Creek (160600030501)	30,827	2,692	10,142	29
Mustang Spring-Peavine Creek (160600030502)	10,304	938	3,974	47
Total	**41,131**	**3,630**	**14,116**	**76**

4 IMPLEMENTATION PLAN

This section presents the implementation plan developed for the Peavine Creek watershed in accordance with the EPA's nine-element watershed planning guidance for implementation planning (EPA 2008). The plan was informed by the watershed characterization and source identification presented in Sections 2 and 3, as well as input gathered through multiple stakeholder meetings and discussions conducted during the watershed tour on November 13, 2025 (see Section 1.3). The implementation plan is also intended to support the overarching goals and objectives of the watershed plan described in Section 1.4. Accordingly, the plan is designed to support both restoration and protection efforts by identifying management measures that reduce pollutant loading, maintain existing uses, and help prevent avoidable degradation of water quality within the planning area.

The implementation plan includes individual projects and activities (management measures) to be implemented between 2026 and 2035. Management measures are summarized in Tables 4-1 through 4-5. Potential funding sources associated with each management measure are described in Section 4.2 to provide clear connections between funding opportunities and planned actions. Information and outreach activities are summarized in Table 4-7 and discussed in Section 4.3. Section 4.4 and Table 4-8 present the approximate schedule for implementation of management measures, information and outreach activities, and monitoring plan. Section 4.2 outlines the estimated unit costs and potential funding sources for management measures, outreach activities, and monitoring activities. Section 4.5 outlines milestones for each management measure and describes the criteria and indicators that will be used to evaluate implementation progress. Section 4.6 describes the monitoring program intended to address data gaps and provide indicators for measuring progress on selected implementation activities; Table 4-10 summarizes the monitoring plan.

Table A-1 in Appendix A provides a comprehensive summary of all management measures and information and outreach activities included in this section. The table is intended to serve as a stand-alone roadmap that consolidates implementation details into a single reference document.

Together, these sections present a 10-year implementation strategy focused primarily on addressing nonpoint source pollution concerns within the Peavine Creek watershed. Implementation activities are intended to provide multiple benefits across stakeholder interests and watershed water quality goals identified in Section 1.4. The implementation plan is intended to be adaptive and will serve as a reference for NDF and project partners throughout implementation within the watershed.

4.1 Management Measures

EPA ELEMENT

C

Specify the BMPs/practices to be used, why they were chosen, and where they will be located. Prioritize "critical areas" where actions yield the greatest benefit.

As part of the EPA Nine-Element watershed planning process, plans must identify sources of pollution (Element a) and estimate existing pollutant loads and the reductions expected from implementation activities (Element b). Because data are limited and no TMDLs currently exist for the watershed, expected load reductions were estimated using the EPA's PLET model for nitrogen, phosphorus, biological oxygen demand and sediment. The PLET model has limited management measures for which it provides load reduction efficiencies, which represent a surrogate for load reductions. Where the PLET model could not run management measures, relevant literature values were used, when available. Results are summarized in the "Load Reductions" column in the management measures tables in each of the subsections within this chapter (Tables 4-2 through 4-5). This section addresses EPA Element c and describes management measures and critical areas within the Peavine Creek watershed. Figure 4-1 provides an overview of where management measures will occur throughout the watershed. More detailed maps are included for each management measure area, highlighting the critical areas and providing implementation details.

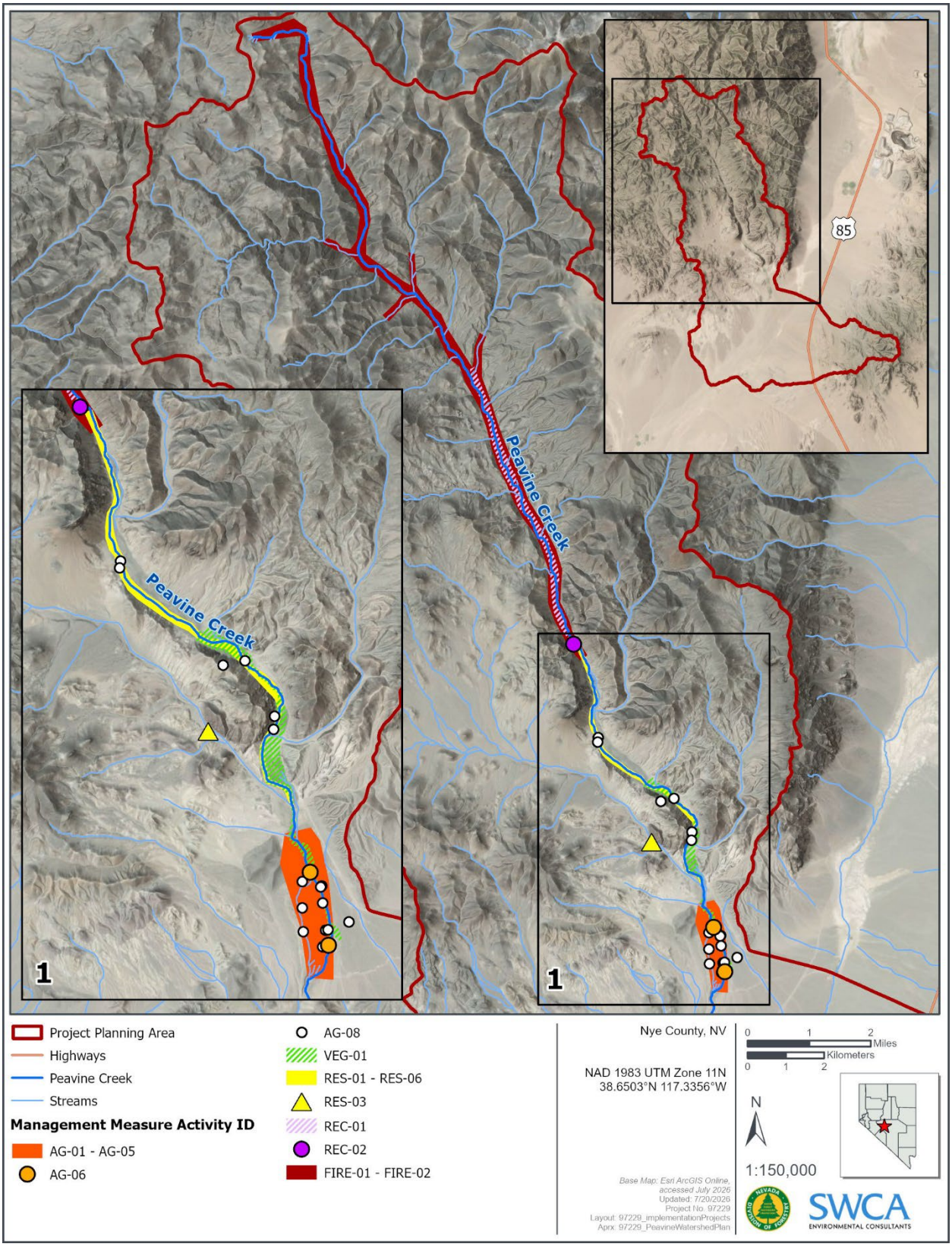


Figure 4-1. Overview of critical area locations where managemental measures will occur.

4.1.1 Agricultural Management

APPROACH DESCRIPTION

Agricultural lands and surface water diversions in the lower Peavine Creek watershed influence instream flows, sediment transport, nutrient loading, and riparian condition. Irrigation infrastructure, livestock management, and drainage practices can affect streambank stability, vegetation cover, and water quality, particularly where runoff, erosion, or prolonged livestock use occurs near streams and riparian areas (Belsky et al. 1999; Sabater and Tackner 2009). Implementation efforts in the watershed will focus on management measures that improve irrigation and water conveyance efficiency, reduce sediment and nutrient delivery, maintain soil productivity, support healthy pasture and riparian vegetation conditions, improve livestock distribution, and enhance long-term watershed resilience while maintaining agricultural productivity, existing water rights, and reliable water access for working lands (Table 4-1). Management measures include nutrient and grazing management planning, rotational grazing, manure and drainage management, off-channel watering systems, stabilization of livestock access points, irrigation system upgrades, and diversion and canal improvements. Many landowners are already implementing these types of practices in the watershed, and this plan is intended to build on those existing efforts by expanding successful BMP implementation through collaboration, technical assistance, and voluntary participation.

APPROPRIATE SETTINGS

Irrigated agricultural lands, grazing allotments, pastures, riparian corridors, irrigation conveyance systems, corrals, and other working lands within the lower Peavine Creek watershed.

SECONDARY BENEFITS

Enhanced wildlife habitat, increased drought resilience, improved forage conditions, reduced infrastructure maintenance needs, and greater long-term sustainability of agricultural operations.

LIMITATIONS

1. ***Landowner Coordination:*** Many management measures require voluntary participation and coordination among multiple private landowners, irrigation users, and partner organizations.
2. ***Maintenance Requirements:*** Infrastructure improvements and grazing management practices often require regular maintenance and adaptive management to remain effective over time.
3. ***Water Availability and Water Rights:*** Irrigation improvements must be compatible with existing water rights, water delivery needs, and seasonal water availability.
4. ***Cost and Implementation Scale:*** Some practices, including irrigation infrastructure upgrades and livestock watering systems, may require substantial funding and long-term investment to implement across the watershed.

Table 4-1. Agricultural Management Measures Proposed for Implementation in the Peavine Creek Watershed

Activity ID	Management Measures	Load Reductions from PLET*
AG-01	NUTRIENT AND GRAZING MANAGEMENT PLAN Develop and implement nutrient and grazing management plans for agricultural operations in the lower Peavine Creek watershed to guide fertilizer application, livestock distribution, stocking rates, and pasture rotation in order to maintain soil productivity, reduce erosion, and minimize nutrient runoff to streams and riparian areas.	No load reductions from creating the plan. Reductions will occur through implementation of management measures outlined in the plan.

Activity ID	Management Measures	Load Reductions from PLET*
AG-02	ROTATIONAL GRAZING Implement rotational or adaptive grazing systems throughout the watershed to improve pasture recovery, maintain vegetative cover, reduce soil disturbance, and limit prolonged livestock use of riparian areas and stream corridors.	N removal efficiency = 43% P removal efficiency = 26%
AG-03	MANURE MANAGEMENT Improve manure storage, handling, and land application practices at agricultural operations to reduce nutrient and bacteria runoff to nearby waterways while supporting appropriate reuse of manure as fertilizer.	N removal efficiency = 15% P removal efficiency = 45%
AG-04	DRAINAGE MANAGEMENT Install or improve drainage management features around pastures, barns, pens, corrals, and other agricultural areas to reduce runoff containing sediment, nutrients, and waste from entering streams and drainage channels within the watershed.	N removal efficiency = 39% P removal efficiency = 35%
AG-05	OFF-CHANNEL WATERING SYSTEMS Install off-channel livestock watering systems, such as troughs or tanks, to reduce livestock concentration in streams and riparian areas and minimize impacts to streambanks and water quality.	N removal efficiency = 18% P removal efficiency = 13% S removal efficiency = 20%
AG-06	STABLIZE STREAMBANKS AT CATTLE ACCESS POINTS Stabilize designated livestock access points along streams on private lands using appropriate erosion control and bank stabilization measures to better manage cattle access and reduce sediment, nutrient, and bank erosion impacts.	N removal efficiency† = 75% P removal efficiency† = 75% S removal efficiency† = 75%
AG-07	IRRIGATION SYSTEM IMPROVEMENTS Upgrade irrigation infrastructure, including conversion of flood irrigation systems to more efficient sprinkler or pivot systems where feasible, to improve water use efficiency and reduce excess runoff and return flows.	Load reductions linked to flow management; not quantified by PLET.
AG-08	DIVERSION/CANAL IMPROVEMENTS Repair, stabilize, or upgrade diversions, canals, culverts, and stream crossings throughout the watershed to reduce water loss, improve conveyance efficiency, and minimize erosion and sediment delivery to Peavine Creek.	Load reductions linked to flow management; not quantified by PLET.

Notes: N = Nitrogen; P = Phosphorus; S = Sediment

* Because data are limited and no TMDLs currently exist for the watershed, expected load reductions were estimated using EPA's PLET when available (EPA 2026c). These efficiency estimates assume BMP implementation across 100% of the affected area; if implementation occurs on less than 100% of the area, the estimated efficiencies would be proportionally reduced.

† These efficiency estimates assume implementation in conjunction with livestock exclusion fencing. Because landowners do not wish to exclude fully cattle from stream access, actual efficiencies are expected to be lower than PLET estimates.

PROJECT PARTNERS

- Nevada Division of Agriculture (NDA)
- NRCS
- NDF
- Private Landowners

RELEVANT RESOURCES

- NRCS Field Office Technical Guide (NRCS 2026j)
- NRCS Prescribed Conservation Practice Standard Grazing Management (NRCS 2025a)
- Nevada BMP Handbook – Agriculture and Range BMPs (NDEP 2023)

Critical Areas

The lower portion of the Peavine Creek watershed, which includes a mix of private lands and USFS- and BLM-managed lands, has been identified as a critical area where agricultural activities, irrigation infrastructure, and livestock use may contribute to erosion, sediment transport, nutrient loading, and localized degradation of riparian conditions. Because this area contains a concentration of working agricultural lands, irrigation conveyance infrastructure, and livestock access locations adjacent to streams and riparian areas, it represents an important opportunity to implement targeted BMPs that support both water quality improvement and long-term agricultural sustainability. Figure 4-2 identifies the critical area where the management measures described in Table 4-1 will be implemented.

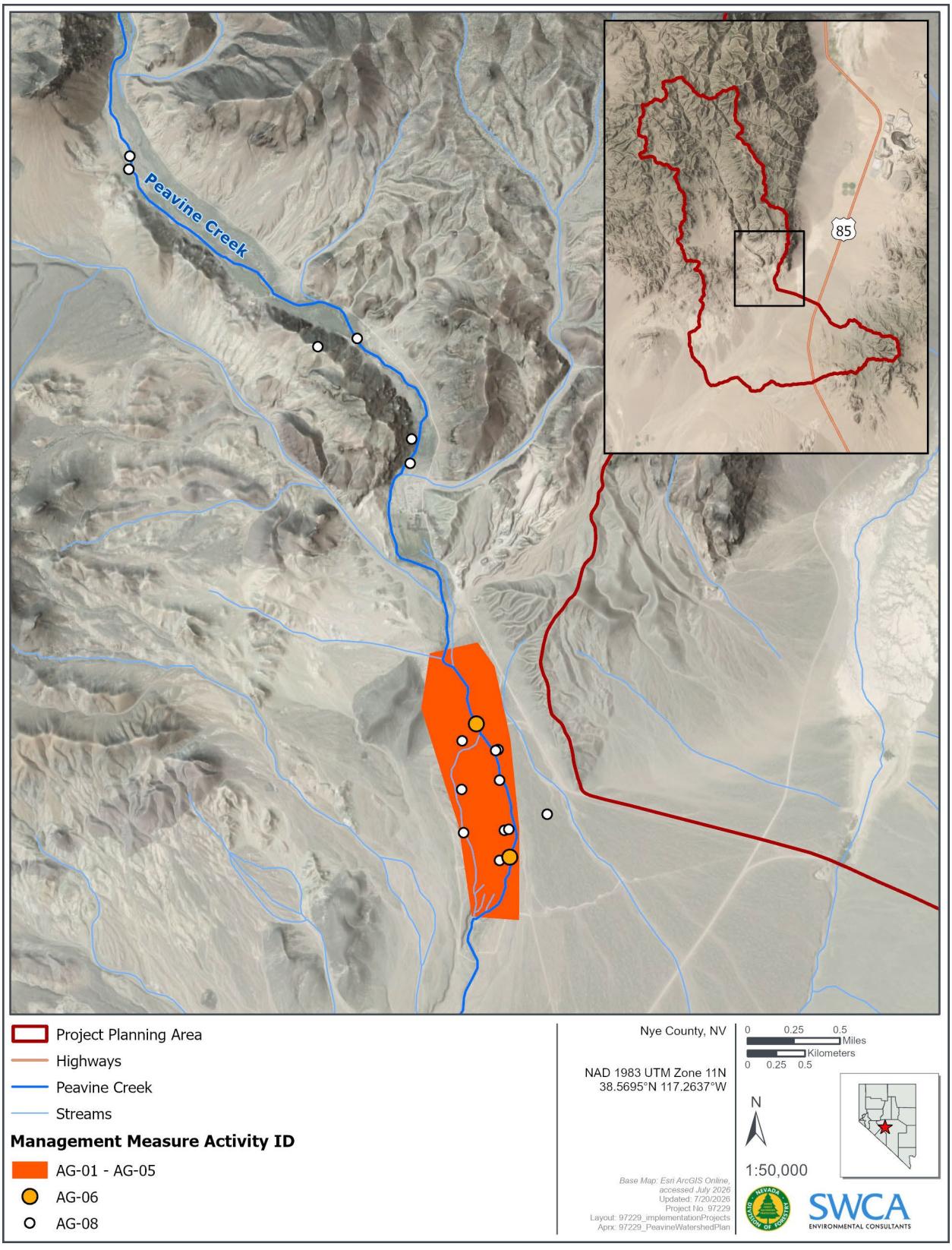


Figure 4-2. Critical areas of agricultural impacts targeted for management measure implementation.

4.1.2 Vegetation Management

APPROACH DESCRIPTION

Riparian vegetation plays an important role in maintaining streambank stability, filtering sediment and pollutants, moderating water temperatures, and supporting aquatic and terrestrial habitat throughout the Peavine Creek watershed. Invasive plant species such as tamarisk, Russian olive, and other nonnative vegetation can outcompete native riparian plants, alter hydrology, reduce habitat quality, and disrupt natural stream and floodplain processes. In some areas, invasive vegetation may also increase wildfire risk by contributing to dense or highly flammable fuel conditions (USFS 2012).

Implementation efforts in the Peavine Creek watershed will focus on identifying, prioritizing, and treating invasive vegetation while promoting the recovery and long-term maintenance of native riparian and upland plant communities (Table 4-2). Management measures will include invasive species removal, revegetation with native species, targeted vegetation management, and follow-up monitoring and maintenance activities. These actions are intended to improve riparian function, stabilize streambanks, reduce erosion potential, enhance habitat quality, and support long-term watershed resilience and ecological health.

Implementation of these measures will require coordination among private landowners, NDF, USFS, and other watershed stakeholders to identify priority treatment areas and refine management approaches. NDF conducted vegetation surveys in June 2026 to identify and map invasive species occurrences and areas of concern within the watershed (see Critical Areas section below). Information collected through these surveys will be used to support development of a watershed vegetation assessment and management strategy and to guide future restoration, invasive species treatment, and revegetation efforts in priority areas.

APPROPRIATE SETTINGS

Riparian corridors, wetlands, streambanks, irrigated areas, disturbed uplands, recreation corridors, and other locations where invasive vegetation affects watershed condition or native plant communities.

SECONDARY BENEFITS

Reduced wildfire risk, improved forage and recreational conditions, increased drought resilience, enhanced scenic values, and improved long-term land management efficiency.

LIMITATIONS

1. ***Long-Term Maintenance:*** Invasive species treatments often require repeated maintenance and monitoring to prevent reinfestation and ensure successful native vegetation establishment.
2. ***Access Constraints:*** Dense vegetation, difficult terrain, and limited land access may restrict treatment opportunities in some areas.
3. ***Disturbance Risks:*** Vegetation removal activities can temporarily disturb soils or vegetation if not carefully implemented and stabilized.
4. ***Funding and Treatment Scale:*** Effective invasive species management often requires sustained funding and coordinated treatment across large portions of the watershed.

Table 4-2. Invasive Species and Riparian Vegetation Management Measures Proposed for Implementation in the Peavine Creek Watershed

Activity ID	BMPs	Load Reductions
VEG-01	INVASIVE PLANT SPECIES REMOVAL Identify, prioritize, and implement invasive plant species treatment projects within riparian corridors and adjacent upland areas of the Peavine Creek watershed. Management actions may include mechanical, chemical, or manual removal of invasive vegetation such as tamarisk, Russian olive, and other nonnative species using methods appropriate for site conditions. Following treatment, revegetate disturbed areas with native riparian species where appropriate to improve riparian function, stabilize streambanks and soils, reduce erosion, enhance habitat quality, and increase long-term resistance to reinvasion.	No direct load reductions are associated with these activities; however, their intent is to improve overall stream and riparian conditions, which will provide indirect benefits to water quality.
	RIPARIAN VEGETATION THINNING Implement selective thinning and vegetation management projects in areas with dense or overgrown riparian vegetation to improve riparian health, maintain stream function, reduce hazardous fuel loads, and support healthy native plant community structure within the Peavine Creek watershed.	

Critical Areas

Riparian corridors within the lower half of the Peavine Creek watershed have been identified as priority implementation areas where invasive or overgrown vegetation may be affecting stream function, riparian habitat quality, and watershed condition (Figure 4-3). Field observations conducted by NDF in June 2026 identified several stream reaches and adjacent riparian areas where invasive vegetation, including tamarisk, Russian olive, and other nonnative species may be contributing to reduced native vegetation cover, altered channel and floodplain conditions, increased erosion potential, and degraded habitat conditions. In some locations, dense vegetation and accumulated fuels may also contribute to elevated wildfire risk.

The critical areas shown in Figure 4-3 represent preliminary priority areas for implementation of invasive species treatment, riparian vegetation management, revegetation, and follow-up maintenance activities. Although these areas were field verified, additional vegetation mapping, landowner coordination, and site-specific assessments will be needed to further refine treatment priorities and determine appropriate management approaches prior to implementation. Initial implementation efforts will focus on stakeholder coordination, access agreements where needed, detailed vegetation assessments, and identification of sites where invasive species removal and riparian restoration activities are expected to provide the greatest benefits to stream stability, riparian condition, habitat quality, and overall watershed function.

PROJECT PARTNERS
- NDF
- USFS
- NRCS

RELEVANT RESOURCES
- Nevada BMP Handbook – Ecosystem Restoration (NDEP 2023)
- National Best Management Practices for Water Quality Management on National Forest System Lands (USFS 2012)

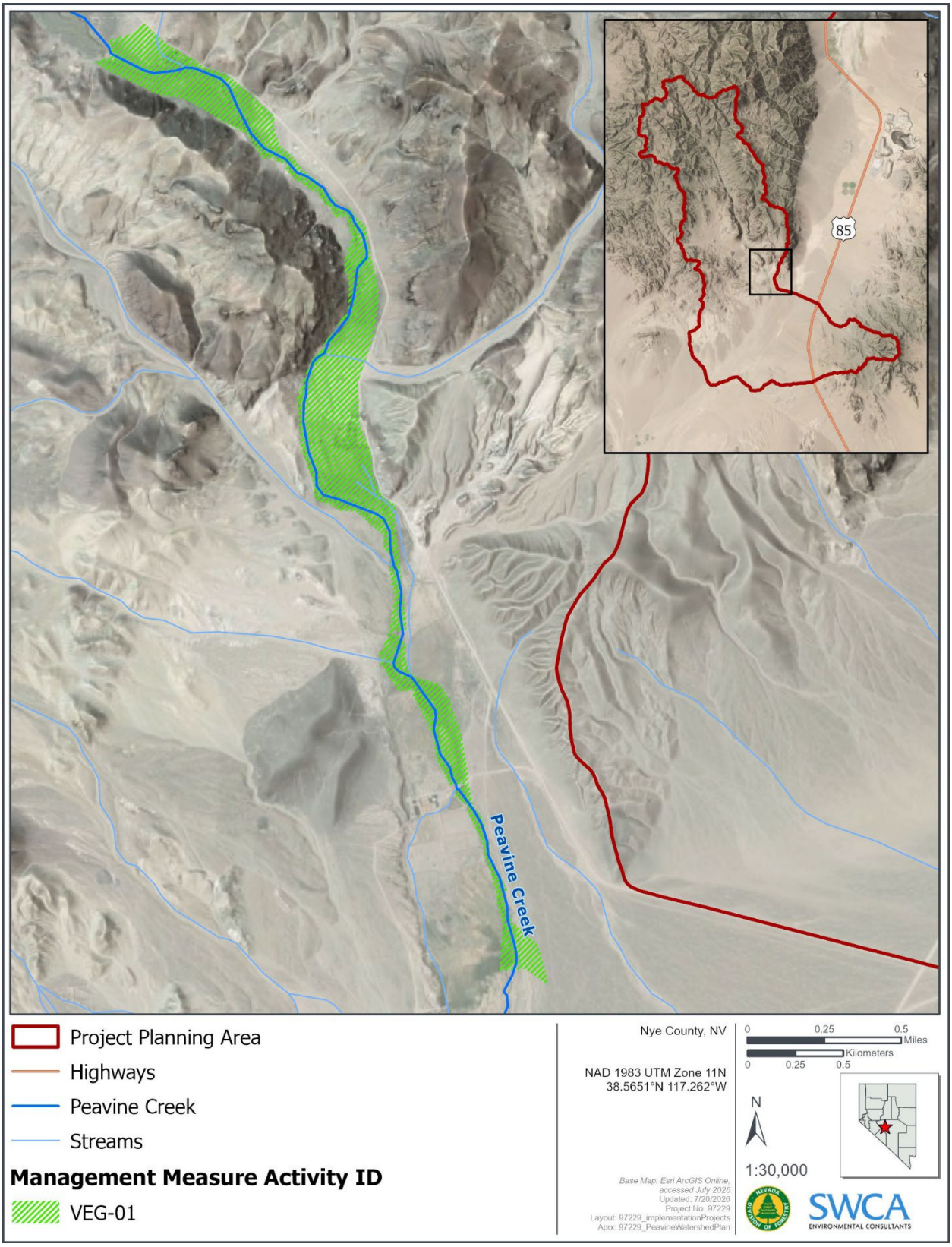


Figure 4-3. Critical areas of invasive and overgrown vegetation targeted for management measure implementation.

4.1.3 Process-Based Restoration

TIME FRAME: 3–8 years

APPROACH DESCRIPTION

Stream restoration and stabilization efforts in the Peavine Creek watershed will focus on implementing targeted process-based restoration (PBR) projects in areas affected by channel incision, streambank erosion, concentrated runoff, limited floodplain connectivity, and excessive sediment transport. PBR activities will prioritize stream reaches and ephemeral drainages where site conditions indicate opportunities to improve hydrologic function, reduce erosion, increase water retention, and enhance riparian and aquatic habitat conditions.

Implementation will emphasize the use of low-tech PBR (LT-PBR) approaches that work with natural stream and floodplain processes to slow and disperse water, reconnect streams to adjacent floodplains, trap and retain sediment, improve groundwater recharge, and support recovery of riparian vegetation (Wheaton et al. 2019). Depending on site conditions, projects may be implemented using hand crews and small equipment (LT-PBR) or conventional construction equipment where larger-scale stabilization or access constraints require machine-based approaches.

Structural stabilization practices such as rock check structures will be implemented in areas experiencing concentrated runoff, unstable streambanks, active channel incision, or excessive sediment delivery. Practices such as rock grade controls, runoff control structures, and bank stabilization treatments may be used to reduce flow velocities, dissipate erosive energy, stabilize channels, promote sediment deposition, and support vegetation establishment (NRCS 2020a). These measures are expected to be particularly applicable in ephemeral drainages, steep-slope areas, and disturbed channels that rapidly convey runoff and sediment during storm events and spring snowmelt, such as Dry Canyon (Figure 4-4).

Stream stabilization and restoration management measures may include beaver dam analogs (BDAs), post-assisted log structures (PALS), rock check structures, large woody debris (LWD) features, willow staking, and small-scale runoff control structures (Table 4-3). Multiple measures may be implemented concurrently within a single restoration area to address watershed processes and restoration objectives in an integrated manner. The selection, combination, and placement of restoration measures will be based on site-specific conditions and restoration goals identified during field assessments. Considerations will include stream assessment results, geomorphic conditions, landownership and access constraints, stakeholder coordination, permitting requirements, and overall implementation feasibility. NDF conducted a field assessment in June 2026, to help identify potential restoration reaches; however, dense riparian vegetation and limited site access prevented a complete evaluation of the stream corridor. Prior to implementation, a restoration engineer or other qualified restoration practitioner will conduct additional field assessments to identify priority reaches, evaluate restoration opportunities, and determine the most appropriate stabilization and restoration techniques for each site.

APPROPRIATE SETTINGS

PBR is useful in depositional stream reaches with lower valley confinement relative to adjacent reaches, abandoned beaver complexes, riparian meadows, and gullies, with limited functionality.

SECONDARY BENEFITS

Increased long-term flood resilience in confined stream systems, protection of existing infrastructure, improved drought resilience, enhanced recreational and scenic values, and increased groundwater storage and late-season water availability.

LIMITATIONS

1. ***Conflicts:*** PBR design mimics natural processes to reconnect floodplains, groundwater, and seasonal flow regimes. Increasing storage and slowing flows can have impacts to downstream water users.
2. ***Scale:*** A single LT-PBR structure may have limited impact, but multiple structures installed in series creates measurable change. LT-PBR is most appropriate in headwater and small-order streams where access constraints may occur.
3. ***Quantifiable:*** Without robust monitoring, it can be difficult to quantify impacts and return on investments.
4. ***Flood Type:*** LT-PBR structures are smaller structures that are meant to fail during large storm events so as not to cause more erosion and larger flooding issues. PBR in larger, higher order streams require larger, more stable structures installed with heavy equipment to help mitigate flood and debris flows and reconnect streams with floodplains.

Table 4-3. Suite of Stream Stabilization and Restoration Management Measures Proposed for Implementation in the Peavine Creek Watershed

Activity ID	Management Measures*	Load Reductions
RES-01	BEAVER DAM ANALOGS (BDAS) Install low-tech BDA structures within suitable stream reaches to slow water velocities, trap sediment, reconnect floodplain surfaces, improve groundwater retention, and promote riparian vegetation recovery. Structures will be constructed using wooden posts, woody material, and other natural materials appropriate for site conditions.	Research is pending on initial load reductions for LT-PBR projects. According to a 2024 American Rivers report, "…many academic and agency researchers are currently implementing and studying the relatively new, low-cost LT-PBR methods to restore headwater streams to improve water, habitat, and drought and fire resilience" (American Rivers 2024).
RES-02	POST-ASSISTED LOG STRUCTURE (PALS) Install PALs in incised or unstable stream reaches to increase channel roughness, slow stream velocities, promote sediment deposition, reduce channel incision, and improve floodplain connectivity and habitat complexity.	
RES-03	ROCK CHECK STRUCTURES Construct rock check structures, including one-rock dams, rock rundowns, Zuni bowls, and similar features, within gullies, ephemeral drainages, and erosion-prone channels to reduce runoff velocity, stabilize channels, trap sediment, and support vegetation establishment.	
RES-04	LARGE WOODY DEBRIS (LWD) Install LWD structures within appropriate stream reaches to mimic natural wood accumulations, slow streamflow, retain sediment, increase channel complexity, promote riparian vegetation establishment, and improve aquatic habitat conditions.	
RES-05	WILLOW STAKING Implement willow staking and other revegetation treatments along unstable streambanks and disturbed riparian areas to stabilize soils, reduce erosion, improve shading, and support long-term riparian vegetation recovery. Vegetation management and selective thinning may also occur in areas where dense willow growth contributes to wildfire concerns or limits channel access.	
RES-06	SMALL-SCALE RUNOFF CONTROL STRUCTURES Install small-scale runoff control and grade stabilization structures within upland flow paths, ephemeral channels, and disturbed drainage areas to slow concentrated runoff, reduce erosion, trap sediment, and improve infiltration and watershed resilience.	

*Before selecting and implementing stabilization or PBR activities, a restoration engineer will need to conduct a stream assessment to identify appropriate locations and determine the most suitable practices for each site. One or more may need to be applied to each identified area.

Critical Areas

Several areas within the Peavine Creek watershed have been identified as priority implementation areas for stream restoration and stabilization activities due to channel incision, unstable streambanks, limited floodplain connectivity, concentrated runoff, and sediment transport concerns (Figure 4-4). Priority areas include portions of the lower main stem of Peavine Creek and ephemeral drainages such as Dry Canyon, where restoration actions may provide the greatest benefit to watershed function, sediment reduction, and riparian condition.

The lower main stem of Peavine Creek contains several reaches with evidence of channel incision, bank instability, limited floodplain interaction, and localized erosion. These conditions may contribute to increased flow velocities, downstream sediment transport, reduced late-season water retention, and degradation of riparian habitat conditions. Concerns regarding stream instability and erosion within these reaches were identified during the watershed tour conducted on November 13, 2025. A follow-up field assessment conducted by NDF in June 2026, identified several potential restoration reaches; however, dense riparian vegetation and limited site access prevented complete evaluation of all stream segments. Additional field assessments, vegetation clearing where needed, and geomorphic evaluations will be conducted prior to project implementation.

Dry Canyon, an ephemeral drainage, has also been identified as a priority implementation area due to concentrated runoff, active erosion, sediment transport, and localized channel instability. Although this channel is typically dry for much of the year, it can convey large volumes of water and sediment during storm events and spring runoff, contributing to downstream erosion, sediment deposition, and impacts to aquatic habitat and infrastructure.

Implementation within these critical areas will focus on slowing and dispersing runoff, stabilizing erosion-prone channels and streambanks, improving floodplain connectivity, increasing sediment retention, and promoting recovery of riparian vegetation. Many of the proposed LT-PBR techniques may be applied across perennial, intermittent, and ephemeral systems where site conditions are suitable.

Initial implementation activities will include stakeholder coordination, landowner outreach, site access coordination, stream condition assessments, restoration design, and prioritization of restoration reaches by a restoration engineer or qualified restoration practitioner. These efforts will be used to identify locations where restoration and stabilization measures are expected to provide the greatest long-term benefit to watershed function, water quality, and riparian health.

PROJECT PARTNERS

- NDF
- USFS
- NRCS
- Private Landowners

RELEVANT RESOURCES

- NRCS Field Office Technical Guide (NRCS 2026j)
- Nevada BMP Handbook – Erosion and Sediment Control (NDEP 2023)
- NRCS Critical Area Planting (NRCS 2022)
- Low-Tech Process-Based Restoration of Riverscapes Design Manual (Wheaton et al. 2019)

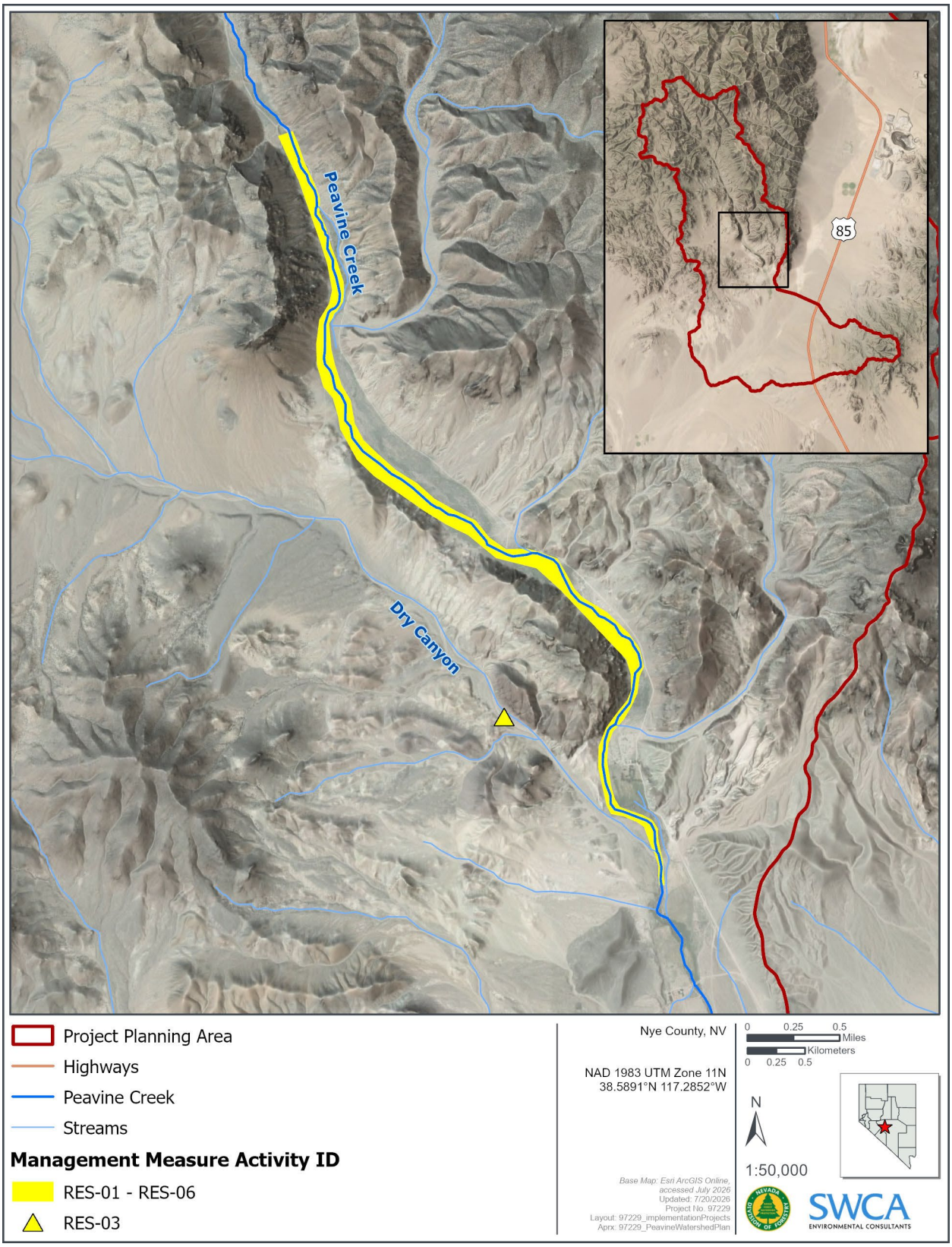


Figure 4-4. Critical areas targeted for LT-PBR management measure implementation.

4.1.4 Roadway and Access Improvements

TIME FRAME: 5–10 years

APPROACH DESCRIPTION

Roads, trails, stream crossings, and recreation access areas throughout the Peavine Creek watershed can influence runoff patterns, erosion, sediment delivery, and riparian condition. Poorly drained roads, unstable stream crossings, unmanaged recreation access routes, and concentrated use near streams may contribute sediment directly to Peavine Creek and its tributaries while disturbing streambanks and riparian vegetation. These impacts can become more pronounced during storm events, spring runoff, and periods of high seasonal recreation use when concentrated flows and disturbed soils increase erosion potential.

Implementation efforts will focus on identifying and improving roads, trails, stream crossings, drainage features, and recreation access areas that may be contributing to erosion or sediment delivery within the watershed (Table 4-4). Management measures will include road and trail drainage improvements, culvert replacement or installation, stabilization of stream crossings, erosion control treatments, trail maintenance, route management, and closure or rehabilitation of informal access routes where appropriate. These actions are intended to reduce sediment delivery, improve drainage and runoff management, protect riparian areas, maintain stable stream conditions, and support safe and sustainable recreation and land management access.

Initial implementation activities will include coordination among NDF, USFS, BLM, private landowners, and other stakeholders to identify transportation and recreation infrastructure that may be affecting watershed conditions. Field assessments will be conducted to identify roads, trails, culverts, stream crossings, and recreation access points associated with erosion, drainage issues, unstable crossings, concentrated runoff, or direct sediment delivery to streams. Based on assessment findings, priority sites will be identified for maintenance, stabilization, drainage improvements, or access management activities. Educational signage and outreach activities promoting responsible recreation, riparian protection, and sustainable access practices through information and outreach activities (see Section 4.4).

APPROPRIATE SETTINGS

Peavine campground, recreation areas, trails, unpaved roads, stream crossings, parking areas, and other access corridors located near streams, riparian areas, or erosion-prone slopes.

SECONDARY BENEFITS

Improve public safety, maintain reliable recreational and land management access, reduce long-term maintenance needs, improve drainage efficiency, and support sustainable recreation and watershed management activities.

LIMITATIONS

1. ***Ongoing Maintenance Needs:*** Roads, trails, and drainage features require periodic maintenance to remain effective, particularly following storm events or heavy seasonal use.
2. ***Recreation Pressure:*** High visitor use may continue to create localized impacts even after stabilization or access improvements are implemented.
3. ***Funding Constraints:*** Large-scale road or crossing improvements may require significant funding and coordination among multiple landowners or agencies.
4. ***Access and Terrain Limitations:*** Steep terrain, flood-prone areas, or limited equipment access may restrict implementation opportunities in some locations.

Table 4-4. Roadway and Access Improvement Measures Proposed for Implementation in the Peavine Creek Watershed

Activity ID	Management Measures	Load Reductions
REC-01	ROAD AND TRAIL DRAINAGE IMPROVEMENTS Implement drainage and erosion control improvements on roads and trails throughout the watershed to reduce concentrated runoff and sediment delivery to streams. Activities may include installation or replacement of culverts, rolling dips, water bars, armored drainage features, outsloping, road grading, and stabilization of eroded road segments and stream crossings.	Road and trail drainage improvements are widely documented to reduce concentrated runoff, erosion, and sediment delivery to streams when properly designed and maintained, although quantitative load reductions are highly site-specific (EPA 2015a; Swift 1988).
REC-02	TRAIL AND RECREATION ROUTE MANAGEMENT Assess, maintain, stabilize, reroute, or close trails and informal recreation access routes that are contributing to erosion, streambank disturbance, or sediment delivery to Peavine Creek and tributaries. Management activities may include trail drainage improvements, crossing stabilization, installation of barriers or signage, revegetation of disturbed areas, maintain livestock management infrastructure (including cattle guards, gates, fencing) and designation of sustainable recreation access points.	

Critical Areas

Several roads, recreation access areas, stream crossings, and trail corridors within the Peavine Creek watershed have been identified as priority implementation areas where erosion, drainage problems, unstable crossings, and unmanaged access may be contributing sediment to Peavine Creek and its tributaries (Figure 4-5). Priority implementation areas include portions of the USFS-managed road network, stream crossings associated with recreation and land management access, and high-use recreation areas near the Peavine Creek Campground and lower main stem corridor.

The Peavine Creek Campground and adjacent recreation access areas have been identified as priority management areas due to concentrated foot traffic, repeated stream access, informal trails, and seasonal increases in recreational use. These conditions may contribute to localized streambank instability, soil disturbance, vegetation loss, and erosion near the stream corridor, particularly during periods of high visitation and runoff. Implementation activities in this area may include stabilization of stream access points, closure or rehabilitation of informal trails, installation of signage or barriers, drainage improvements, and revegetation of disturbed riparian areas to manage recreation impacts while maintaining public access.

Several roads and stream crossings within USFS-managed portions of the watershed have also been identified as areas requiring assessment and potential improvement. Field observations identified road segments with erosion, washouts, inadequate drainage, unstable crossings, and locations where culvert installation, replacement, or repair may be needed to improve runoff conveyance and reduce sediment transport. Roads and crossings associated with ephemeral drainages and steep terrain will be prioritized where concentrated runoff contributes to erosion and downstream sediment delivery.

Trail and access management efforts will focus on identifying and addressing trails, informal routes, and access points contributing to erosion, concentrated runoff, sediment delivery, or riparian degradation. Where appropriate, management actions may include trail stabilization, drainage improvements, crossing repairs, route closures or reroutes, revegetation, and installation or maintenance of infrastructure such as cattle guards, fencing, gates, or barriers to better manage livestock and recreation access within sensitive areas.

Implementation within these critical areas will begin with stakeholder coordination, field assessments, prioritization of problem areas, and development of site-specific maintenance and stabilization recommendations by land managers and project partners.

PROJECT PARTNERS
- NDF
- USFS
- Nye County

RELEVANT RESOURCES
- Nevada BMP Handbook – Recreation BMPs (NDEP 2023)
- National BMPs for Water Quality Management on National Forest System Lands (USFS 2012)

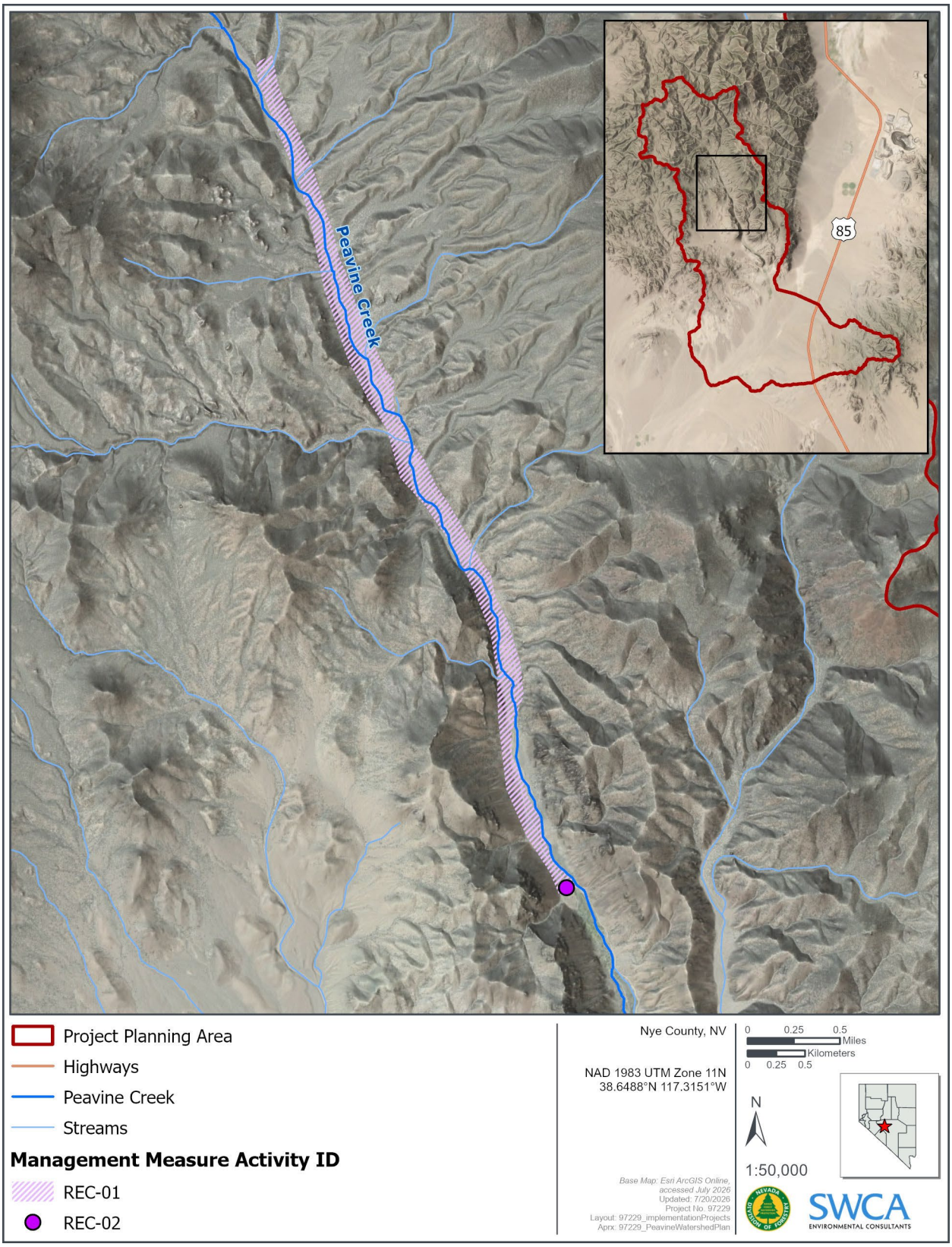


Figure 4-5. Critical areas targeted for roadway and access management measure implementation.

4.1.5 Fire Mitigation

TIME FRAME: 3–10 years

APPROACH DESCRIPTION

The upper Peavine Creek watershed plays an important role in regulating runoff, sediment production, and disturbance processes that affect downstream stream channels, irrigation infrastructure, riparian areas, and private lands. Conditions within these headwater areas influence flow timing, peak runoff, erosion rates, and sediment transport during storm events and spring snowmelt. As in much of the western United States, the watershed is also vulnerable to wildfire. High-severity wildfire can destabilize soils, increase erosion, and generate sediment pulses that degrade downstream watershed function, water quality, and aquatic habitat conditions.

Implementation efforts in the upper watershed will focus on improving watershed resilience and reducing the risk of high-severity wildfire and associated post-fire impacts through targeted fuels management. Preventive management actions in upland and headwater areas are intended to reduce wildfire intensity and spread while minimizing downstream effects such as increased runoff, debris flows, erosion, and sediment delivery.

Initial implementation activities will include coordination among NDF, USFS, and other stakeholders to identify priority treatment areas where wildfire risk and watershed vulnerability overlap. Field assessments and fuels evaluations will be conducted to identify elevated fuel loading, dense vegetation, erosion-prone slopes, high-risk road and trail corridors, and other areas where wildfire could substantially affect downstream conditions. Information from these assessments will be used to prioritize treatment areas and guide implementation planning.

Management measures may include pre-fire assessments and fuels reduction treatments along roads and access corridors (Table 4-5). These activities are intended to reduce wildfire severity, protect soils and vegetation, improve watershed resilience, and reduce the potential for post-fire erosion and sediment delivery to Peavine Creek and its tributaries.

APPROPRIATE SETTINGS

Forested uplands, recreation corridors, road networks, wildland-urban interface areas, and headwater portions of the watershed where fuel loading or erosion risk may affect watershed condition.

SECONDARY BENEFITS

Fire mitigation activities can improve forest and watershed health, protect infrastructure and downstream resources, reduce post-fire erosion risks, improve habitat conditions, and increase resilience to future disturbances.

LIMITATIONS

1. ***Wildfire Uncertainty:*** Fuel reduction treatments reduce wildfire severity but do not eliminate wildfire risk or prevent all post-fire impacts.
2. ***Treatment Location and Scale:*** Effective wildfire risk reduction requires treatment in the highest risk areas and typically requires spatial prioritization and coordination across landscapes and with multiple agencies and landowners.
3. ***Maintenance Requirements:*** Vegetation treatments require periodic maintenance to remain effective over time.
4. ***Access and Terrain Constraints:*** Steep terrain, dense vegetation, remote locations, and limited access may restrict implementation opportunities in portions of the upper watershed.

Table 4-5. Fire Mitigation Measures Proposed for Implementation in the Peavine Creek Watershed

Activity ID	BMPs	Load Reductions
FIRE-01	PRE-FIRE ASSESSMENTS Pre-fire assessments help identify areas where vegetation conditions or fuel loads may increase wildfire risk and threaten watershed stability. These assessments support prioritization of treatment areas and align with Nevada Forestry and Post-Fire Recovery BMP guidance (NDEP 2023) aimed at minimizing wildfire impacts on water quality and riparian systems	No direct pollutant load reductions are associated with these activities; however, the measures are intended to prevent or reduce the severity of catastrophic wildfires that could substantially degrade stream and riparian conditions. By reducing the potential for post-fire erosion, runoff, and sediment delivery, these actions are expected to provide indirect water quality benefits.
FIRE-02	FUELS MANAGEMENT Fuels management treatments reduce dense or hazardous vegetation that can contribute to high-severity wildfire. Reducing fuel loads helps limit wildfire intensity, protect soils and vegetation, and reduce the potential for post-fire erosion and sediment delivery to streams. Revegetation of disturbed treatment areas can stabilize soils, reduce erosion potential, and support recovery of native vegetation communities following fuels reduction or disturbance.	

Critical Areas

Upper watershed areas of Peavine Creek have been identified as priority implementation areas for wildfire mitigation and watershed protection, because conditions in these headwater areas strongly influence runoff, sediment production, erosion risk, and downstream watershed health (Figure 4-6).

Preliminary critical areas based on the NDF field visit in June 2026 include upland areas adjacent to roads, trails, stream corridors, and steep slopes where fuel loading, vegetation density, or erosion potential may increase wildfire risk and potential post-fire impacts. Current critical areas are generally based on buffers surrounding roads, trails, and stream corridors, with initial planning buffers extending approximately 100 feet from these features. These areas may be refined or modified as additional field assessments, fuels evaluations, and implementation planning are completed.

Current fuel loading, vegetation conditions, and erosion-prone areas have not been comprehensively mapped throughout the watershed and will require additional field verification prior to implementation. Initial implementation efforts will focus on stakeholder coordination, field assessments, fuels mapping, and identification of priority treatment areas where fuels reduction and vegetation management activities are expected to provide the greatest benefit for wildfire risk reduction, watershed protection, and long-term ecosystem resilience.

PROJECT PARTNERS
- NDF
- USFS

RELEVANT RESOURCES
- National BMPs for Water Quality Management on National Forest System Lands (USFS 2012)

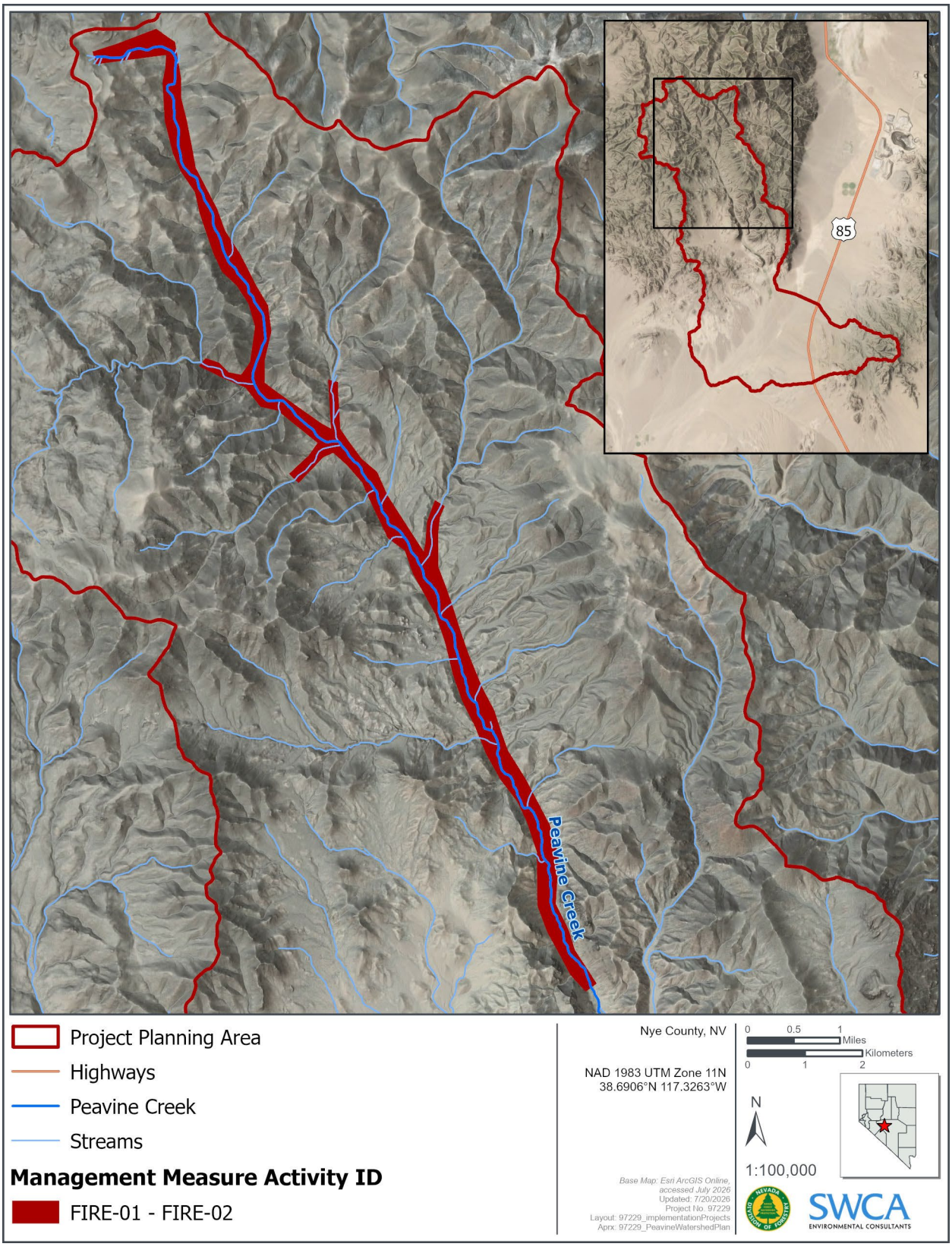


Figure 4-6. Critical areas targeted for fire mitigation management measure implementation.

4.2 Technical and Financial Assistance Needed

EPA ELEMENT

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Estimate the financial and technical assistance required to implement the plan, including installation and long-term operation and maintenance of implementation activities, information/education activities, monitoring, and evaluation. Identify the relevant implementing authorities and potential funding sources.

Successful implementation of the Peavine Creek WBP will depend on securing funding to support planning, design, implementation, monitoring, maintenance, outreach, and long-term project coordination. A variety of federal, state, local, and private funding programs may be available to support watershed restoration, agricultural BMP implementation, wildfire mitigation, stream restoration, road and trail improvements, monitoring, and habitat enhancement activities within the watershed.

Table 4-6 provides a preliminary summary of estimated implementation costs and potential funding sources associated with the management measures, information and outreach, and monitoring activities included in this plan. Because additional planning, site assessments, engineering, landowner coordination, and project design will be needed prior to implementation, the estimated costs presented in the table are intended to serve only as high-level planning estimates derived from relevant literature, published BMP cost information, and available program guidance. Actual project costs will vary depending on site conditions, project scale, permitting requirements, material needs, access constraints, and the total treatment area associated with each project.

Prior to applying for funding, individual projects may require additional scoping and design to better define implementation needs, treatment extents, and estimated budgets. Potential funding sources identified in Table 4-6 are preliminary and may change over time as program priorities, eligibility requirements, and funding availability are updated. Additional details regarding potential funding programs and funding source requirements are provided in Appendix B.

Table 4-6. Summary of Estimated Implementation Costs and Potential Funding Sources

Activity ID	Management Measure	Estimated Costs	Potential Funding Sources
AG-01	Nutrient and Grazing Management Plans	In house: $2,000–$11,000 per plan (NRCS 2020b); Consultant: $15,000–$30,000 per plan	• Agricultural Management Assistance (NRCS-01) • Conservation Stewardship Program (NRCS-03) • Environmental Quality Incentives Program (NRCS-04) • National Water Quality Initiative (NRCS-05) • Regional Conservation Partnership Program (NRCS-06) • Wetland Reserve Program (NRCS-07) • Conservation Innovation Grants (NRCS-08) • Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
AG-02	Rotational Grazing	$50–$150 per acre (NRCS 2024)	• Agricultural Management Assistance (NRCS-01) • Conservation Stewardship Program (NRCS-03) • Environmental Quality Incentives Program (NRCS-04) • Internal Funds (NDF-01)
AG-03	Manure Management	$5.03–$44.98 per acre (NRCS 2020b)	
AG-04	Drainage Management	$1,500–$5,000 per structure (NRCS 2024)	

Activity ID	Management Measure	Estimated Costs	Potential Funding Sources
AG-05	Off-Channel Watering Systems	$500–$2,500 per installation of gravity-fed livestock tanks (NRCS 2020b); $3,000–$15,000 per system (NRCS 2024)	• WaterSMART (BOR-01) • Agricultural Management Assistance (NRCS-01) • Conservation Stewardship Program (NRCS-03) • Regional Conservation Partnership Program (NRCS-06) • Wetland Reserve Program (NRCS-07) • America the Beautiful Challenge (NWF-01) • Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
AG-06	Stabilize Streambanks at Cattle Access Points	Approximately $100–$400 per linear foot (NRCS 2024)	• Agricultural Conservation Easement Program (NRCS-02) • Conservation Stewardship Program (NRCS-03) • Environmental Quality Incentives Program (NRCS-04) • Regional Conservation Partnership Program (NRCS-06) • Wetland Reserve Program (NRCS-07) • America the Beautiful Challenge (NWF-01) • Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01) • Landscape Scale Restoration Grants (NDF-04) • Conserve Nevada Program (NDC-01)
AG-07	Irrigation System Improvements	$2,000–$6,000 per acre (pop-up traveling sprinklers) (NRCS 2020b); $4,500–$12,000 per system (center pivot) (NRCS 2020b)	• WaterSMART (BOR-01) • Agricultural Management Assistance (NRCS-01) • Conservation Stewardship Program (NRCS-03) • Environmental Quality Incentives Program (NRCS-04) • Regional Conservation Partnership Program (NRCS-06) • Wetland Reserve Program (NRCS-07) • America the Beautiful Challenge (NWF-01) • Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
AG-08	Diversion/Canal Improvements	$25–$150 per linear foot (NRCS 2024)	
VEG-01	Invasive Plant Species Removal and Riparian Vegetation Thinning	Approximately $3,700 per acre (personal communication, Dan Eason, NDF 2026); $500–$5,000 per acre (DOI 2025)	• Conservation Stewardship Program (NRCS-03) • Environmental Quality Incentives Program (NRCS-04) • Regional Conservation Partnership Program (NRCS-06) • America the Beautiful Challenge (NWF-01) • Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01) • Landscape Scale Restoration Grants (NDF-04) • Conserve Nevada Program (NDC-01) • Invasive Plant Cost Share Program (NDA-01)
RES-01	Beaver Dam Analogs (BDAs)	Approximately $37.75–$45.30 per linear foot (NRCS 2024)	• Regional Conservation Partnership Program (NRCS-06) • America the Beautiful Challenge (NWF-01) • Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01) • Landscape Scale Restoration Grants (NDF-04)
RES-02	Post-Assisted Log Structures (PALS)	Approximately $37.75–$45.30 per linear foot (NRCS 2024)	
RES-03	Rock Check Structures	Approximately $75.48–$90.58 per ton (NRCS 2024)	
RES-04	Large Woody Debris (LWD)	Approximately $3.05 per square foot (NRCS 2024)	
RES-05	Willow Staking	Approximately $3.84–$14.03 per unit (NRCS 2024)	
RES-06	Small-Scale Runoff Control Structures	Approximately $949.07 per acre treated (NRCS 2024)	

Activity ID	Management Measure	Estimated Costs	Potential Funding Sources
REC-01	Road and Trail Drainage Improvements	Variable: $50–$1,600 per square foot depending on treatment (Water Research Foundation 2022); Approximately $5,000–$50,000 per project (USFS 2012)	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
REC-02	Trail and Recreation Route Management	Variable: $50–$1,600 per square foot depending on treatment (Water Research Foundation 2022); Approximately $2,000–$25,000 per project (USFS 2012)	
FIRE-01	Pre-Fire Assessments	Approximately $5–$50 per acre (DOI 2025)	• Conservation Stewardship Program (NRCS-03) • Environmental Quality Incentives Program (NRCS-04) • Regional Conservation Partnership Program (NRCS-06) • America the Beautiful Challenge (NWF-01) • Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01) • Conserve Nevada Program (NDC-01) • Invasive Plant Cost Share Program (NDA-01) • Western States Hazardous Fuels & Fire Managers Grant (NDF-02)
FIRE-02	Fuels Management	Approximately $3,700 per acre (personal communication, Dan Eason, NDF 2026); Approximately $300–$3,000 per acre (DOI 2025)	
INF-01	Implementation Progress Meetings	Staff time	• Internal Funds (NDF-01)
INF-02	Educational Signage	$1,000–$5,000 per sign (North Carolina Department of Environmental Quality 2017)	• Internal Funds (NDF-01) • Western States Hazardous Fuels & Fire Managers Grant (NDF-02) • State Nonpoint Source (Section 319) (NDEP-01) • Conservation Stewardship Program (NRCS-03) • Regional Conservation Partnership Program (NRCS-06) • Wetland Reserve Program (NRCS-07) • America the Beautiful Challenge (NWF-01)
INF-03	Funding Opportunities Education Materials	Staff time	• Internal Funds (NDF-01)
INF-04	Riparian Function Workshop	Staff time; $20–$45/person for food and drink (optional)	• Internal Funds (NDF-01)
INF-05	Irrigation Education	Staff time; $20–$45/person for food and drink (optional)	• Internal Funds (NDF-01) • Agricultural Management Assistance (NRCS-01) • Conservation Stewardship Program (NRCS-03) • Environmental Quality Incentives Program (NRCS-04)
INF-06	Cattle Grazing Education	Staff time	• Agricultural Management Assistance (NRCS-01) • Conservation Stewardship Program (NRCS-03) • Environmental Quality Incentives Program (NRCS-04) • Internal Funds (NDF-01) • Western States Hazardous Fuels & Fire Managers Grant (NDF-02)
INF-07	Stream Restoration Training	Staff time; To be determined whether external staff support will be needed for implementation.	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01) • Conservation Stewardship Program (NRCS-03) • Regional Conservation Partnership Program (NRCS-06) • Wetland Reserve Program (NRCS-07)

Activity ID	Management Measure	Estimated Costs	Potential Funding Sources
INF-08	Update Watershed Plan	Staff time or Hired Consultant ($15,000–$75,000+ depending on LOE)	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
MON-1	Livestock Baseline Inventory and Survey	Staff time	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
MON-2	Recreation Use and Visitation Monitoring	Staff time	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
MON-3	Baseline Water Quality Monitoring	Approximately $200–1,000 per sampling event per site including laboratory analysis, field equipment, and staff time; laboratory nutrient/TSS analyses approximately $15–$35 per parameter (EPA 2015b; Montana DEQ 2026)	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
MON-4	Streamflow and Stage Gauge Monitoring	Highly variable depending on the selected gauges. Anywhere from $100–$10,000 per gauge installation plus staff time for weekly monitoring.	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
MON-5	Channel Stability and Geomorphic Assessment	Approximately $5,000–$25,000 per assessment depending on stream length and survey intensity	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
MON-6	Legacy Mine Water Quality Assessment	Approximately $200–$1,000 per sampling event per site including laboratory analysis, field equipment, and staff time; laboratory nutrient/TSS analyses approximately 15–35 per parameter (EPA 2015b; Montana DEQ 2026)	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
MON-7	Pollutant Source Tracking Monitoring	Approximately $200–$1,000 per sampling event per site including laboratory analysis, field equipment, and staff time; laboratory nutrient/TSS analyses approximately $15–$35 per parameter (EPA 2015b; Montana DEQ 2026)	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
MON-8	BMP Effectiveness Monitoring	Approximately 5%–15% of total BMP implementation cost; $5,000–$50,000+ depending on project complexity	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)
MON-9	Beneficial Use Attainment Monitoring	Approximately $200–$1,000 per sampling event per site including laboratory analysis, field equipment, and staff time; laboratory nutrient/TSS analyses approximately $15–$35 per parameter (EPA 2015b; Montana DEQ 2026)	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)

Activity ID	Management Measure	Estimated Costs	Potential Funding Sources
MON-10	Long-Term Trend Monitoring	Approximately $200–$1,000 per sampling event per site including laboratory analysis, field equipment, and staff time; laboratory nutrient/TSS analyses approximately $15–$35 per parameter (EPA 2015b; Montana DEQ 2026)	• Internal Funds (NDF-01) • State Nonpoint Source (Section 319) (NDEP-01)

4.3 Information and Outreach Activities

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Include an information and outreach component that specifies the outreach actions supporting plan implementation. Information and outreach activities should promote adoption and long-term operation and maintenance of management practices and sustain stakeholder engagement.

Outreach and education are important components of successful watershed plan implementation because they help build the local support, coordination, and long-term stewardship needed to implement and sustain management measures over time. Outreach activities help translate the technical findings and recommendations of the watershed plan into practical, on-the-ground actions by increasing awareness of watershed issues, improving stakeholder communication, and providing information on available resources, funding opportunities, and BMPs. Education and outreach efforts are intended to complement implementation activities and support long-term watershed protection throughout the Peavine Creek watershed.

Table 4-7 summarizes the information and outreach activities proposed to support implementation of this watershed plan. These activities focus on stakeholder coordination, landowner education, technical workshops, public awareness, and recreation outreach related to watershed health, riparian protection, agricultural BMPs, irrigation improvements, grazing management, and PBR techniques. Additional details regarding project partners, implementation schedules, milestones, and performance indicators are provided in Table A-1 in Appendix A.

Table 4-7. Summary of Information and Outreach Activities

Activity ID	Implementation Activity
INF-01	**IMPLEMENTATION PROGRESS MEETINGS** Hold biannual meetings with watershed plan partners to track and plan implementation activities
INF-02	**EDUCATIONAL SIGNAGE** Install or improve educational signage at Peavine Creek Campground and other high-use recreation areas to encourage responsible recreation practices, discourage construction of temporary stream dams, promote riparian protection, maintain natural streamflow conditions, and highlight watershed implementation projects.
INF-03	**FUNDING OPPORTUNITIES EDUCATION MATERIALS** Develop landowner educational materials summarizing each year's funding opportunities for the various efforts outlined in this plan that are directly available to private landowners.

Activity ID	Implementation Activity
INF-04	**RIPARIAN FUNCTION WORKSHOP** Host a meeting or workshop to provide information on the proper function and condition of riparian areas to local stakeholders to increase awareness.
INF-05	**IRRIGATION EDUCATION** Host an event focused on educating area landowners about potential irrigation infrastructure improvements and irrigation best practices.
INF-06	**CATTLE GRAZING** Hold a meeting with area landowners to provide education on cattle grazing best practices.
INF-07	**STREAM RESTORATION** Host trainings or workshops focused on informing stakeholders about LT-PBR practices, benefits, and challenges.
INF-08	**UPDATE WATERSHED PLAN** Update the watershed plan and refine load reduction estimates within five years following implementation of the monitoring program and collection of additional water quality data.

* Strategies listed coincide with the strategies described in Table A-1 (see Appendix A).

4.4 Implementation Plan Schedule

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Provide a realistic implementation schedule for the implementation activities covering planning, design, installation, and operation and maintenance. Align this schedule with interim, measurable milestones to track whether implementation activities are being implemented effectively.

This watershed plan aims to implement watershed projects that lead to water quality improvements and address natural resource concerns across the watershed. A critical component of an implementation plan is a timely and realistic schedule. A defined schedule provides a way to measure the progress of individual implementation activities. Table 4-8 contains a schedule of the implementation activities outlined in the implementation plan. Some activities are scheduled annually; others will be ongoing on an opportunistic basis depending on resource concerns. In Table 4-8, the solid blue shading indicates activities that would take place during the implementation period, and the jagged blue shading indicates ongoing activities.

Table 4-8. Implementation Plan Schedule

Activity ID	Implementation Activity	Project Partners	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
INF-01	Implementation Progress Meetings	NDF, Private landowners, USFS, NDEP, NDOW											
INF-02	Educational Signage	NDF, NDEP, USFS											
INF-03	Funding Opportunities Education Materials	NDF, NDEP, NRCS											
INF-04	Riparian Function Workshop	NDF, NDEP, NDOW											
INF-05	Irrigation Education	NDA, NRCS, NDEP, NDF											
INF-06	Cattle Grazing Education	NDF, NRCS, NDA, Private landowners											
INF-07	Stream Restoration Training	NDF, NDEP, NDOW, USFS, NRCS											
INF-08	Update Watershed Plan												
AG-01	Nutrient and Grazing Management Plans	NDA, NRCS, Private landowners											
AG-02	Rotational Grazing	Private Landowners, NRCS, NDA											
AG-03	Manure Management	Private Landowners, NRCS, NDA											
AG-04	Drainage Management	Private Landowners, NRCS, NDA											
AG-05	Off-channel Watering Systems	NDA, NRCS, Private Landowners											
AG-06	Stabilize Streambanks at Cattle Access Points	NDA, NRCS, NDF, Private landowners											
AG-07	Irrigation System Improvements	NDA, NRCS, Private Landowners											
AG-08	Diversion/Canal Improvements	NDF, Department of Agriculture (NDA), NRCS, Private landowners											
VEG-01	Invasive Plan Species Removal and Riparian Vegetation Thinning	NDF, USFS, NRCS											
RES-01 – RES-06	LT-PBR	NDF, USFS, NRCS, Private Landowners											
REC-01	Road and Trail Drainage Improvements	USFS, NDF, Nye County											
REC-02	Trail and Recreation Route Management	USFS, NDF, NDEP											
FIRE-01	Pre-fire Assessments	NDF, USFS											
FIRE-02	Fuels management	NDF, USFS											

Activity ID	Implementation Activity	Project Partners	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
MON-1	Livestock Baseline Inventory and Survey	NDA, NDF, private landowners											
MON-2	Recreation Use and Visitation Monitoring	USFS, NDF											
MON-3	Baseline Water Quality Monitoring	NDEP, NDF, private landowners											
MON-4	Streamflow and Stage Gauge Monitoring	NDF, NDWR, NDEP, private landowners											
MON-5	Channel Stability and Geomorphic Assessment	NDF, private landowners											
MON-6	Legacy Mine Water Quality Assessment	NDEP, USFS, NDF											
MON-7	Pollutant Source Tracking Monitoring	NDEP, NDF											
MON-8	BMP Effectiveness Monitoring	NDEP, NDF											
MON-9	Beneficial Use Attainment Monitoring	NDEP											
MON-10	Long-Term Trend Monitoring	NDEP, NDF											

4.5 Milestones and Criteria to Measure Progress

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Interim measurable milestones for determining whether nonpoint source management measures or other control actions are being implemented.

Implementation progress will be tracked using interim milestones and performance indicators consistent with EPA's nine-element watershed planning guidance. Milestones are intended to measure whether management measures are being implemented over the 10-year planning period, while effectiveness monitoring will be used to evaluate changes in watershed conditions and water quality over time (see Section 4.6).

Implementation activities are organized into short-term (1–2 years), mid-term (3–5 years), and long-term (5+ years) phases and summarized in Table 4-9. In general, short-term efforts focus on stakeholder coordination, planning, outreach, assessments, and project development; mid-term efforts focus on completing assessments and initiating implementation projects; and long-term efforts focus on continued implementation, maintenance, monitoring, and adaptive management across priority areas of the watershed.

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A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards

Table 4-9 also identifies indicators that will be used to measure implementation progress. These indicators are intended to track measurable implementation outputs such as completion of management plans, installation of BMPs, infrastructure improvements, restoration treatments, outreach activities, and participation by landowners or stakeholders. Together, the milestones and indicators provide a framework for evaluating implementation progress, identifying barriers or data gaps, and adjusting priorities through adaptive management as implementation proceeds.

In addition to implementation tracking, watershed partners will evaluate effectiveness indicators to assess whether management measures are contributing to improvements in watershed conditions. Effectiveness indicators may include changes in sediment and nutrient delivery, streambank stability, riparian condition, streamflow characteristics, vegetation recovery, and other water quality or watershed function metrics described in the monitoring framework (Section 4-6). Estimated outcomes and load reduction information associated with individual management measures are summarized in the management measures tables in Section 4.1 where available.

Regular coordination among project partners and stakeholders will support ongoing review of milestones, monitoring results, implementation progress, and future project priorities throughout the implementation period.

Table 4-9. Milestones and Indicators to Measure Progress

Activity ID	Management Measure	Indicators to Measure Progress	Milestones		
			Short Term	Mid-Term	Long-Term
AG-01	Nutrient and Grazing Management Plans	Number of completed management plans	Complete approximately one to two plans	Implement Plans.	Update and maintain plans as needed
AG-02	Rotational Grazing	Percent (%) of participating grazing operations implementing rotational grazing	Identify priority operations	Approximately 50% participation	Approximately 100% participation
AG-03	Manure Management	Percent (%) of agricultural operations implementing manure management BMPs	Conduct outreach and site evaluations	Approximately 50% participation	Approximately 100% participation
AG-04	Drainage Management	Number of drainage improvement projects completed	Identify priority drainage issues	Implement approximately two projects	Implement additional projects watershed-wide
AG-05	Off-Channel Watering Systems	Number of off-channel watering systems installed	Identify priority locations	Install approximately two systems	Install approximately four systems
AG-06	Stabilize Streambanks at Cattle Access Points	Number of stabilized livestock access points	Complete site assessments	Stabilize approximately two access points	Stabilize approximately four access points
AG-07	Irrigation System Improvements	Percent (%) of irrigation systems upgraded	Identify priority systems	Approximately 50% upgraded	Approximately 75% upgraded
AG-08	Diversion/Canal Improvements	Percent (%) of diversion/canal infrastructure improved	Complete infrastructure assessments	Approximately 50% improved	Approximately 75% improved
VEG-01	Invasive Plant Species Removal and Riparian Vegetation Thinning	Acres treated or percent (%) of invasive vegetation removed	Treatment activities completed in 25% of priority areas	Treatment activities completed in 50% of priority areas	Treatment activities completed in 75% of priority areas
RES-01	Beaver Dam Analogs (BDAs)	Acres or linear feet of stream treated with LT-PBR.	Complete restoration assessments and planning.	Install LT-PBR structures	Expand implementation to additional reaches as needed.
RES-02	Post-Assisted Log Structures (PALS)				
RES-03	Rock Check Structures				
RES-04	Large Woody Debris (LWD)				
RES-05	Willow Staking				
RES-06	Small-Scale Runoff Control Structures				
REC-01	Road and Trail Drainage Improvements	Miles of road/trail improved or number of drainage features installed	Conduct infrastructure assessments	Complete priority drainage improvements	Continue maintenance and additional upgrades

Activity ID	Management Measure	Indicators to Measure Progress	Milestones		
			Short Term	Mid-Term	Long-Term
REC-02	Trail and Recreation Route Management	Number of trails/access points stabilized, rerouted, or closed	Identify unmanaged access routes	Stabilize priority recreation areas	Continue adaptive trail management
FIRE-01	Pre-Fire Assessments	Percent (%) of watershed assessed	Approximately 30%	Approximately 100%	-
FIRE-02	Fuels Management	Percent (%) of wildland fuels treated	Approximately 20%	Approximately 50%	Approximately 90%
INF-01	Implementation Progress Meetings	Number of stakeholder coordination meetings held annually and an attendee list to track engagement.	2 meetings held annually	Continue recurring meetings	Continue recurring meetings
INF-02	Recreation and Watershed Signage	Number of signs installed or updated	Develop signage materials	Install signage in priority recreation areas	Maintain and update signage as needed
INF-03	Landowner Funding Outreach Materials	Number of outreach materials distributed	Develop educational materials	Annual distribution to landowners	Continue annual updates and distribution
INF-04	Riparian Education Workshops	Number of workshops held	Plan workshop curriculum	Conduct approximately one workshop or event	Continue recurring workshops
INF-05	Irrigation BMP Workshops	Number of workshops or participants	Coordinate with landowners and agencies	Conduct approximately one workshop or event	Continue outreach and technical support
INF-06	Grazing Management Workshops	Number of workshops or participants	Develop outreach materials	Conduct approximately one workshop or event	Continue education efforts
INF-07	Process-Based Restoration Trainings	Number of trainings or workshops held	Identify training opportunities	Conduct approximately one training or workshop	Continue technical training opportunities
INF-08	Update Watershed Plan	Watershed Plan Updated	-	Plan Updated	-

4.6 Monitoring Program

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Evaluate the effectiveness of the implementation efforts over time, measured against the criteria established to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards.

Continued monitoring in the Peavine Creek watershed will be important for evaluating implementation efforts over time and tracking progress toward watershed goals. Data collected in the watershed can support multiple objectives, including filling key data gaps, evaluating trends, identifying pollutant sources, supporting future research, and assessing the effectiveness of implemented BMPs.
The monitoring plan (Activities MON-1 through MON-13) described in Table 4-10 is intended to provide

a practical framework for guiding environmental data collection throughout the watershed. In developing this framework, considerations included cost, practicality, available resources, implementation timeline, and existing information.

This monitoring plan should be used to guide watershed planners and stakeholders throughout plan implementation, but it should not be treated as a static, stand-alone document. Monitoring priorities and methods should be revisited periodically as watershed conditions, management needs, and available information change over time. Existing monitoring efforts in the watershed should continue alongside any future monitoring, and future efforts should build on available protocols, datasets, and coordination with agencies or partners already conducting sampling or related data collection in the area.

As part of this monitoring framework, watershed conditions may be evaluated using one or more complementary approaches, including chemical and physical water quality measurements, biological assessments, photo point monitoring, and indirect indicators of pollutant load reduction.

Table 4-10. Watershed Monitoring Program

Monitoring Objective	Activity ID	Project Partners	Type of Information Collected	Monitoring Questions	Locations	Parameters of Interest	Frequency and Duration
Gather baseline data	MON-1	Nevada Department of Agriculture (NDA), NDF, private landowners	Information survey	How many livestock are present in the watershed?	Private land across the watershed	Animal units	Conducted once, over the course of approximately 6 months
	MON-2	USFS, NDF	Information Survey	How many recreation visitors does the watershed see annually? How does seasonality impact visitation and usage?	Campground, USFS lands	Sediment, soil health, chemo-physical properties of water	Conducted annually
	MON-3	NDEP, NDF, private landowners	Water quality grab samples, field observations, photographs	What are water quality conditions in Peavine Creek main stem? Are tributaries contributing significant nutrient or sediment loads to Peavine Creek? How do concentrations vary upstream vs. downstream of the campground?	Peavine Creek near headwaters upstream of the campground and legacy mine features, the campground, upstream of privately owned parcels, beneath the campground, and downstream of final diversion before Peavine enters Big Smoky Valley	Water quality field measurements, flow, chemical and physical laboratory analysis	Quarterly, for 1 to 2 years, or at minimum, eight total samples
	MON-4	NDF, NDWR, NDEP, private landowners	Water quantity	Install stage gauges on selected private parcels along Peavine Creek for weekly monitoring.	Peavine Creek, Peavine tributaries	Water quantity	Conducted for 1–3 years, with measurements taken weekly
	MON-5	NDF, private landowners	Field observations, photographs, channel measurements	What is the extent of channelization, erosion, or other streambank stability concerns across the watershed? Where are areas of stream instability located?	Peavine Creek and tributaries	Channel morphology	Conducted once, over approximately 6 months

Monitoring Objective	Activity ID	Project Partners	Type of Information Collected	Monitoring Questions	Locations	Parameters of Interest	Frequency and Duration
	MON-6	NDEP, USFS, NDF	Water quality grab samples, field observations, photographs	To what extent does legacy mining impact water quality? Do water quality parameters indicate legacy pollutants are entering waterways? To what extent have contaminants from legacy mining impacts aquatic/riparian habitat?	Peavine Creek tributaries sited at or adjacent to historic mine areas, Peavine Creek main stem above and below tributaries with potential mining impacts	Metals, metalloids, acidity, sulfates	Conducted once, over the course of approximately 1 year, with ongoing water quality monitoring
Identify pollutant sources	MON-7	NDEP, NDF	Water quality grab samples, field observations, photographs	What are the parameters of concern identified during baseline sampling? What sources of the constituents exist within the watershed? Where along the creek do concentrations fluctuate?	Peavine Creek, tributaries	Determined from baseline water quality results	Quarterly, for 1–2 years
Evaluate effectiveness of watershed BMPs	MON-8	NDEP, NDF	Multiple indicator monitoring; photographs, field observations, water quality grab samples, flow measurements, soil samples, biological monitoring	Are the implementation activities proposed as part of the watershed plan effective at addressing resource concerns and reducing pollution in the watershed?	Implementation projects	Specified in detail in project-specific proposal	Before and after project implementation; frequency and duration specific to implemented BMPs
Assess beneficial use attainment	MON-9	NDEP	Water quality grab samples, streamflow	Are water bodies in the planning area supporting their designated beneficial uses?	Selected Peavine Creek monitoring locations	NDEP parameters for water quality assessment	Eight individual water quality sampling events
Evaluate long-term trends	MON-10	NDEP, NDF	Water quality grab samples, streamflow, photographs, field observations	How have watershed and water quality conditions changed over time? Based on this information, what trends can be projected into the future?	Selected Peavine Creek monitoring locations	NDEP parameters for water quality assessment	Semiannually, during irrigation season and non-irrigation season

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APPENDIX A

Implementation Activities Matrix

This appendix is meant to serve as a stand-alone road map for NDF and partners to support implementation of the Peavine Creek WBP.

The following information is listed in the implementation activities matrix (see Table A-1) for each of the activities:

- **Activity ID:** The activity ID is used to identify and differentiate activities outlined in the implementation plan.
- **Managemental Measure/Implementation Activity:** A description of the specific management measure or implementation activity to be carried out.
- **Suggested Project Partners:** Includes all participating organizations, with the proposed lead organization in **bold** text within each table.
- **Pollution source(s)**: The source(s) of pollution targeted by the activity.
- **Targeted pollutant(s):** Water quality parameters or pollutants addressed by each activity.
- **Estimated schedule:** The proposed timeline for implementation or monitoring. Activities designated as ongoing are anticipated to continue throughout the duration of the plan's time frame (10 years). See Section 4.3 for the full implementation schedule.
- **Indicator to measure progress:** Puts a unit or area measurement to implementation activities to ensure there is a way to track and measure progress. See Section 4.5 for more details.
- **Milestones:** Puts a measure of progress based on the indicators to track whether projects are being implemented on schedule.
- **Estimated costs:** Estimated costs to implement each activity based on literature values.
- **Possible funding:** Lists of possible grants and funding sources for each activity. Additional details on funding sources are provided in Table 4-2 in Section 4.2.
- **Expected Load Reductions/Results:** The anticipated load reductions or outcomes resulting from the implementation activity.

Table A-1. Implementation Activities Matrix

Activity ID	Management Measure/Implementation Activity	Project Partners	Source(s)	Targeted Pollutants	Estimated Schedule	Indicators to Measure Progress	Milestones			Estimated Costs	Possible Funding*	Expected Load Reductions/Results
							Short Term	Midterm	Long-Term			
Information and Outreach Activities												
INF-01	**IMPLEMENTATION PROGRESS MEETINGS** Hold bi-annual meetings with watershed plan partners to track and plan implementation activities	NDF, Private landowners, USFS, NDEP, NDOW	All	All	2026-2035; On-going	Number of stakeholder coordination meetings held annually and an attendee list to track engagement.	2 meetings held annually	Continue recurring meetings	Continue recurring meetings	Staff time	NDF-01	Improved stakeholder coordination and regular tracking of watershed plan implementation progress.
INF-02	**EDUCATIONAL SIGNAGE** Install educational signage at Peavine Campground to encourage recreation practices that support watershed health and highlight ongoing watershed projects.	NDF, NDEP, USFS	Recreation	Garbage, human waste, pet waste, nutrients, sediment	2028–2031	Number of signs installed or updated	Develop signage materials	Install signage in priority recreation areas	Maintain and update signage as needed	$1,000–$5,000 per sign (North Carolina Department of Environmental Quality 2017)	NDF-01, NDF-02, NDEP-01, NRCS-03, NRCS-06, NRCS-07, NWF-01	Increased public awareness and improved recreation practices that reduce impacts to the creek and support watershed health.
INF-03	**Funding Opportunities Education Materials** Develop annual educational materials for landowners summarizing funding opportunities available for implementing watershed plan activities.	NDF, NDEP, NRCS	All	All	2026–2036; ongoing	Number of outreach materials distributed	Develop educational materials	Annual distribution to landowners	Continue annual updates and distribution	Staff time	NDF-01	Increased landowner awareness and participation in funding programs that support watershed improvement projects.
INF-04	**RIPARIAN FUNCTION WORKSHOP** Host a workshop for local stakeholders on the function, condition, and importance of healthy riparian areas.	NDF, NDEP, NDOW	All	All	2026–2028	Number of workshops held	Plan workshop curriculum	Conduct approximately one workshop/event	Continue recurring workshops	Staff time; $20–$45/person for food and drink (optional)	NDF-01	Increased stakeholder awareness of riparian health and practices that support riparian protection and restoration.
INF-05	**IRRIGATION EDUCATION** Host an event focused on educating area landowners about potential irrigation infrastructure improvements and irrigation best practices.	NDA, NRCS, NDEP, NDF	Hydromodification, agriculture	DO, temperature, sediment, nutrients	2026–2028	Number of workshops or participants	Coordinate with landowners/ agencies	Conduct approximately one workshop/event	Continue outreach and technical support	Staff time; $20–$45/person for food and drink (optional)	NDF-01, NRCS-01, NRCS-03, NRCS-04	Enhance stakeholder collaboration and public engagement on watershed issues.
INF-06	**CATTLE GRAZING EDUCATION** Hold a meeting with area landowners to provide education on cattle grazing best practices.	NDF, NRCS, NDA, Private landowners	Agriculture	All	2026–2028	Number of workshops or participants	Develop outreach materials	Conduct approximately one workshop/event	Continue education efforts	Staff time	NRCS-01, NRCS-03, NRCS-04, NDF-01, NDF-02	Increased landowner awareness and adoption of grazing practices that protect riparian areas and water quality.
INF-07	**STREAM RESTORATION** Host trainings/workshops focused on informing stakeholders about low-tech process-based restoration practices, benefits, and challenges.	NDF, NDEP, NDOW, USFS, NRCS	Stream erosion	All	2026–2028	Number of trainings/workshop s held	Identify training opportunities	Conduct approximately one training/workshop	Continue technical training opportunities	Staff time; To be determined whether external staff support will be needed for implementation.	NDF-01, NDEP-01, NRCS-03, NRCS-06, NRCS-07	Increased stakeholder understanding and support for low-tech process-based restoration practices and their role in improving stream and riparian conditions.
INF-8	**UPDATE WATERSHED PLAN** Update the watershed plan and refine load reduction estimates within five years following implementation of the monitoring program and collection of additional water quality data.	NDF, NDEP	All	All	2031	Watershed Plan Updated	-	Plan Updated	–	Staff time or Hired Consultant ($15,000–$75,000+ depending on LOE)	NDF-01, NDEP-01	Updated pollutant loading to better identify areas of sources of pollution.
Non-Structural and Structural Management Measures												
AG-01	**NUTRIENT & GRAZING MANGEMENT PLAN** Develop a nutrient and grazing management plan to improve nutrient use efficiency and reduce pollutant loading from agricultural operations in the watershed and manage cattle grazing on private parcels within the watershed.	NDA, NRCS, Private landowners	Agriculture	Nutrients	2026–2029	Number of completed management plans	Complete approximately one to two plans	Implement Plans	Update and maintain plans as needed	In house: $2,000–$11,000 per plan (NRCS 2020b); Consultant: $15,000–$30,000 per plan	NRCS-01, NRCS-03, NRCS-04, NRCS-05, NRCS-06, NRCS-07, NRCS-08, NDF-01, NDEP-01	Improved nutrient management practices that reduce nutrient runoff to Peavine Creek. Improved grazing management that reduces livestock impacts to riparian areas and protects water quality in Peavine Creek.
AG-02	**ROTATIONAL GRAZING** Implement rotational or adaptive grazing systems throughout the watershed to improve pasture recovery, maintain vegetative cover, reduce soil disturbance, and limit prolonged livestock use of riparian areas and stream corridors.	Private Landowners, NRCS, NDA	Agriculture	Sediment, nutrients, temperature, DO, organic matter	2028–2036; ongoing	Percent (%) of participating grazing operations implementing rotational grazing	Identify priority operations	Approximately 50% participation	Approximately 100% participation	$50–$150 per acre (NRCS 2024)	NRCS-01, NRCS-03, NRCS-04, NDF-01	Nitrogen removal efficiency = 43%; phosphorus removal efficiency = 26% (EPA 2026c).

Activity ID	Management Measure/Implementation Activity	Project Partners	Source(s)	Targeted Pollutants	Estimated Schedule	Indicators to Measure Progress	Milestones			Estimated Costs	Possible Funding*	Expected Load Reductions/Results
							Short Term	Midterm	Long-Term			
AG-03	**MANURE MANGEMENT** Improve manure storage, handling, and land application practices at agricultural operations to reduce nutrient and bacteria runoff to nearby waterways while supporting appropriate reuse of manure as fertilizer.	Private Landowners, NRCS, NDA	Agriculture	Sediment, nutrients, temperature, DO, organic matter	2028–2036; ongoing	Percent (%) of agricultural operations implementing manure management BMPs	Conduct outreach and site evaluations	Approximately 50% participation	Approximately 100% participation	$5.03–$44.98 per acre (NRCS 2020)	NRCS-01, NRCS-03, NRCS-04, NDF-01	Nitrogen removal efficiency = 15%; phosphorus removal efficiency = 45% (EPA 2026c).
AG-04	**DRAINAGE MANAGEMENT** Install or improve drainage management features around pastures, barns, pens, corrals, and other agricultural areas to reduce runoff containing sediment, nutrients, and waste from entering streams and drainage channels within the watershed.	Private Landowners, NRCS, NDA	Agriculture	Sediment, nutrients, temperature, DO, organic matter	2028–2036; ongoing	Number of drainage improvement projects completed	Identify priority drainage issues	Implement approximately two projects	Implement additional projects watershed-wide	$1,500–$5,000 per structure (NRCS 2024)	NRCS-01, NRCS-03, NRCS-04, NDF-01	Nitrogen removal efficiency = 39%; phosphorus removal efficiency = 35% (EPA 2026c).
AG-05	**OFF-CHANNEL WATERING SYSTEMS** Install off-channel livestock watering systems, such as troughs or tanks, to reduce livestock concentration in streams and riparian areas and minimize impacts to streambanks and water quality.	NDA, NRCS, Private Landowners	Agriculture	Nutrients, sediment, organic matter, DO. temperature	2028–2031	Number of off-channel watering systems installed	Identify priority locations	Install approximately two systems	Install approximately four systems	$500–$2,500 per installation of gravity fed livestock tanks (NRCS 2020b); $3,00–$15,000 per system (NRCS 2024)	BOR-01, NRCS-01, NRCS-03, NRCS-06, NRCS-07, NWF-01, NDF-01, NDEP-01	Nitrogen removal efficiency = 18%; phosphorus removal efficiency = 13%; sediment removal efficiency = 20% (EPA 2026c).
AG-06	**STABILIZE STREAMBANKS AT CATTLE ACCESS POINTS** Stabilize designated livestock access points along streams on private lands using appropriate erosion control and bank stabilization measures to better manage cattle access and reduce sediment, nutrient, and bank erosion impacts.	NDA, NRCS, NDF, Private landowners	Agriculture	Sediment, nutrients, temperature, organic matter, DO, biological contaminants	2029–2032	Number of stabilized livestock access points	Complete site assessments	Stabilize approximately two access points	Stabilize approximately four access points	Approximately $100–400 per linear foot (NRCS 2024)	NRCS-02, NRCS-03, NRCS-04, NRCS-06, NRCS-07, NWF-01, NDF-01, NDEP-01, NDF-04, NDC-01	Nitrogen removal efficiency = 75%; phosphorus removal efficiency = 75%; sediment removal efficiency = 75% (EPA 2026c).
AG-07	**IRRIGATION SYSTEM IMPROVEMENTS** Upgrade irrigation infrastructure, including conversion of flood irrigation systems to more efficient sprinkler or pivot systems where feasible, to improve water use efficiency and reduce excess runoff and return flows.	NDA, NRCS, Private Landowners	Hydromodification, agriculture	DO, temperature, sediment, nutrients	2030–2033	Percent (%) of irrigation systems upgraded	Identify priority systems	Approximately 50% upgraded	Approximately 75% upgraded	$2,000–$6,000 per acre (pop-up traveling sprinklers) (NRCS 2020b); $4,500–$12,000 per system (center pivot) (NRCS 2020b)	BOR-01, NRCS-01, NRCS-03, NRCS-04, NRCS-06, NRCS-07, NWF-01, NDF-01, NDEP-01	Improved irrigation efficiency and reduced water losses.
AG-08	**DIVERSION/CANAL IMPROVEMENTS** Repair, stabilize, or upgrade diversions, canals, culverts, and stream crossings throughout the watershed to reduce water loss, improve conveyance efficiency, and minimize erosion and sediment delivery to Peavine Creek.	NDF, Department of Agriculture (NDA), NRCS, Private landowners	Hydromodification, agriculture	DO, temperature, sediment, nutrients	2031–2036	Percent (%) of diversion/canal infrastructure improved	Complete infrastructure assessments	Approximately 50% improved	Approximately 75% improved	$25–$150 per linear foot (NRCS 2024)	BOR-01, NRCS-01, NRCS-03, NRCS-04, NRCS-06, NRCS-07, NWF-01, NDF-01, NDEP-01	Improved diversion and water control systems improve transport efficiency, reduce instream temperatures, improve irrigation efficiency, and improve understanding of water quantity.

Activity ID	Management Measure/Implementation Activity	Project Partners	Source(s)	Targeted Pollutants	Estimated Schedule	Indicators to Measure Progress	Milestones			Estimated Costs	Possible Funding*	Expected Load Reductions/Results
							Short Term	Midterm	Long-Term			
VEG-01	**INVASIVE PLAN SPECIES REMOVAL** Identify, prioritize, and implement invasive plant species treatment projects within riparian corridors and adjacent upland areas of the Peavine Creek watershed. Management actions may include mechanical, chemical, or manual removal of invasive vegetation such as tamarisk, Russian olive, and other non-native species using methods appropriate for site conditions. Following treatment, revegetate disturbed areas with native riparian species where appropriate to improve riparian function, stabilize streambanks and soils, reduce erosion, enhance habitat quality, and increase long-term resistance to reinvasion. **RIPARIAN VEGETATION THINNING** Implement selective thinning and vegetation management projects in areas with dense or overgrown riparian vegetation to improve riparian health, maintain stream function, reduce hazardous fuel loads, and support healthy native plant community structure within the Peavine Creek watershed.	NDF, USFS, NRCS	Biological integrity, stream erosion	Sediment, temperature, organic matter, DO, flow effects	2026–2036; ongoing	Acres treated or maintained, or percent (%) of invasive vegetation removed	Treatment activities completed in 25% of priority areas	Treatment activities completed in 50% of priority areas	Treatment activities completed in 75% of priority areas	Approximately $3,700 per acre (NDF 2026); $500–$5,000 per acre (DOI 2025)	NRCS-03, NRCS-04, NRCS-06, NWF-01, NDF-01, NDEP-01, NDF-4, NDC-01, NDA-01	Improved hydrologic function, increased water availability.
RES-01	**BEAVER DAM ANALOGS (BDAS)** Install low-tech BDA structures within suitable stream reaches to slow water velocities, trap sediment, reconnect floodplain surfaces, improve groundwater retention, and promote riparian vegetation recovery. Structures will be constructed using wooden posts, woody material, and other natural materials appropriate for site conditions.	NDF, USFS, NRCS, Private Landowners	Stream erosion	Sediment, temperature, flow effects, DO	2028–2036	Acres or linear feet of stream treated with LT-PBR.	Complete restoration assessments and planning.	Install LT-PBR structures	Expand implementation to additional reaches as needed.	Approximately $37.75–$45.30 per linear foot (NRCS 2024)	NRCS-06, NWF-01, NDF-01, NDEP-01, NDF-04	Increased floodplain connectivity, reduced stream velocities and channel erosion, improved groundwater retention, enhanced riparian vegetation establishment, and reduced downstream sediment transport.
RES-02	**POST-ASSISTED LOG STRUCTURE (PALS)** Install PALs in incised or unstable stream reaches to increase channel roughness, slow stream velocities, promote sediment deposition, reduce channel incision, and improve floodplain connectivity and habitat complexity.	NDF, USFS, NRCS, Private Landowners	Stream erosion	Sediment, temperature, flow effects, DO	2028–2036	Acres or linear feet of stream treated with LT-PBR.	Complete restoration assessments and planning.	Install LT-PBR structures	Expand implementation to additional reaches as needed.	Approximately $37.75–$45.30 per linear foot (NRCS 2024)	NRCS-06, NWF-01, NDF-01, NDEP-01, NDF-04	Reduced channel incision and bank instability, increased sediment deposition and floodplain interaction, improved aquatic habitat complexity, and enhanced stream resilience during high-flow events.
RES-03	**ROCK CHECK STRUCTURES** Construct rock check structures, including one-rock dams, rock rundowns, Zuni bowls, and similar features, within gullies, ephemeral drainages, and erosion-prone channels to reduce runoff velocity, stabilize channels, trap sediment, and support vegetation establishment.	NDF, USFS, NRCS, Private Landowners	Stream erosion	Sediment, temperature, flow effects, DO	2028–2036	Acres or linear feet of stream treated with LT-PBR.	Complete restoration assessments and planning.	Install LT-PBR structures	Expand implementation to additional reaches as needed.	Approximately $75.48–$90.58 per ton (NRCS 2024)	NRCS-06, NWF-01, NDF-01, NDEP-01, NDF-04	Reduced runoff velocity and gully erosion, increased sediment retention and infiltration, stabilized ephemeral drainages, and improved vegetation establishment in treated areas.
RES-04	**LARGE WOODY DEBRIS (LWD)** Install LWD structures within appropriate stream reaches to mimic natural wood accumulations, slow streamflow, retain sediment, increase channel complexity, promote riparian vegetation establishment, and improve aquatic habitat conditions.	NDF, USFS, NRCS, Private Landowners	Stream erosion	Sediment, temperature, flow effects, DO	2028–2036	Acres or linear feet of stream treated with LT-PBR.	Complete restoration assessments and planning.	Install LT-PBR structures	Expand implementation to additional reaches as needed.	Approximately $3.05 per square foot (NRCS 2024)	NRCS-06, NWF-01, NDF-01, NDEP-01, NDF-04	Increased channel complexity and habitat diversity, reduced stream velocities and localized erosion, improved sediment retention, and enhanced riparian and aquatic habitat conditions
RES-05	**WILLOW STAKING** Implement willow staking and other revegetation treatments along unstable streambanks and disturbed riparian areas to stabilize soils, reduce erosion, improve shading, and support long-term riparian vegetation recovery. Vegetation management and selective thinning may also occur in areas where dense willow growth contributes to wildfire concerns or limits channel access.	NDF, USFS, NRCS, Private Landowners	Stream erosion	Sediment, temperature, flow effects, DO	2028–2036	Acres or linear feet of stream treated with LT-PBR.	Complete restoration assessments and planning.	Install LT-PBR structures	Expand implementation to additional reaches as needed.	Approximately $3.84–$14.03 per unit (NRCS 2024)	NRCS-06, NWF-01, NDF-01, NDEP-01, NDF-04	Stabilized streambanks and disturbed riparian soils, reduced erosion and sediment delivery, increased riparian shading and vegetation cover, and improved long-term riparian function and habitat quality.

Activity ID	Management Measure/Implementation Activity	Project Partners	Source(s)	Targeted Pollutants	Estimated Schedule	Indicators to Measure Progress	Milestones			Estimated Costs	Possible Funding*	Expected Load Reductions/Results
							Short Term	Midterm	Long-Term			
RES-06	**SMALL-SCALE RUNOFF CONTROL STRUCTURES** Install small-scale runoff control and grade stabilization structures within upland flow paths, ephemeral channels, and disturbed drainage areas to slow concentrated runoff, reduce erosion, trap sediment, and improve infiltration and watershed resilience.	NDF, USFS, NRCS, Private Landowners	Stream erosion	Sediment, temperature, flow effects, DO	2028–2036	Acres or linear feet of stream treated with LT-PBR.	Complete restoration assessments and planning.	Install LT-PBR structures	Expand implementation to additional reaches as needed.	Approximately $949.07 per acre treated (NRCS 2024)	NRCS-06, NWF-01, NDF-01, NDEP-01, NDF-04	Reduced concentrated runoff and erosion in upland and disturbed drainage areas, increased infiltration and sediment retention, improved slope and drainage stability, and enhanced overall watershed resilience.
REC-01	**ROAD AND TRAIL DRAINAGE IMPROVEMENTS** Implement drainage and erosion control improvements on roads and trails throughout the watershed to reduce concentrated runoff and sediment delivery to streams. Activities may include installation or replacement of culverts, rolling dips, water bars, armored drainage features, outsloping, road grading, and stabilization of eroded road segments and stream crossings.	USFS, Nye County, NDF	Recreation, stream erosion	Sediment, temperature, DO, flow effects, hydrocarbons	2028–2036	Miles of road/trail improved or number of drainage features installed	Conduct infrastructure assessments	Complete priority drainage improvements	Continue maintenance and additional upgrades	Variable: $50–$1,600 per square foot depending on treatment (Water Research Foundation 2022); Approximately $5,000–$50,000 per project (USFS 2012)	NDF-01, NDEP-01,	Road and trail drainage improvements are widely documented to reduce concentrated runoff, erosion, and sediment delivery to streams when properly designed and maintained, although quantitative load reductions are highly site-specific (Swift, L. W., Jr. 1988; EPA 2025).
REC-02	**TRAIL AND RECREATION ROUTE MANAGEMENT** Assess, maintain, stabilize, reroute, or close trails and informal recreation access routes that are contributing to erosion, streambank disturbance, or sediment delivery to Peavine Creek and tributaries. Management activities may include trail drainage improvements, crossing stabilization, installation of barriers or signage, revegetation of disturbed areas, maintain livestock management infrastructure (including cattle guards, gates, fencing) and designation of sustainable recreation access points.	USFS, NDF	Recreation, stream erosion	Sediment, temperature, DO, flow effects	2028–2036	Number of trails/access points stabilized, rerouted, or closed	Identify unmanaged access routes	Stabilize priority recreation areas	Continue adaptive trail management	Variable: $50–$1,600 per square foot depending on treatment (Water Research Foundation 2022); Approximately $2,000–$25,000 per project (USFS 2012)	NRCS-06, NWF-01, NDF-01, NDEP-01	Road and trail drainage improvements are widely documented to reduce concentrated runoff, erosion, and sediment delivery to streams when properly designed and maintained, although quantitative load reductions are highly site-specific (Swift, L. W., Jr. 1988; EPA 2025).
FIRE-01	**PRE-FIRE ASSESSMENTS** Pre-fire assessments help identify areas where vegetation conditions or fuel loads may increase wildfire risk and threaten watershed stability. These assessments support prioritization of treatment areas and align with Nevada Forestry and Post-Fire Recovery BMP guidance (NDEP 2023) aimed at minimizing wildfire impacts on water quality and riparian systems	NDF, USFS	Erosion	Sediment, nutrients, temperature, organic matter, DO, flow effects	2026–2031	Percent (%) of watershed assessed	Approximately 30%	Approximately 100%	–	Approximately $5–$50 per acre (DOI 2025)	NRCS-03, NRCS-04, NRCS-06, NWF-01, NDF-01, NDEP-01, NDC-01, NDA-01	Identification of priority areas for fuels reduction to lower wildfire risk and protect watershed resources.
FIRE-02	**FUELS MANAGEMENT** Fuels management treatments reduce dense or hazardous vegetation that can contribute to high-severity wildfire. Reducing fuel loads helps limit wildfire intensity, protect soils and vegetation, and reduce the potential for post-fire erosion and sediment delivery to streams. Revegetation of disturbed treatment areas can stabilize soils, reduce erosion potential, and support recovery of native vegetation communities following fuels reduction or disturbance	NDF, USFS	Erosion	Nutrients, sediment, organic matter, temperature, DO, flow effects	2026–2036; ongoing	Percent (%) of wildland fuels treated	Approximately 20%	Approximately 50%	Approximately 90%	Approximately $3,700 per acre (NDF 2026); Approximately $300–$3,000 per acre (DOI 2025)	NRCS-03, NRCS-04, NRCS-06, NWF-01, NDF-01, NDEP-01, NDC-01, NDA-01, NDF-02	Improved hydrologic function and wildfire resilience.

*For more information on each funding source see Appendix B.

APPENDIX B

Funding Sources Information

Table B-1. Funding Sources for Projects

Funding ID	Funding Agency	Grant/ Funding Program	Description	Requirements	Application Period	Description of Funding Amounts and Timing of Availability
U.S. Bureau of Reclamation (BOR)-01	BOR	WaterSmart	Provides financial assistance to water managers for projects that seek to conserve and use water more efficiently, implement renewable energy, investigate and develop water marketing strategies, mitigate conflict risk in areas at a high risk of future water conflict, and accomplish other benefits that contribute to sustainability in the western United States (U.S. Bureau of Reclamation 2026).	Applicants must be located in the western United States or U.S. territories (BOR 2026).	Ongoing.	Up to $500,000 for projects to be completed within 2 years.
NRCS-01	NRCS	Agricultural management assistance (AMA)	A program that provides funding for production diversification and resource conservation practices that could improve water quality; resource conservation practices include soil erosion control, integrated pest management, and organic farming (NRCS 2026a).	Producers must • be engaged in livestock or agricultural production; • have an interest in the farming operation associated with the land being offered for AMA enrollment; • have control of the land for the term of the proposed contract; • be in compliance with the provisions for protecting the interests of tenants and sharecroppers, including the provisions for sharing AMA payments on a fair and equitable basis; and • be within appropriate payment limitation requirements (NRCS 2026a).	Ongoing; contact your local NRCS office.	AMA provides financial assistance up to 75% of the cost of installing conservation practices. Total AMA payments shall not exceed $50,000 per participant for any fiscal year (NRCS 2026a).

Funding ID	Funding Agency	Grant/ Funding Program	Description	Requirements	Application Period	Description of Funding Amounts and Timing of Availability
NRCS-02	NRCS	Agricultural Conservation Easement Program (ACEP)	The ACEP comprises two components: 1) to help Tribal landowners, land trusts, and other entities protect croplands and grasslands on working farms by limiting non-agricultural activities through conservation easements and 2) to help landowners protect and restore wetlands previous impacted by agricultural use (NRCS 2025b).	Eligible applications must meet the requirement for farm bill programs under the NRCS (NRCS 2025b).	Ongoing; contact your local NRCS office.	NRCS will pay 50% of development value, with the other 50% coming from land trusts or other partners (NRCS 2025b).
NRCS-03	NRCS	Conservation Stewardship Program	A program that works with farmers to reward actions taken to address natural resource concerns in a comprehensive manner and offers compensation for completing additional enhancements (NRCS 2026b).	Eligible lands include private agricultural lands, agricultural Tribal lands, nonindustrial private forestland, farmsteads, associated agricultural lands, and public land that is under the control of the applicant and part of an existing operation. Farmland that is being cleared or prepared for future farming is not eligible. Applicants may include individuals, legal entities, joint operations, or Tribes that own or rent and currently manage land for agricultural or forest production (NRCS 2026b).	Ongoing; contact your local NRCS office.	Annual funds or supplemental funds are available to support conservation practices on farmland (NRCS 2026b).
NRCS-04	NRCS	Environmental Quality Incentives Program	Voluntary program where agricultural producers can receive funding for structural and management practices to improve water quality, reduce soil erosion and sedimentation, improve created wildlife habitat, and mitigate drought (NRCS 2026c).	Applicants must own or manage the land for agricultural commodities that could include cropland, rangeland, pastureland, private forestland, or ranchlands (NRCS 2026c).	Ongoing; contact your local NRCS office.	Funding amounts for all NRCS programs (except ACEP) vary from year to year but are based on set payment rates for each individual practice. Interested parties should contact their local NRCS office for application deadlines and payment rates.

Funding ID	Funding Agency	Grant/ Funding Program	Description	Requirements	Application Period	Description of Funding Amounts and Timing of Availability
NRCS-05	NRCS	National Water Quality Initiative (NWQI)	Program to financially support producers implementing conservation and management practices to reduce nutrient-rich runoff; example projects eligible for funding through this grant include cover crops, filter strips, and tailwater recovery systems (NRCS 2026d).	The land included in the application must be within an NRCS-designated NWQI watershed. The list of NWQI-designated watersheds is updated annually and is available on the NRCS website (NRCS 2026d).	Ongoing; contact your local NRCS office.	Funding amounts for all NRCS programs (except ACEP) vary from year to year but are based on set payment rates for each individual practice. Interested parties should contact their local NRCS office for application deadlines and payment rates.
NRCS-06	NRCS	Regional Conservation Partnership Program	Program that partners with producers to increase the restoration and sustainable use of soil, water, wildlife, and related natural resources on watershed scales (NRCS 2026e).	Applicants can be agriculture and silviculture associations, non-government organizations (NGOs), Tribes, state and local governments, conservation districts, and universities (NRCS 2026e).	Ongoing; contact your local NRCS office.	Funding amounts for all NRCS programs (except ACEP) vary from year to year but are based on set payment rates for each individual practice. Interested parties should contact their local NRCS office for application deadlines and payment rates.
NRCS-07	NRCS	Wetland Reserve Program	Voluntary program that provides technical and financial assistance to eligible landowners to address wetland, wildlife habitat, soil, water, and related natural resources concerns on private lands in an environmentally beneficial and cost-effective manner. (NRCS 2026f).	Lands that are eligible include wetlands farmed under natural conditions; farmed wetlands; prior converted cropland; farmed wetland pasture; certain lands that had the potential to become a wetland as a result of flooding; rangeland, pasture, or forest production lands where the hydrology had been significantly degraded and could be restored; riparian areas that linked protected wetlands; lands adjacent to protected wetlands that contributed significantly to wetland functions and values; and wetlands that had previously been restored under a local, state, or federal program that need long-term protection (NRCS 2026f).	Ongoing; contact your local NRCS office.	Funds differ depending on the length of easement a landowner agrees to. Interested parties should contact their local NRCS office for application deadlines and payment rates.

Funding ID	Funding Agency	Grant/ Funding Program	Description	Requirements	Application Period	Description of Funding Amounts and Timing of Availability
NRCS-08	NRCS	Conservation Innovation Grants	Program that targets funding for individual producers and smaller organizations that may not compete well on larger state and federal grants (categories of projects are selected each year, and updated categories can be found on the NRCS website); example categories include soil health, water optimization technologies, and urban farming technologies (NRCS 2026g).	Eligible applicants include state and local governments, NGOs, eligible private businesses, and individuals (NRCS 2026g).	Variable from year to year, but generally March through April.	It is anticipated that a total amount of up to $200,000 will be available to fund multiple 1- to 3-year projects. Single projects may be eligible to receive $20,000–$200,000 in funding (NRCS 2026g).
National Wildlife Federation (NWF)-01	NWF	America the Beautiful Challenge (NWF 2026)	A public-private grant program for locally led ecosystem restoration projects that invest in watershed restoration, resilience, equitable access, workforce development, corridors and connectivity, and collaborative conservation consistent with the America the Beautiful initiative.	Projects focus on at least one of the following core areas: • Conserving and restoring rivers, coasts, wetlands, and watersheds • Conserving and restoring forests, grasslands, and other important ecosystems that serve as carbon sinks • Connecting and reconnecting wildlife corridors, large landscapes, watersheds, and seascapes • Improving ecosystem and community resilience to coastal flooding, drought, and other climate-related threats • Expanding access to the outdoors, particularly in underserved communities State government agencies, U.S. territories, and Tribal Nations are eligible to apply for all grant categories. Nonprofit 501(c) organizations, local governments, municipal governments, and educational institutions are eligible to apply for grants in categories: (3) Sentinel Landscape, (4)	Variable from year to year but applications are typically due in July and awards are announced in November.	1. Implementation Grants: Awards range from $1 to $5 million, and landscape-scale restoration requests over $5 million will be considered on a case-by-case basis. 2. Planning Grants: Awards range from $200,000 to $2 million and are contingent upon awards from the U.S. Department of the Interior. 3. Sentinel Landscape Grants: Awards range from $250,000 to $1.5 million and are contingent upon awards by the Department of Defense. 4. National Forest grants: Awards range from $250,000 to $1.5 million and are contingent upon awards by the USFS. 5. Private Forests, Rangeland, and Farmland Grants: Awards range from $200,000 to $500,000 and are contingent upon awards by the NRCS. Cost sharing: For states, the federal cost share is 90%, and states must provide 10% of costs, of which at least 2.5% must be cash. For Tribal Nations and territories, the federal cost share

Funding ID	Funding Agency	Grant/ Funding Program	Description	Requirements	Application Period	Description of Funding Amounts and Timing of Availability
				National Forest, and (5) Private Forests and Farmland.		is 97%, and they must provide 3% of costs, of which at least 0.75% must be cash. The cost share is waived for Tribes fully covered by partnerships with Native Americans in Philanthropy and waived for territories in accordance with U.S. Department of the Interior legal interpretation.
NDF-01	NDF	Internal Funds	Supports forestry management efforts.	Not applicable (N/A)	N/A	N/A
NDF-02	NDF	Western States Hazardous Fuels and Fire Managers Grant	**Hazardous Fuels-Community Protection Grant** – These grant funds support hazardous fuels reduction projects and restoration of fire-adapted ecosystems. Projects must be located on private property that is adjacent to USFS lands (NDF 2026b). **Western State Fire Managers Grant** – These grants will provide funds to mitigate wildfire risks within the Wildland-Urban Interface, with emphasis on hazardous fuels reduction, community outreach, wildfire risk assessment, planning, and monitoring (NDF 2026b).	Eligible applicants include state and local agencies, Tribes, nonprofit organizations, companies, homeowners associations and educational institutions (NDF 2026b).	Ongoing; preliminary proposals accepted year-round.	Projects that use approximately $205,000–$290,000 in grant funds are desired. If funded, payments are on a reimbursement basis (NDF 2026b).
NDF-03	NDF	Conservation Education and Outreach Grant	Supports conservation education materials and opportunities that help communities make informed land management decisions and advance conservation and restoration goals identified in the Nevada Forest, Range, and Watershed Action Plan (NDF 2026c).	Eligible applicants include state agencies, local agencies, Tribes, nonprofits, and educational institutions. Applicants are expected to provide 20% non-federal match; indirect costs may not exceed the 2 Code of Federal Regulations (CFR) 200 de minimis rate of 15% unless the applicant has a negotiated indirect cost rate agreement (NDF 2026c).	Applications are accepted annually from January through April. In 2026, the Notice of Intent to Apply deadline was March 1, 2026 (NDF 2026c).	Funding requests may not exceed $8,000 per application. Selected projects are awarded funding on a continuing basis until available funds have been allocated (NDF 2026c)

Funding ID	Funding Agency	Grant/ Funding Program	Description	Requirements	Application Period	Description of Funding Amounts and Timing of Availability
NDF-04	USFS	Landscape Scale Restoration Grants	Federal funding distributed through NDF, Landscape Scale Restoration projects cross multiple jurisdictions, including state, Tribal, local government, and private forest land, to address large-scale issues such as wildfire risk reduction, watershed protection and restoration, and the spread of invasive species, insect infestation and disease (NDF 2026d).	To qualify, • Projects must promote collaborative, science-based restoration of priority landscapes and further the goals of Nevada's State Forest, Range and Watershed Action Plan. • Projects must be in rural areas, defined as having a population of less than 50,000 inhabitants. • Projects must address large-scale issues, such as wildfire risk reduction, watershed protection, invasive species removal, and forest health improvement. Applicants must provide a 10% non-federal match to cover project costs (NDF 2026d).	Variable from year to year, proposals accepted year-round.	Funding amounts and availability vary by proposal ranking (USFS 2026).
NDEP-01	NDEP	State nonpoint source (Section 319)	Federal funding distributed by NDEP for watershed planning and outreach campaigns and to help with projects that reduce nonpoint source pollution; example projects include stream restoration projects, outreach projects, irrigation improvements, and grazing management projects (NDEP 2026).	The project must be within a watershed with a completed nine-element watershed plan and benefit water quality conditions. Applications will be ranked based on multiple criteria. Project proponents are encouraged to work with National Park Staff Program staff prior to submitting a proposal to ensure that it is eligible, complete and competitive. Projects that are not eligible and complete will be returned without review (NDEP 2026).	Variable from year to year.	Funds are made available to grant recipients at the beginning of the fiscal year.
U.S. Department of Agriculture (USDA)-01	USDA	Single-Family Housing Repair Loans and Grant Programs	Offers low-interest loans to repair, improve, or modernize rural single-family homes or grants to elderly very-low-income homeowners to remove health and safety hazards,	To qualify for a loan or grant, applicants must be homeowners who are unable to obtain affordable credit elsewhere and have a household income that meets eligibility requirements.	Year-round.	Loan amounts are capped at $40,000 while maximum grant amount is $10,000. Loans are termed for 20 years at 1% fixed interest. Grants have a $10,000 lifetime limit, except in

Funding ID	Funding Agency	Grant/ Funding Program	Description	Requirements	Application Period	Description of Funding Amounts and Timing of Availability
			including septic systems. Loans may be used on repairs and improvements, and grants must be used to remove health and safety hazards. The maximum loan amount is $40,000 and the maximum grant amount is $10,000 (U.S. Department of Agriculture Rural Development [USDARD] 2026).	For grants, applicants must also be 62 years of age or older (USDARD 2026).		residentially declared disaster areas, which have a $15,000 limit. Grants must be repaid if property is sold in less than 3 years (USDARD 2026)
Nevada Department of Conservation and Natural Resources (NDC)-01	NDC	Conserve Nevada Program	Grant program administered by the NDC that provides funding for public-benefit capital projects with a minimum 20-year lifespan, including conservation, recreation, and restoration infrastructure. Eligible activities include riverbank stabilization, habitat and wetland restoration, wildfire mitigation treatments, conservation land or easement acquisition, and planning or engineering that directly supports capital improvements, with applicants required to provide at least a 10% match and complete expenditures within program bond-funding timelines (NDCNR 2026).	Qualified applicants include: State executive-branch agencies (including the Nevada System of Higher Education), 501(c)(3) nonprofit organizations, and local governments or political subdivisions (e.g., counties, cities, towns, general improvement districts, conservation districts, water conservancy districts) (NDCNR 2006). The Conserve Nevada Program provides financial assistance for capital projects with a minimum 20-year lifespan, including planning and design activities that directly support those capital improvements. Eligible projects must provide public benefit and cannot support private use. Eligible project types include: • Wildfire mitigation and restoration • Recreation facility, campsite, and trail design or construction • Riverbank stabilization, habitat restoration, and wetland protection/restoration	Applications due in March. Selection of award recipients occurs in spring.	Applicants must provide a matching contribution of not less than 10% of the total cost of the project. Applicants may provide cash match or in-kind contributions to meet match requirements. It should be noted that while 10% is a minimum contribution requirement for the program, additional match will be considered for purpose of ranking an application (NDCNR 2026). Projects must expend at least 10% of their award within six months of bond issuance and be fully obligated by June. Projects should aim to expend 45%–0% of awarded funds within 12 months of a bonds issuance. Projects will be required to expend a minimum of 85% of their awarded funds within 3 years of issuance (NDCNR 2026).

Funding ID	Funding Agency	Grant/ Funding Program	Description	Requirements	Application Period	Description of Funding Amounts and Timing of Availability
				• Land or water acquisition for conservation or recreation (including conservation and public-access easements) • Projects enhancing the Truckee and Carson River corridors • Acquisition and retirement of credits to protect sagebrush ecosystems		
Nevada Department of Agriculture (NDA)-01	NDA	Invasive Plant Cost Share Program	Grant program administered by the Nevada Department of Agriculture that provides federal cost-share funding to support control, monitoring, and restoration efforts targeting Nevada noxious weeds and early detection/rapid response (EDRR) species. Eligible activities include invasive plant treatment, revegetation, mapping and surveys, biological control, outreach, and collaborative weed-management initiatives that protect forested and rangeland ecosystems.	Eligible applicants must comply with state financial accounting procedures and federal grant requirements (2 CFR 200), provide a 1:1 non-federal match (cash or in-kind), and implement projects within Nevada areas containing at least 10% forested land or directly benefiting such areas. Projects must focus on Nevada noxious weed or EDRR species management, including activities such as restoration, revegetation, mapping, surveys, biological control, outreach, or Cooperative Weed Management Area development. Applicants must demonstrate the capacity to conduct pre- and post-treatment monitoring, maintain an EDD Maps account and submit project inventory data, and complete quarterly fiscal and activity reporting, reimbursement requests, and annual performance reports documenting acres treated, restored, and species addressed.	Applications are due in January.	Unavailable