

CHAPTER 10

Water & Natural Resources



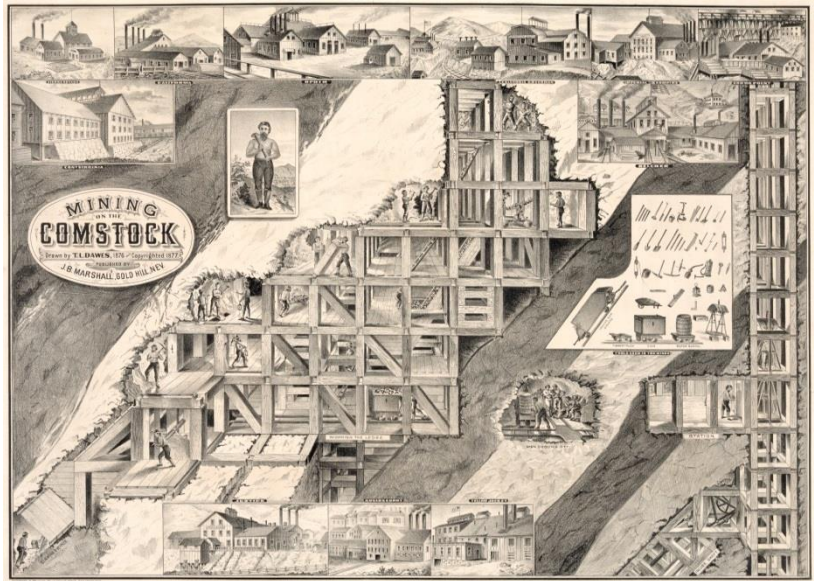
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10.1 Introduction

Storey County contains many wonderful natural features and resources. Above Virginia City, Mount Davidson stands 7,868 feet and is the highest point in Storey County. Below Virginia City, was the famous Comstock Lode. This natural resource of Storey County produced over 6.9 million tons of ore and many technological advancements. This mining bonanza helped Nevada become a state, and gave Nevada the “Silver State” name.

There are 167,680 total acres in Storey County, 39,146 acres are in the Carson basin with the remaining 128,534 acres of land in the Truckee River Basin. The Tahoe-Reno Industrial Center encompasses roughly 107,000 acres, well over half of the land area in the county. The Highlands encompasses roughly 24,000 acres. Other larger and undeveloped areas of the county include Lagomarsino, Mark Twain, Lockwood Mustang, Painted Rock and the Northeast part of the county. See Chapter 3 Land Use for more details.



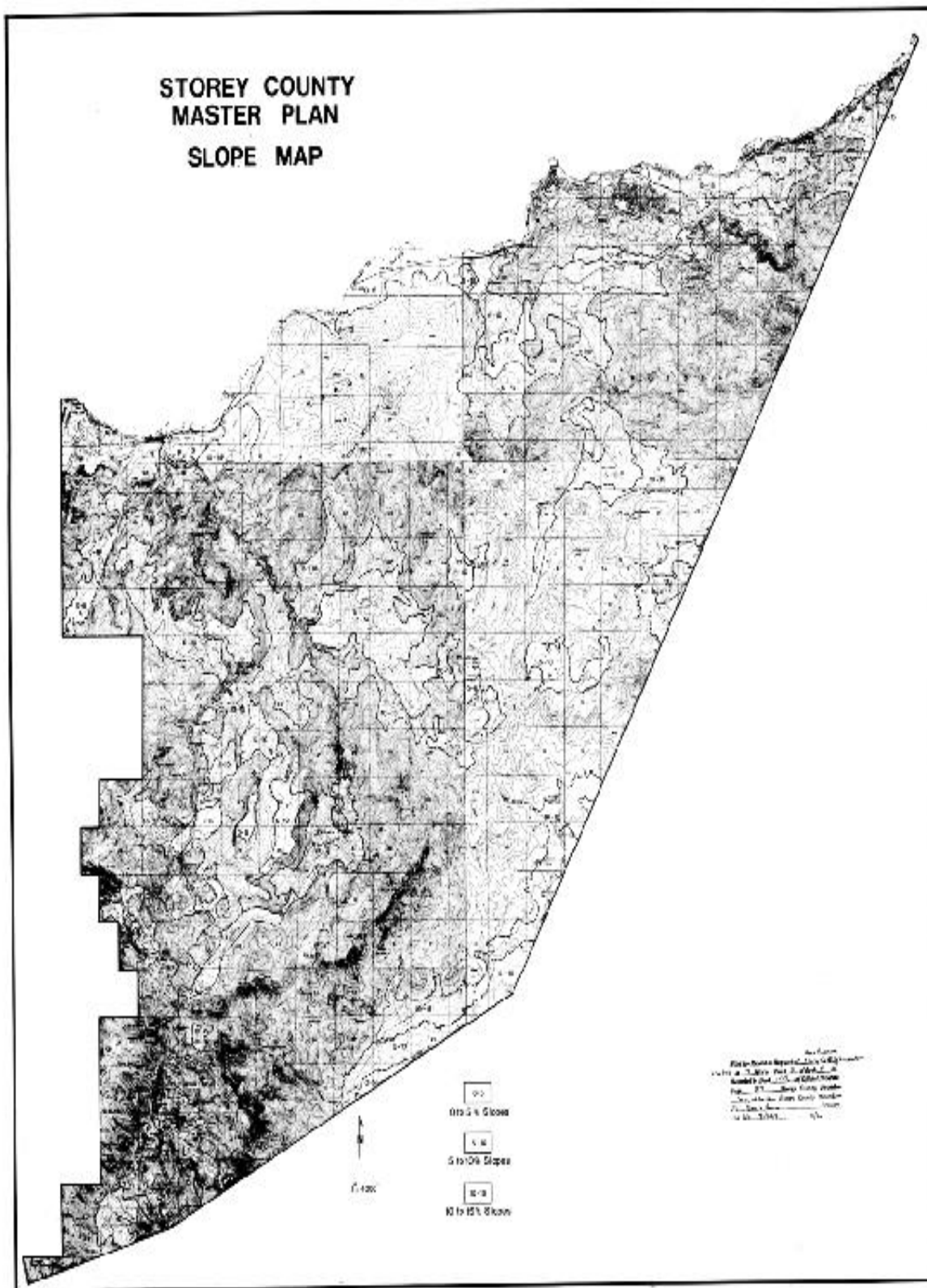
As these larger and mostly undeveloped areas of the county become developed, the protection of the county’s environmental and natural resources should be of importance. Storey County has a history of open space and a population that enjoys the recreational use of that open space.

10.2 Topography

Storey County is mostly comprised of mountainous terrain with some flat land existing in the Mark Twain area, the south banks of the River District, and within the interior of the county’s northeast within the currently developing Tahoe-Reno Industrial Center area and some in the Highlands area. Although Virginia City itself was built on steep slopes, the fragility of the land makes it undesirable to follow this precedent. Only slopes of less than 10 percent should be developed unless engineered properly.

10.2.1 Slope Analysis

A slope analysis has been made and a map prepared to determine topography and terrain suitable for various types of industrial development (such as manufacturing and warehousing). This information is charted on the Slope Analysis Map recorded #74667, Book 102, Page 37, which is available for reference at the Storey County Recorder's Office (see below). Terrain with 0 to 5 percent, and 5 to 15 percent were initially considered as most probable development areas. This analysis reveals that development of much of the county is prohibitive.



10.3 Climate

Virginia City and the nearby Virginia Highlands are located at an elevation of over 6,000 feet. This is considerably higher than the rest of the county's populated areas. The Mark Twain and River Districts are more representative of the temperatures experienced in the Reno and Carson City areas.

The county's high mountainous location is also conducive to higher precipitation amounts which average slightly over 12 inches a year. Much of this precipitation comes in as snow during the winter. Total snow fall averages 56 inches a year but over three feet can fall in one month.

Summer daytime average temperatures are in the 70s and low 80s. The nighttime temperatures drop down to the mid-50s. During the winter, daytime high temperatures average 40 to 50 degrees and nighttime temperatures range from 25 to 30 degrees F.

Despite the high elevation of Virginia City, Gold Hill, and the Highlands, the growing season is relatively long, averaging 107 days per year. Relative humidity is slightly higher than the regional average. Humidity averages 30 to 50 percent over the year, but varies from about 70 percent during the winter to approximately 20 percent during mid-summer. Thunderstorms average about 10 to 15 storms per year and are usually accompanied by lightening.

Wind information is relatively sparse. The higher exposed location of Virginia City leads to higher wind velocities. The Virginia Range also has an effect on the prevailing winds, which generally are from north to south and west to east. However, upslope and downslope valley winds are dominate throughout the day. Occasionally wind speed has been known to reach over 100 miles per hour.

Figure 10.3-1 Virginia City Weather (degree F)							
	Ave Hi	Ave Low	Ave Precip Inch/Yr	Record Hi	Year	Record Low	Year
January	42	25	1.7	63	1971	-1	1997
February	44	26	2.1	70	1986	-9	1989
March	50	31	1.5	74	1966	4	1971
April	56	35	0.7	79	1989	10	1970
May	65	43	0.5	109	1984	0	2011
June	75	52	0.5	95	1966	0	2011
July	84	60	0.3	99	2002	36	1983
August	83	59	0.3	100	1970	31	1951
September	74	51	0.6	93	1960	21	1970
October	62	41	0.8	84	2001	11	1971
November	49	31	1.6	72	1976	6	2010
December	41	24	1.8	69	1958	-11	1972

Source: www.Weather.com

10.3.1 Air quality

Air quality in Storey County is generally very good. Air movement through the county normally helps to maintain the quality. Generally, Virginia City and the Virginia Highlands do not experience the stagnating air which normally occurs, particularly during winter, on many valley floors of Nevada. Wild fires can have a significant negative impact on air quality. High winds pick up dust and pollen from time to time.

10.4 Geology

The geology of the county has greatly dictated its development. Among the most notable geological contributions has been a wealth of minerals and fragmented ground water resources. The mineral deposits shaped the county's early development, while poor quality ground water throughout the county has restricted some development activities.

Much of the county is underlain by relatively stable volcanic bedrock, blanketed by a very shallow surface cover. However, deposits of unstable conglomerates, sandstones, shales and diatomaceous sediments also exist. Gravel and sand deposits also occur in the alluvial planes. Soil Survey of Storey County Area, Nevada; May, 1990.

10.5 Seismology

Storey County is located in seismic zone 4. Seismic zones are rated 1 through 4, with seismic zone 1 having the minimum number of seismic events and zone 4 being the most active. This becomes a major consideration for land use planning and particular construction requirements are necessary. As compared to neighboring counties, Storey County has fewer faults. The lines on the map to the right show faults. The blue means that it is an older fault as compared to the green, yellow, orange or red lines.

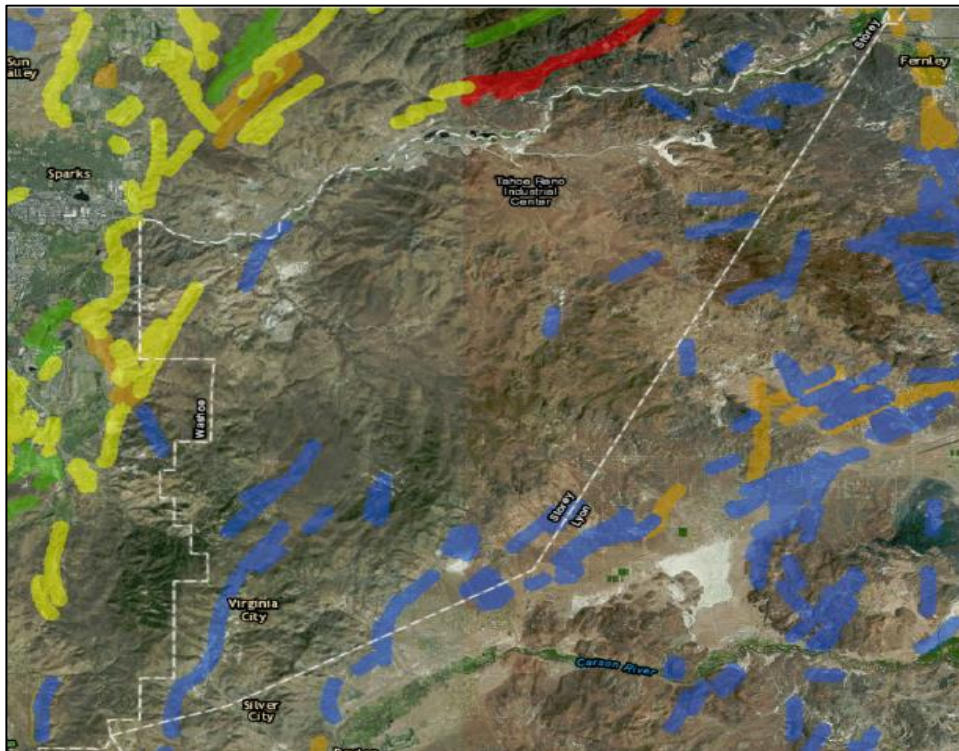


Figure 10.5-1:
Representation of
Seismological
activity in Storey
County. *Source:*
U.S. Geological
Survey, 2015

10.6 Soils

A comprehensive soil survey for Storey County has been generated by the U.S. Soil Conservation Services and is used to describe soil characteristics which affect the county's potential.

Of concern to the county is its marginal ability to capture and hold what little precipitation it receives. All but a small portion of the county has been classified by the U.S. Soil Conservation Services as exhibiting poor infiltration capability. Soil interpretations for both profile permeability and soil hydrologic grouping lead to this conclusion. Because of this condition, most of the county's runoff occurs as surface flow. Only a small portion occurs as ground water yield.

Runoff leaves the county immediately, which does take its toll in terms of erosion. Most of the county's soils exhibit a moderate to severe erosion hazard. Any disturbance to natural conditions will greatly increase the hazard.

Efforts should be made to slow the water runoff to encourage greater infiltration. Recommendations should be developed for home and property owners to slow the flow and decrease erosion at the same time. The county might consider infrastructure projects to slow the flow of larger drainage canyons as well. Development considerations should continue to be made for water availability, water permeability for septic, and drainage issues.

Wind erosion is also a factor to consider. Most of the county exhibits a moderate to severe hazard. Likewise, any disturbance to natural conditions, such as blading to create roads, will greatly increase wind erosion problems.

10.7 Flora

Vegetation within the county is mainly restricted to three communities: the Pinion-Juniper, the Big Sagebrush-Grass, and the Low Sagebrush-Grass. The Pinion-Juniper, located in the upper elevations of Storey County, is accompanied with an understory of big sagebrush and antelope bitterbrush. Frequently lying above the Pinion-Juniper is the Low Sagebrush-Grass community. Associated with low sage are grasses and forbs such as needlegrass and balsamroot. Below the Pinion-Juniper lie the Big Sagebrush-Grass community. Big sagebrush is accompanied by a host of grasses, forbs and shrubs.

These vegetal communities are typical of the region, and exist in a very harsh climate. Recovery from disturbance is slow. Disturbance to vegetation leads to a host of environmental problems such as dislocation of native fauna (permanent or seasonal), increased erosional hazards and a deterioration of the local watershed. Either maintaining native vegetation, or other plant growth should be encouraged to maintain the top soil of the county. See Exhibit A in this chapter for a comprehensive list.

10.8 Fauna

Within the interior of Storey County exist the usual array of wildlife found in Western Nevada. The Truckee river is important to the region's fishery and once again provides spawning grounds for the Lahontan Cutthroat Trout and the cui-ui.

Further inland, game birds such as the mountain and California valley quail, dove, and chucker partridge are around the county's springs and seeps. Sage grouse might be in the county, although none have been identified. Cottontail rabbits dwell close to these natural water supplies.

In terms of larger animals, the County hosts one of Nevada's larger herds of wild horses. The U.S. Bureau of Land Management estimates the Nevada population of wild horses at over 27,000 animals. Several hundred of those live throughout the County. The wild horse is the primary grazing animal in some areas, notably the Highlands area and Tahoe-Reno Industrial Center. These herds keep the fine fuel (dry grasses) from adding to the high fire danger. However, the competition for available forage and water is high, and the herd could exceed the natural carrying capacity of the range.

Storey County provides a habitat for both a resident population of deer as well as a wintering ground for a portion of those deer that summer around and about the Tahoe Basin. The Flowery Range-Upper Long Valley Creek area is a key deer wintering site, as is the western face of the Virginia Mountains in Washoe County. Regular seasonal migration routes include the Five Mile Flat area as well as the canyons between Gold Hill and Silver City. Other notable large animals in the county include black bears, cougars, and bobcats.

Associated with the game are the usual assortment of non-game species, ranging from chipmunks to eagles to coyotes and western diamondback rattle snake. All of the county's fauna survive within a delicate framework of available water and food. Thus the fauna are intimately associated with the county's fragile environment and are therefore equally fragile. See Exhibit A in this chapter for a comprehensive list of fauna.

10.9 Water

Like most of Western Nevada, Storey County lies in the rain shadow created by the Sierra Nevada mountain Range and most of the county lies in another rain shadow created by a portion of the Virginia Range.

Average annual precipitation in Virginia City is 9.94 inches per year. Higher elevations of the county receive 12 to 15 inches of precipitation annually while the area's lower elevations receive about five inches of precipitation annually. The county has areas of snow accumulation especially at higher elevations.

Annual recharge is challenging in the county for a variety of reasons. Because the topography is generally steep, the soil permeability low, and vegetation sparse, it is difficult to retain water within the county, except for the alluvial fans located at the base of various drainage networks. Storey County is subject to climatic conditions characteristic of a high-mountain desert. During the

summertime, sporadic convection storms deliver about 25 percent of the region's annual precipitation in large amounts over small areas. Winter storms are the primary source of upslope recharge.

10.9.1 Implications for Future Development

As water is essential to any land use, availability of water should be the primary consideration in determining if development is appropriate for any given area. The responsibility of such considerations falls upon Storey County.

Three parameters make potable ground water scarce. They are low precipitation, low recharge and a soil mantle high in sulfates, iron, and numerous other elements which become dissolved in what little ground water that does exist.

Because of past ground water development successes and failures in Storey County, future development should be treated very carefully. A cautious approach would actually benefit the county because it would help ensure the success of new developments thereby avoiding possible county burdens in the future. Such a cautious approach would also protect the general public from what might prove to be unwise investments.

With the exception of the Truckee River flood plain, most of the county can be developed only at exceedingly low densities. The Mark Twain area should be included in the concept of low density uses, as it appears the water table is falling.

Development density should be based on that amount of land necessary to provide recharge equal to the needs of the proposed use. A criterion for density zoning then becomes a situation of defining recharge rates for areas in question. The Nevada State Engineer does this through water rights. While there is some debate on the accuracy of wet water (physical water that can be pumped from the ground) versus paper water (a water right), the water rights system in Nevada is the best available information and the best water rights system in the country. Any further subdivision and development outside of any of the water systems in the county must own water rights to accompany the subdivision application.

10.9.2 Water Systems in the County

Presently, the only source of domestic water for the Virginia City - Gold Hill area comes from the State owned Marlette-Hobart water system. The Virginia City - Gold Hill water system has a contract with the Marlette-Hobart State system. While the contract defines rates to pay for the system, the Virginia City area and Carson City have rights to 10 cubic feet of water per second from the Franktown Decree. This is about 7,200 acre-feet of water. Not only is this more water than the Virginia City water system can handle, it is more than the Virginia City Area can use for now, and more than the Marlette-Hobart system can produce.

In summary, the limiting resource in the system is the transmission capability, rather than the peaking or total annual water availability at the source. Development serviced by the Virginia City water system should be allowed, and could more than accommodate the population growth expectations from the Population Chapter of this Master Plan.

Tahoe Reno Industrial Center and Rainbow Bent are serviced by their own water systems within their general improvement districts. The TRI General Improvement District has capacity for much more growth, and their grey water system adds to their conservation efforts. The Lockwood General Improvement District has a smaller defined community that it supports. Growth prospects for the this general improvement district are limited.

10.9.3 Water Quality

Analysis of ground water as a source for domestic water requires evaluation of both quality and quantity. Findings, from a study for the 1994 Master Plan, of water quality from twenty Storey County wells and three mine shafts, shows twelve sites not meeting acceptable water drinking standards. Only two sites in the Mustang area, one at the Orchard Exit, two at Painted Rock and three in the Mark Twain area met or exceeded water drinking standards.

In summary, 60 percent of the 20 samples submitted for quality analysis of Storey County well water were found to be below standards for domestic consumption. This figure has been determined to be three times that of the five county western Nevada regional average. The implication is that water is not only scarce in Storey County but the quality of available ground water quality is also poor.

10.10 Summary

Future land use densities should be based on water availability from basin-wide inventories. The planning will be based on basin conditions as a whole, an approach which may not be accurate for any specific location. This should result in land not being developed at densities that will lead to the mining of water. Population densities should not be allowed to exceed the point where more water is taken out of the ground than is naturally recharged.

Precipitation at the Virginia City rain gauge is ten inches per year. This gauge is the only one in the county has provided data over a sufficient length of time for analysis. Although located below Mt. Davidson in the rain shadow of the western boundary of the Virginia Range, it is observed that most of Storey County lies in the same rain shadow. Based on these facts it is reasonable to use the 10 inches per year as an average precipitation figure for the county until more accurate precipitation data become available.

It is obvious that sufficient water of potable quality should be produced for residential developments. The generally accepted standard is one acre-foot available for each single family dwelling. This is a reasonable standard, as it encompasses not only the actual water use of the residents but also the numerous demands created by subdivision development (firefighting, recreational use, water loss, etc.).

It is recommended that county aquifers be monitored through well logs, a ground water monitoring system, or a joint study/effort to monitor sensitive areas where well water is the primary source.

10.10.1 Goals and objectives

Goal 1 Retain existing water resources which exist for the benefits of Mark Twain residents

Objective 1 Request the legislation, both at county and state level, to allow restriction or to prevent water or water rights exportation to areas outside Mark Twain

Objective 2 Request Nevada State Engineer to commence hydraulic study of water basin in Mark Twain to determine quantity and quality of aquifers to assure aquifers are not being depleted beyond their recharging capabilities

Policy 1 Discourage exporting or selling off water rights form Story County

Objective 3 Cooperate with and encourage area mining operations, residences and other land uses to implement water conservation practices.

Goal 2 Retain existing water resources for the River District

Objective 1 Require new development to obtain water rights before land use permits are approved

Objective 2 With local residents and development firms, investigate the feasibility of developing a unified water and sewer district for the River District

Policy 1 Discourage exporting or selling off water rights form Story County

Goal 3 Preserve existing agricultural areas

Objective 1 Direct non-agricultural development to non-agricultural areas through zoning regulations

Policy 1 Discourage exporting or selling off water rights form Story County

Objective 2 Encourage conservation farming such as low water use crops and techniques to minimize evaporation

Goal 4 Maintain an environment which is healthy, safe, and desirable for residents throughout the county

Policy 1 Preserve open space within the county

Objective 1 Work with conservation groups to minimize invasive weeds

Goal 5 Ensure that present and future county residents have an adequate water supply meeting safe drinking standards

- Objective 1 Require all proposed planned unit developments to furnish proof of owned rights to adequate water meeting safe drinking standards before necessary land use or building permit applications are considered
- Objective 2 Actively participate on regional governmental water agencies to ensure the water rights of all owners and residents are protected. In addition, actively protest the granting of water rights or land development proposals which will have a negative impact on the quantity and/or quality of Storey County residents' water supply
- Objective 3 Continue to encourage and require, when feasible, the use of recycled, treated effluent water for agrarian and recreational uses. Establish the county's priority of right to the use of this water
- Policy 1 Encourage landscaping to minimize erosion, and increase infiltration
- Objective 4 Request the Nevada State Engineer to undertake a hydrologic study of water resources in the undeveloped northerly and easterly portion of the county and the stability of the water aquifer in the Highlands
- Objective 5 Continue to maintain, replace, and upgrade segments of the Marlette Water System pipeline, as necessary.
- Objective 6 Maintain the primacy of the Virginia City/Gold Hill water allotment allocated in the Franktown Water Decree
- Objective 7 Enhance local water conservation awareness and investigate ordinance changes to require conservation
- Objective 8 Redefine by County Ordinance the geographic boundaries of the town site of Gold Hill as originally written
- Objective 9 Discourage landscaping which requires large amounts of water. Encourage xeriscaping techniques on landscaped public right-of-way areas, around public building and other public areas and other landscaping to slow run off from county.

Goal 6 Protect the quality of present and future water resources

- Objective 1 Refuse special use permitting of industries which cannot guarantee the quality of effluent produced by their activity. Require users of toxic or hazardous materials to provide monitoring capabilities to assure protection from surface and groundwater contamination
- Objective 2 Engage in collaborative efforts with surrounding water quality and land conservation entities to implement watershed improvement programs within Long Valley Creek, and Six Mile and Seven Mile Canyons

Objective 3 Actively protest the granting of water rights or land development proposals which will have a negative impact on the quantity and/or quality of Storey County residents' water supply

Objective 4 Slow the runoff of precipitation to limit erosion damage, minimize flooding impacts, and encourage greater recharge of county aquifers

Objective 5 Encourage new developments to design with native animal and plant interests in mind to encourage their growth, and leverage their benefits

Goal 7 Regulate use of open-range and watershed areas to minimize fire danger and prevent degradation

Objective 1 Assist property owners and interested groups in controlling grazing and public use of critical watershed and riparian areas

Objective 2 Cooperate with ranchers, property owners and interested groups in the county in managing wild horses and other grazing animals, in numbers which will not exceed capacity of the land

Exhibit A: List of Flora and Fauna in Storey County**FLORA AND FAUNA**

FLORA

RIPARIANTrees:

Fremont cottonwood Populus fremontii
French tamarisk Tamarix gallica
Willow Salix spp.
Silver buffalo berry Shepherdia argentea

Shrubs:

Rubber rabbitbrush Chrysothamnus nauseosus
Quail brush or Big salt bush Atriplex lentiformis
Wild rose Rosa spp.
Big sagebrush Artemisia tridentata

Grasses:

Saltgrass Distichlis stricta
Beardless wild rye or creeping wild rye Elymus triticoides
Blue wild rye Elymus glaucus
Alkali sacaton Sporobolus airoides

Grass-like:

Sedge Carex spp.

Forbs:

Dock Rumex spp.
Alkali seepweed or Bush seepweed Suaeda moguinii

SALT DESERT SHRUB**Big Greasewood**Shrubs:

Big greasewood Sarcobatus vermiculatus
Inkwood Suaeda Torreyana ramosissima
Kochia Kochia americana
Shadscale Atriplex confertifolia
Red sage Kochia vestita
Quailbrush or Big salt bush Atriplex lentiformis
Dalea Psoralea polydenius

Forbs:Halogeton Halogeton glomerataGlobe mallow Sphaeralcea spp.Russian thistle Salsola tragus**NORTHERN DESERT SHRUB****Big Sagebrush**Trees:Pinyon pine Pinus monophyllaShrubs:Big sagebrush Artemisia tridentataHop sage Grayia spinosaBitterbrush Purshia tridentataBud sagebrush Artemisia spinescensSpineless horsebrush Tetradymia canescensRubber rabbitbrush Chrysothamnus nauseosusSticky-leaf rabbitbrush or yellow or green rabbitbrush Chrysothamnus viscidiflorusDryland greasewood Sarcobatus baileyiLittle-leaf horsebrush Tetradymia glabrataLow sagebrush Artemisia arbusculaWinterfat Ceratoides lanataShort-spine horsebrush Tetradymia spinoseShadscale Atriplex confertifoliaSquaw tea Ephedra viridisDesert peach Prunus andersoniiCurrant, gooseberry Ribes sppRose Rosa sppGrasses:Nevada bluegrass Poa nevadensisSandberg bluegrass Poa secundaSquirrel tail Sitanion hystrixDesert needlegrass Stipa speciosaThurber's needlegrass Stipa thurberianaCheatgrass Bromus tectorumIndian ricegrass Oryzopsis hymenoidesGalleta Hilaria jamesiiGreat Basin wild rye Elymus cinereus**Low Sagebrush**Trees:Pinyon pine Pinus monophyllaShrubs:Low sagebrush Artemisia arbuscula

Sticky-leaf rabbitbrush or yellow or green rabbitbrush Chrysothamnus viscidiflorus
Prickly phlox Leptodactylon pungens
Big sagebrush Artemisia tridentata
Mormon tea Ephedra virides
Snowberry Symphoricarpus spp
Bitterbrush Purshia tridentata
Serviceberry Amelanchier alnifolia
Ocean spray Holodiscus discolor
Buckwheat or Shrubby eriogonum Eriogonum spp.
Currant, gooseberry Ribes spp
Bud sage Artemisia spinescens

Forbs:

Indian paint brush Castilleja spp
Lupine Lupinus spp
Phlox Phlox spp
Mules ears Wyethia amplexicaulis

Grasses:

Sandberg bluegrass Poa secunda
Cheatgrass Bromus tectorum
Squirrel tail Sitanion hystrix
Great Basin wild rye Elymus cinereus
Thurber needlegrass Stipa thurberiana

PINION - JUNIPER

Trees:

Pinyon pine Pinus monophylla
Utah juniper Juniperus osteosperma
Quaking aspen Populus tremuloides
Fremont cottonwood Populus fremontii

Shrubs:

Big sagebrush Artemisia tridentata
Low sagebrush Artemisia arbuscula
Rubber rabbitbrush Chrysothamnus nauseosus
Sticky-leaf rabbitbrush or yellow or green rabbitbrush Chrysothamnus viscidiflorus
Prickly phlox Leptodactylon pungens
Squaw tea Ephedra viridis
Buckwheat Eriogonum spp
Hop sage Grayia spinosa
Spiny horsebrush Tetradymia glabrata
Bitterbrush Purshia tridentata
Mountain mahogany Cercocarpus ledifolius
Serviceberry Amelanchier alnifolia
Ocean spray Holodiscus discolor
Currant, gooseberry Ribes spp.

Skeleton plant Stephanomeria

Forbs:

Lupine Lupinus spp.

Indian paint brush Castilleja spp.

Buckwheat Eriogonum spp.

Locoweed Astragalus spp.

Phlox Phlox spp.

Grasses:

Sandberg bluegrass Poa secunda

Nevada bluegrass Poa nevadensis

Cheatgrass Bromus tectorum

GRASSLAND

Shrubs:

Dryland greasewood Sarcobatus vermiculatus var. baileyi

Sticky-leaf rabbitbrush or yellow or green rabbitbrush Chrysothamnus viscidiflorus

Mormon tea Ephedra nevadensis

Short-spine horsebrush Tetradymia spinosa

Fourwing saltbush Atriplex canescens

Winterfat Ceratoides lanata

Forbs:

Russian thistle Salsola tragus

Halogeton Halogeton glomeratus

Pickleweed Salicornia ambigua

Grasses:

Cheatgrass Bromus tectorum

Indian ricegrass Oryzopsis hymenoides

Squirrel tail Sitanion hystrix

Saltgrass Distichlis stricta

Alkali sacaton Sporobolus airoides

CONIFER

Trees:

Western white pine Pinus monticola

Limber pine Pinus flexilis

Jeffrey pine Pinus jeffreyi

White fir Abies concolor

Shrubs:

Big sagebrush Artemisia tridentata

Mountain mahogany Cercocarpus ledifolius

Sticky-leaf Rabbitbrush or yellow or green rabbitbrush Chrysothamnus viscidiflorus
Currant, gooseberry Ribes spp.
Bitterbrush Purshia tridentata
Prickly phlox Leptodactylon pungens

Grasses:

Sandberg bluegrass Poa secunda
Needlegrass Stipa spp.
June grass Koeleria nitida

Grass-like:

Sedge Carex spp.

Forbs:

Indian paint brush Castilleja spp.
Lupine Lupinus spp.

MOUNTAIN BRUSH

Shrubs:

Ocean spray Holodiscus discolor
Currant, gooseberry Ribes spp
Chokecherry Prunus virginiana
Curleaf mountain mahogany Cercoparpus ledifolius
Bitterbrush Purshia tridentata
Elderberry Sambucus caerulea
Serviceberry Amelanchier alnifolia
Snowbrush Ceanothus velutinus
Squaw tea Ephedra viridis
Snowberry Symphoricarpos albus
Rose Rosa spp.
Big sagebrush Artemisia tridentata
Rubber rabbitbrush Chrysothamnus nauseosus
Sticky-leaf rabbitbrush or yellow or green rabbitbrush Chrysothamnus viscidiflorus

Forbs:

Mule ears Wyethia amplexicaulis
Indian paint bush Castilleja spp.
Phlox Phlox spp.
Lupine Lupinus spp.
Buckwheat Eriogonum spp.
Sunflower Helianthus spp.
Balsamroot Balsamorhiza sagittata
Sneezeweed Helenium hoopesii
Beardtongue Penstemon spp.
Desert parsley Lomatium spp.
Horsemint Agastache urticifolia

Goldenbush Haplopappus spp.

Grasses:

Needle and threadgrass Stipa comata

Columbia needlegrass Stipa columbiana

Western needlegrass Stipa occidentalis

Sandberg bluegrass Poa secunda

Nevada blue grass Poa nevadensis

Mutton grass Poa fendleriana

Mountain brome Bromus marginatus

Smooth brome Bromus inermis

Cheatgrass Bromus tectorum

Creeping or beardless wildrye Elymus triticoides

Great basin wildrye Elymus cinereus

Squirrel tail Sitanion hystrix

June grass Koeleria nitida

Hesperchloa Hesperochloa kingii

Idaho fescur Festuca idahoensis

Bluebunch wheatgrass Agropyron spicatum

Wheatgrass Agropyron spp.

Trees:

White fir Abies concolor

Jeffrey pine Pinus jeffreyi

Pinyon pine Pinus monophylla

Ponderosa pine Pinus ponderosa

Quaking aspen Populus tremuloides

FAUNA

MAMMALS

Cat Family

Mountain Lion (*Felis concolor*)

Bobcat (*Lynx rufus*)

Dog Family

Coyote (*Canis latrans*)

Red Fox (*Vulpus Fulva*)

Gray Fox (*Urocyon cinereoargenteus*)

Kit Fox (*Vulpes macrotis*)

Herbivores

Mule Deer (*Odocoileus hemionus*)

Rabbit Family

Black-tailed Jackrabbit (*Lepus californicus*)

Nuttall Cottontail (*Sylvilagus nuttali*)

Weasel Family

- Short-tailed Weasel (*Mustela erminea*)
- Long-tailed Weasel (*Mustela frenata*)

Rodent Family

- Porcupine (*Erithizon dorsatum*)
- Muskrat (*Ondatria zibethica*)
- Belding Ground Squirrel (*Citellus beldingi*)
- Least Chipmunk (*Eutamias minimus*)
- Cliff Chipmunk (*Eutamias dorsalis*)
- Great Basin Pocket Mouse (*Perognathus parvus*)
- Canyon Mouse (*Peromyscus crinitus*)
- Pinion Mouse (*Peromyscus truei*)
- Bushy Tailed Woodrat (*Neotoma cinerea*)
- Panamint Kangaroo Rat (*Microdipodops*)
- Chisel-toothed Kangaroo Rat (*Dipodomys*)
- Valley Pocket Gopher (*Thomomys bottae*)

BIRDSEagles and Hawks (Accipitridae)

- Golden Eagle
- Red-tail Hawk
- Cooper's Hawk
- Goshawk
- Sharp-shinned Hawk

Falcons (Falconidae)

- Prairie Falcon
- American Kestrel
- Sparrow Hawk

Owls

- Great Horned
- Long-eared
- Burrowing

Vultures (Falconiformes cathartidae)

- Turkey Vulture

Quails, Pheasants, Partridges (Phasianidae)

- California Quail
- Chukkar (introduced)

Goatsuckers (Caprimulgiformes caprimulgidae)

- Poor-will
- Common Nighthawk

Woodpeckers (Piciformes picidae)

Downy Woodpecker
Hairy Woodpecker
Common Flicker
Yellow-bellied Sapsucker

Flycatchers (Passeriformes Picidae)

Say's Phoebe

Jays, Magpies (Corvidae)

Stellar's Jay
Scrub Jay
Pinyon Jay
Magpie

Chickadees, Titmice, etc. (Paridae/Sittidae)

Mountain Chickadee
Plain Titmouse
Common Bushtit
Red-breasted Nuthatch

Tanager (Thraupidae)

Western Tanager

Hummingbirds (Trochilidae)

Black-chinned
Broad-tailed
Calliope

Finches, Grosbeaks, Sparrows (Fringillidae)

Evening Grosbeak
Cassin's Finch
Lesser Goldfinch
American Goldfinch
Green-tailed Towhee
Rufous-sided Towhee
House Finch
Pine Siskin
Savannah Sparrow
Black-throated Sparrow
Sage Sparrow
Dark-eyed Junco
Tree Sparrow
Chipping Sparrow
White Crowned Sparrow
Fox Sparrow

Song Sparrow

Wrens (Troglodytidae)

House

Bewick's

Canyon

Rock

Thrushes, Bluebirds, Solitaires (Turdidae)

Mountain Bluebird

Robin

Townsend's Solitaire

Meadowlarks, Blackbirds (Icteridae)

Western Meadowlark

Yellow-headed Blackbird

Red-winged Blackbird

Brewer's Blackbird

Brown-headed Cowbird

Warblers (Parulidae)

Blue-Gray Gnatcatcher

Ruby-Crowned Kinglet

Golden-Crowned Kinglet

Larks (Alaudidae)

Horned Lark

Swallows (Hirundinidae)

Barn Swallow

Cliff Swallow

Waxwings (Bombycillidae)

Cedar Waxwing

Doves (Columbidae)

Mourning Dove

Gulls (Laridae)

California Gull

Plovers (Charadriiformes Charadiidae)

Killdeer

Coots (Rallidae)

American Coot

Geese, Ducks (Anseriformes Anatidae)

Canada Goose
Mallard
Pintail
Cinnamon Teal

REPTILES

Spadefoot Toad Family (Pelobatidae)

Great Basin Spadefoot (*Scaphiopus Intermontanus*)

True Frog Family (Ranidae)

Bullfrog (*Rana Catesheiana*)
Northern Leopard Frog (*Rana Pipiens*)

Toad Family (Bufonidae)

Western Toad (*Bufo Boreas*)
Woodhouses Toad (*Bufo Woodhousei*)

Treefrog Family (Hylidae)

Pacific Treefrog (*Hyla Regilla*)

Iguanid Family (Iguanidae)

Zebra Tailed Lizard (*Callisaurus Dracondides*)
Desert Collared Lizard (*Crotaphytus Insularis*)
Leopard Lizard (*Gambelia Wislizenii*)
Desert Horned Lizard (*Pheynoaoma Platyrrhinus Aalidiarum*)
Sagebrush Lizard (*Sceloporus Graciosus*)
Desert Spiney Lizard (*Sceloporus Magister*)
Western Fence Lizard (*Sceloporus Occidentailis*)
Sideblotched Lizard (*Uta Stansburiana*)

Whiptail and Racerunner Family (Teiidae)

Western Whiptail (*Cnemipophorus Tigris*)

Snakes (Squamata Sub Serpentes)

Boa and Python Family (Boidae)

Rubber Boa (*Charina Bottae*)

Colubrid Snake Family (Colubridae)

Races (*Coluber Constrictor*)
Ringneck Snake (*Diadophis Punctatus*)
Night Snake (*Hypsiglena Turquata*)
Coachwhip Snake (*Masticophis Taeniatus*)
Striped Whipsnake (*Masticophis Taeniatus*)
Pine-Gopher Snake (*Pituophis Melanoleocus*)
Western Patch Nosed Snake (*Salvador Hextepia*)
Ground Snake (*Sonora Semiannulata*)

Western Aquatic (*Thamnophis Couchi*)

Westen Rattlesnake (*Crotalus Viridis*)