



**Department of
Community Development**

Master Plan Conservation Element



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**Department of
Community Development**

Master Plan Conservation Element

This document is one of a series that, as adopted, constitutes a part of the Master Plan for Washoe County, Nevada. This document is available for \$10.00 from the Washoe County Department of Community Development. If you have a copy of the Washoe County Master Plan notebook, please place this behind the Conservation Element tab. The Washoe County Master Plan can also be found on our department's website.

This printing of the Conservation Element reflects amendments adopted as part of Comprehensive Plan amendment Case Number CP10-002. In accordance with Article 820 of the Washoe County Development Code, this amendment was adopted by Resolution Number 10-11 of the Washoe County Planning Commission on May 20, 2010, by the Washoe County Commission on July 13, 2010, and found in conformance with the Truckee Meadows Regional Plan by the Regional Planning Commission on September 8, 2010. The adopting resolution was signed by the Washoe County Commission Chairman on September 9, 2010.

SECOND PRINTING, SEPTEMBER 2010

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Contents

	Page
Acknowledgments	vii
Introduction	1
Goals and Policies	3
Scenic Resources	3
Goal One	3
Policies	3
Goal Two	3
Policies	3
Land Resources	4
Goal Three	4
Policies	4
Goal Four	5
Policies	5
Goal Five	5
Policies	5
Goal Six	7
Policies	7
Goal Seven	7
Policies	7
Goal Eight	7
Policies	7
Goal Nine	8
Policies	8
Goal Ten	8
Policies	8
Goal Eleven	8
Policies	8
Goal Twelve	10
Policies	10
Goal Thirteen	11
Policies	11
Goal Fourteen	12
Policies	12
Goal Fifteen	13
Policies	13

	Page
Goal Sixteen	13
Policies	13
Water Resources	13
Goal Seventeen	13
Policies	13
Goal Eighteen	14
Policies	14
Goal Nineteen	15
Policies	15
Goal Twenty	16
Policies	16
Goal Twenty-one	16
Policies	16
Air Resources	16
Goal Twenty-two	16
Policies	16
Goal Twenty-three	18
Policies	18
Goal Twenty-four	18
Policies	18
Scenic Resources	19
Scenic Areas	19
Land Resources	21
Soils	21
Topography	22
Geologic Hazards	22
Geothermal Sites	23
Minerals	24
Vegetation	25
Wildlife and Wildlife Habitats	28
Threats to Land Resources	33
Agricultural Lands	34
Water Resources	35
Storm Water Quality	36
Flood Hazards	37
Wetlands	38

	Page
Air Resources	40
Conclusion	42
Appendix A – Maps	A-1
Bighorn Sheep Habitat	A-3
Black Bear Habitat/Range	A-5
Development Constraints/Suitability	A-7
Geologic Hazards	A-9
Mineral and Geothermal Resources	A-11
Mule Deer Habitat	A-13
Pronghorn Antelope Habitat	A-15
Raptor Habitat	A-17
Sage Grouse Habitat	A-19
Topographic and Scenic Features	A-21
Vegetative Communities/Landcover	A-23
Wild Horse and Burro Herd Management Area	A-25

List of Figures

Figure 1: Plant Communities Along an Elevation Gradient	26
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List of Tables

1. Threatened, Endangered and Candidate Fauna and Flora Species in Washoe County	32
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Introduction

Nevada Revised Statutes (NRS) Chapter 278.160 requires a conservation plan as part of any adopted master plan for counties with a population of more than 100,000 but less than 400,000, as is the case in Washoe County. NRS 278.160 states that a conservation plan is:

“For the conservation, development, and utilization of natural resources, including, without limitation, water and its hydraulic force, underground water, water supply, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals and other natural resources. The conservation plan must also cover the reclamation of land and waters, flood control, prevention and control of the pollution of streams and other waters, regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan, prevention, control and correction of the erosion of soils through proper clearing, grading and landscaping, beaches and shores, protection of watersheds, and the maximum tolerable level of air pollution.”

The Conservation Element of the Washoe County Master Plan serves as the conservation “plan” for unincorporated Washoe County and outlines policies and action programs for the conservation and preservation of natural resources. The plan also provides guidance to the Washoe County Planning Commission and the Washoe County Board of County Commissioners regarding their efforts to conserve natural resources while balancing the interests of growth and development. The Conservation Element was first adopted in 1991 and was comprehensively updated in 2008. Within the context of this planning document, the natural resources discussed and addressed include:

- **Scenic resources**, including but not limited to sites of unique scenic value, such as prominent rock outcroppings and ridgelines. Specific scenic resources will be identified through a methodology determined within a public process;
- **Land resources**, including but not limited to, soils, topography, vegetation, geologic hazards, geothermal sites, minerals, wildlife and wildlife habits, and agricultural/range lands;
- **Water resources**, including but not limited to, flood hazards, wetlands, and fisheries; and
- **Air resources**, including but not limited to, the attainment and maintenance of federal, state, and local standards for air quality in the Truckee Meadows.

It should be noted that several different planning documents, agencies, and regulations (including federal, state, and local) are often used to address or implement the required contents of a conservation plan cited in NRS 278.160. For example, many of the water resource issues cited above from NRS are currently addressed in Washoe County by regulations and policies contained in a variety of documents such as the Public Facilities and Services Element of the Master Plan, the Regional Water Management Plan (produced by the Northern Nevada Water Planning Commission and Department of Water Resources), and the Washoe County Development Code (Chapter 110 of the Washoe County Code of Ordinances). Readers should remain aware of these complex relationships and should endeavor to consult the appropriate documents for comprehensive guidance on respective issues. It is also important to understand that

the term “conservation,” as used herein, is generally used within a sustainable use context consistent with the intent of NRS, and can be defined as:

“The process through which natural resources are managed for individual, community or commercial use in accordance with principles that assure the optimum long-term economic and social viability of the resource base and the avoidance of undue, unacceptable, or excessive environmental damage.”

Goals and Policies

Scenic Resources

Goal One: Acquire, manage and maintain lands to protect scenic resources.

Policies

- C.1.1 The criteria by which lands are acquired for public use, particularly those acquired for the development of park sites, will be based in part on the conservation of scenic resources. When appropriate and if possible, scenic resources will be incorporated into the development of park sites.
- C.1.2 Washoe County will continue to support and participate in the management actions, efforts, and on-going projects of the Bureau of Land Management for the conservation and preservation of officially designated wilderness areas within Washoe County.

Goal Two: Conduct development so that an area's visual features and amenities are preserved.

Policies

- C.2.1 The Washoe County Department of Community Development shall maintain maps depicting valuable scenic areas, including but not limited to, prominent ridgelines, playas, and other unique scenic features. These maps shall be used to determine, in part, the land use and public services and facilities appropriate for each planning area. These maps, which may be specific to and contained within each Area Plan, shall also be used during development review to identify areas where scenic resource assessment and possible mitigation measures may be required.
- C.2.2 At the direction of the Board of County Commissioners, and if desired by planning area residents, the Washoe County Department of Community Development will prepare and implement design guidelines and standards specific to each planning area that will protect the scenic resources, provided:
- a. The guidelines or standards do not have the affect of being discriminatory, either financially or socially;
 - b. The guidelines or standards do not conflict with provisions of private Conditions, Covenants and Restrictions (CC&Rs), homeowners associations, etc., but if conflicts do arise, the more stringent standard applies, if applicable; and,
 - c. The guidelines or standards do not conflict with other plans, policies, or regulations.
- C.2.3 Each development proposal shall be evaluated with the intent to preserve visually prominent ridges and escarpments. Evaluation shall address mitigation of the affects on visual appearance, scarring of hillsides, and the impact of increasing access in roadless areas.
- C.2.3.1 The Washoe County Department of Community Development will request project design elements (e.g. clustering of buildings, visual or aesthetic standards, and

buffering) in areas found to have scenic value in order to avoid loss or degradation of the resource.

- C.2.3.2 Setbacks shall be encouraged during development review when the proposed development is near a prominent natural feature, or where the downward slope is undeveloped or has limited development potential.
- C.2.3.3 New billboards, signage and exposed utility poles that contribute to visual clutter shall be discouraged during development review. Utilities shall be placed underground where possible.

Land Resources

Goal Three: Regulate or mitigate development to protect environmentally sensitive and/or critical land, water and wildlife resources that present development hazards or serve highly valuable ecological functions.

Policies

C.3.1 The Washoe County Department of Community Development shall adequately consult with other agencies while maintaining Development Suitability maps that depict valuable and/or critical land, water and wildlife resources or features which shall include, but not be limited to, the following:

- a. Geothermal and mining areas.
- b. Landslide, avalanche and rockfall areas.
- c. Active and potentially active faults, and areas of potential groundshaking.
- d. Slopes greater than 15 percent.
- e. Sensitive soils.
- f. Key wildlife habitats and migration routes.
- g. Wild fire hazard areas (as specified by the respective fire agency).
- h. One hundred year floodplains.
- i. Perennial and intermittent streams, and wetlands.

This map series shall be used to determine the land use and public services and facilities appropriate for each planning area. These maps shall also be used during development review to identify areas where more detailed land and water resource information is needed. Where the information indicates a need, measures to protect these resources shall be required. The maps depicting development constraint areas and areas of biodiversity should be used as a reference tool only in reviewing development applications.

C.3.2 The Washoe County Department of Community Development will ensure that the Washoe County Development Code provides appropriate

guidelines and standards for development projects to minimize the following:

- a. Erosion and sedimentation on site, both during and after development.
- b. Destruction of natural topographic features that enhance the character of the area.
- c. Damage to habitats of threatened and endangered species.
- d. Destruction or damage to vegetated buffers along water resources and wetlands.
- e. Production of public health vector hazards.

C.3.3 The Washoe County Department of Community Development will take natural constraints into account on a site-by-site basis during development review. When technical review of a proposed development discloses localized conditions such as unstable slopes or poor soil conditions, development will be reduced from the normally allowed maximum, clustering may be proposed as an alternative where appropriate, and other conditions may be imposed, both to avoid natural hazards and to protect valuable environmental features.

C.3.4 Washoe County will limit development within the Development Constraints Area in accordance with the Truckee Meadows Regional Plan.

Goal Four: Facilitate land exchanges, acquisitions and disposals when they are in the public interest.

Policies

C.4.1 Washoe County will encourage and support land exchanges, acquisitions and appropriate disposals by the U.S. Forest Service and the Bureau of Land Management when such actions are in the public interest.

C.4.1.1 The Washoe County Department of Community Development and other appropriate County departments will work with the U.S. Forest Service and the Bureau of Land Management, as requested, to identify parcels whose exchange would be in the public interest, provided that the exchange, acquisition or disposal would not result in detrimental effects to scenic or natural resources.

Goal Five: Regulate development in hillside and mountainous areas to mitigate drainage, erosion, siltation and landslide problems.

Policies

C.5.1 The Washoe County Department of Community Development, together with the Washoe County Department of Public Works, will amend hillside development and grading regulations in the Washoe County Development Code to meet the intent of the policies of this element. The regulations will protect public health and safety, protect property, and

conserve the visual character of the land. These regulations will include, but not be limited to, the following items as outlined in the Truckee Meadows Structural Controls and Truckee Meadows Construction Site Best Management Practices Handbooks:

- a. Integration of development with the existing topography, soils and vegetation to the degree possible.
- b. Minimization of soil exposure during the heavier runoff period by proper timing of grading and construction.
- c. Retention of natural vegetation whenever feasible.
- d. Vegetation of and mulching of denuded areas to protect them from winter precipitation and erosion caused by wind and water.
- e. Diversion of runoff away from steep, denuded slopes or other critical areas with barriers or ditches.
- f. Preparation of drainageways to handle concentrated or increased runoff from disturbed areas by using erosion control measures.
- g. Trapping of sediment-laden runoff in basins to allow soil particles to settle out before flows are released to receiving waters.
- h. Inspection of sites to ensure control measures are working properly, and correction of problems as needed.
- i. Minimization of erosion and slippage on man-made slopes by requiring appropriate planting or mechanical means to maintain and stabilize cut and fill slopes, and limitation of cut and fill slopes to the maximum that is feasible for the planned stabilization method.
- j. Development of appropriate guidelines on the size of areas to be graded or used for building.
- k. Development of guidelines for prevention of wind erosion.
- l. Development of guidelines for temporary measures to minimize erosion during construction.

C.5.2 Slope management strategies for slopes between 15 and 30 percent will ensure that:

- a. Development on such slopes incorporates on-site and off-site mitigation measures for impacts to habitat and water quality, and for fiscal effects associated with higher-than-normal costs of infrastructure, public safety facilities, and public safety services;
- b. Recharge areas are protected; and
- c. Activities comply with the terms of National Pollutant Discharge Elimination System (NPDES) permits.

C.5.3 During development review, the Washoe County Department of Community Development will ensure maximum retention of trees and other vegetation which stabilize steep hillsides, retain moisture, prevent erosion, and enhance the natural scenic beauty, and, where necessary, require additional landscaping and/or revegetation.

- C.5.4 During development review, the Washoe County Department of Community Development will encourage cluster development, as appropriate, to minimize the need for grading roads in hilly areas.

Goal Six: Regulate development to protect the riparian vegetation associated with the Truckee River and the streams, creeks and wetlands of the region.

Policies

- C.6.1 In order to protect vegetation along streams and the Truckee River, the Washoe County Department of Community Development will implement Article 418, Significant Hydrologic Resources, of the Washoe County Development Code, adhering to the standards put forth to protect the Significant Hydrologic Resources of the County.
- C.6.1.1 During preliminary development review, the Washoe County Department of Community Development will ensure that development plans incorporate the standards outlined in Article 418, Significant Hydrologic Resources, for any property containing perennial streams.
- C.6.1.2 To further reduce risk to the natural vegetative communities along the County's hydrologic resources, in addition to the provisions and protections contained in Article 418, Significant Hydrologic Resources, the Washoe County Department of Community Development shall require the use of construction site best management practices (Appendix A – Cooperative Extension Fact Sheet-03-59) for the prevention of noxious weed spread for any construction occurring within a Critical or Sensitive Stream Zone Buffer Area.

Goal Seven: Promote the use of designated plants appropriate to the type of development.

Policies

- C.7.1 The Washoe County Department of Community Development will develop a landscape planting checklist and guide that will be used as an information source. This list will include, but not be limited to, plants appropriate for Low Impact Development (LID) projects/practices.

Goal Eight: Design and construct roads in outlying areas to satisfy multiple management objectives.

Policies

- C.8.1 The Washoe County Department of Community Development will require new developments in outlying areas to establish firebreaks, and relocate and/or maintain fire roads when such roads are impacted by the development.
- C.8.2 Washoe County will work with the U.S. Forest Service and/or Bureau of Land Management (BLM) to adopt consistent and complementary road

standards for developments within the boundaries of the National Forest or BLM lands.

C.8.2.1 The Washoe County Department of Community Development, in conjunction with the U.S. Forest Service, Bureau of Land Management and other appropriate entities, will develop road standard recommendations for local government adoption.

C.8.2.2 The Washoe County Department of Community Development will require adequate, deeded and well-signed public access to all developments proposed on private lands adjacent to or within National Forest or BLM lands during development review.

Goal Nine: Protect the County's forested lands by preventing inappropriate uses on private lands adjacent to lands administered by the U.S. Forest Service and the Bureau of Land Management.

Policies

C.9.1 The Washoe County Department of Community Development will work cooperatively with the U.S. Forest Service and the Bureau of Land Management to develop standards which regulate land uses on private land adjacent to or within the National Forest and the public domain.

Goal Ten: Incorporate technical information on geologic hazards into the land use planning and development processes.

Policies

C.10.1 The Washoe County Department of Community Development will review areas that possess severe geologic hazards and in which public safety may be jeopardized and, if appropriate, plan these areas for minimal or no development.

C.10.2 Prior to the approval of a development proposal, the Washoe County Department of Community Development will require geologic reports that identify potential hazards. In areas where geologic hazards are identified, extensive soil, hydrology, and engineering studies must clearly demonstrate that the proposed development will not result in avoidable public costs and will not pose significant risk of earthquake, landslide, erosion, sedimentation and drainage problems.

Goal Eleven: Manage the use, extraction and development of geothermal, wind, and solar resources in a sustainable and compatible way that protects both the resource and surrounding land uses.

Policies

C.11.1 Washoe County will promote geothermal development, except where mitigation measures will not protect the existing air and water quality standards.

- C.11.2 Washoe County will apply adequate standards to govern all phases of geothermal exploration and development, including the restoration of all such areas once the resource becomes nonproductive.
 - C.11.2.1 The Washoe County Department of Community Development, in conjunction with existing or newly created public and private agencies, and individuals, will identify and document standards for use of geothermal resources, disposal of any resulting waste, and reclamation of geothermal sites. Until such standards are available, the Washoe County Department of Community Development will review all proposals for geothermal resource development to encourage its full potential and to ensure that adverse environmental impacts are avoided.
 - C.11.2.2 The Washoe County Department of Community Development will require the developer of geothermal resources to comply with local, state and federal laws and regulations governing the disposal of geothermal fluids. Before approval is given for resource development, a disposal plan must be submitted to and approved by the Washoe County Board of County Commissioners.
- C.11.3 Washoe County will encourage the development of wind energy collection and production infrastructure.
 - C.11.3.1 The Washoe County Department of Community Development will require that wind turbines address, through appropriate design, the unique land use characteristics of the County.
 - C.11.3.2 The Washoe County Department of Community Development will require proposed wind energy development to address significant impacts caused by wind turbine wake effects upon existing and approved downwind wind turbines.
 - C.11.3.3 Other renewable resources such as solar generators, energy storage, distributed generation and cogeneration should complement wind energy uses. Limited industrial and commercial uses, serviced by alternative energy, where appropriate and consistent with existing residential uses should develop within portions of existing and future wind parks.
- C.11.4 Washoe County will encourage the development of active solar energy collection and production infrastructure.
 - C.11.4.1 Washoe County Department of Community Development will require that solar panels address, through appropriate design, the unique land use characteristics of the County.

- C.11.5 Washoe County will encourage site orientation of all structures that maximizes the use of passive solar energy. Site orientation should be consistent with visual impact policies.
 - C.11.5.1 The Washoe County Development Code shall be amended to provide standards for passive solar energy measures.
- C.11.6 As further outlined in the Land Use and Transportation Element (LUTE) Goal Nineteen, promote the use of green building technologies in development wherever possible to preserve natural resources.

Goal Twelve: Manage the use, extraction and development of mineral resources in a sustainable and compatible way that protects both the resource and surrounding land uses.

Policies

- C.12.1 Washoe County will require that mineral extraction, including aggregate, operations be performed in a way that is compatible with surrounding land uses and minimizes adverse effects on the environment.
 - C.12.1.1 As appropriate, the Washoe County Department of Community Development will require extractive operations to meet the following conditions prior to approval:
 - a. Preservation of topsoil.
 - b. Protection of surface and subsurface water.
 - c. Mitigation of natural vegetation, wildlife habitats and fisheries.
 - d. Control of erosion.
 - e. Control of drainage and sedimentation.
 - f. Provision of visual and noise buffering.
 - g. Accommodation of heavy traffic on roadways.
 - h. Provision of restoration and reuse of the site.
 - i. Provision of a phased bonding program and liability commensurate with total costs of requirements imposed.
 - j. Mitigation of the recreation opportunities, air quality, archaeological resources, character of the area, and other conditions as necessary.
 - C.12.1.2 The Washoe County Department of Community Development, in conjunction with existing or newly created public and private agencies, and individuals, will develop guidelines for inclusion in the Washoe County Development Code in order to provide adequate fencing and landscaping for extraction sites that are visible from incompatible land use areas.

- C.12.2 The Washoe County Department of Community Development will prohibit or regulate mineral extraction wherever it is determined that there may be significant, unavoidable adverse effects on groundwater quality.
- C.12.3 The Washoe County Department of Community Development, together with other appropriate County agencies, will develop regulations for inclusion in the Washoe County Development Code to require and assure site reclamation as a condition of extraction approval.

Goal Thirteen: Protect key wildlife resources.

Policies

- C.13.1 Protect key wildlife habitats; habitats of threatened, endangered or rare species; and key migration routes.
- C.13.1.1 The Washoe County Department of Community Development will work with the Nevada Department of Wildlife, Nevada Division of Parks, and the Washoe County Regional Parks and Open Space and District Health Departments, and other appropriate agencies to suggest high priority lands to be identified for acquisition in the Washoe County Open Space and Natural Resource Management Plan, and further, to facilitate implementation of this Plan once adopted. These lands will include key wildlife habitats, habitats of threatened and endangered species, and areas of scientific, educational or high aesthetic value.
- C.13.1.2 The Washoe County Department of Community Development will continue to partner with existing or newly created public and private agencies and individuals to identify methods for conservation of key wildlife habitats, habitats of threatened or endangered species, and cultural resources, and implement direction from the Washoe County Open Space and Natural Resource Management Plan regarding conservation of these resources.
- C.13.2 Promote the conservation and enhancement of fishery and wildlife resources; areas of high wildlife value; areas necessary for the protection and perpetuation of rare, endangered and threatened species; and areas important for scientific study.
- C.13.2.1 In key wildlife habitat areas, the Washoe County Department of Community Development will submit major development proposals to the appropriate state or federal agencies for review of possible damage to wildlife habitats, to include potential mitigation measures, and conformance with laws concerning endangered species.
- a. The Washoe County Department of Community Development will not approve any development in known or suspected habitat of a species listed as

endangered until a detailed study, reviewed by the US Fish and Wildlife Service, proves otherwise.

C.13.2.2 The Washoe County Department of Community Development will discourage any development that would have significant adverse impacts on:

- a. Any species identified as rare, endangered, or threatened by the State of Nevada or the U.S. Department of Interior.
- b. Any valuable and unique natural resource or habitat, unless there are significant overriding concerns for the public health vector, safety and welfare. The project sponsor shall demonstrate what, if any, adverse impact will be incurred by any species and what mitigating measures will be provided to offset any losses.

C.13.3 Ensure that all existing natural streams, playas and other water bodies are recognized for their wildlife habitat, floodway, water quality enhancement and scenic value.

C.13.3.1 Maintain open space along stream channels to protect riparian habitats.

C.13.3.2 Preserve vegetated buffers along water resources and wetlands.

C.13.4 Protect the following areas as important recreational and wildlife areas:

- a. Washoe Lake.
- b. Swan Lake Nature Study Area.
- c. Sheldon Antelope Refuge.
- d. High Rock Canyon.

Goal Fourteen: Protect sensitive and important lands in developing areas through appropriate development techniques.

Policies

C.14.1 In developing areas protect prime agricultural lands that should remain open for other considerations. This includes lands:

- a. Not planned to receive urban services.
- b. Subject to safety risks, such as flooding.
- c. Contributing to groundwater recharge and protection of the watershed.
- d. Appropriate for the containment of urban sprawl and to provide a buffer between urban and suburban/rural areas, or between incompatible land uses.
- e. Serving the public good through the aesthetic, cultural and scenic benefits that open space provides.

Goal Fifteen: Conduct development in such a way that the threat of wildfires is reduced.**Policies**

- C.15.1 Encourage incorporating into development projects the standards contained in “Wildfire Threat Reduction Recommendations for Nevadans” (published by the Living With Fire Program, <http://www.livingwithfire.info/>), where appropriate.

Goal Sixteen: Develop a green space network.**Policies**

- C.16.1 Through the adoption of the Open Space and Natural Resource Management Plan and implementation of the policies contained in the Land Use and Transportation Element, Washoe County will promote and facilitate recreational use of green space by pedestrians and bicyclists, and provide access to public facilities, recreation, public transportation and open space.

Water Resources***Goal Seventeen: Protect and improve existing water quality.****Policies**

- C.17.1 Washoe County will review applicable wellhead protection plans and consult with the water purveyors when reviewing development proposals to determine if there is a conflict between the proposed development and a wellhead protection zone that poses a risk that cannot be reasonably mitigated or addressed in the development process. Water purveyors are encouraged to develop wellhead protection programs that can be integrated with local government new business or development review processes.
- C.17.2 Natural groundwater recharge areas shall be defined, identified and protected for aquifer recharge. Proposed projects and proposed land use changes in areas with good recharge potential shall be required to include project features or adequate land for passive recharge.
- C.17.2.1 Washoe County shall perform a review of lands within proposed project or proposed land use change area and rank suitability for passive recharge based on site evaluation criteria (see Northern Nevada Water Planning Commission [formerly Regional Water Planning Commission] Southern Washoe County Groundwater Recharge Analysis (Kennedy-Jenks Consultants, January 2001). Sites with a Hydrology/Geology matrix score of 2.2 or higher are considered to be sites with “good recharge potential.”

*For additional information concerning water policies, please reference Washoe County Department of Water Resources, www.washoecounty.us/water/contact.htm.

If a site is determined to have “good recharge potential,” Washoe County shall, to the extent practicable, work with the project developer or land use change proponent to explore development features or configurations that maximize recharge while meeting other obligations regarding storm water quality and flood control needs.

- C.17.3 Washoe County Department of Water Resources will take a lead role in the remediation of contaminated groundwater. Continued beneficial use, potential human health concerns, or ecological impacts will be the main considerations for groundwater remediation efforts.
- C.17.4 When adverse surface or groundwater impacts occur as a result of a concentration of septic systems, alternative sewage disposal, groundwater treatment, or other techniques shall be implemented. The selection of techniques to achieve this performance standard shall be based on cost, longevity of the solution, and existence of a credible entity to be responsible for the continuing performance of the selected system. Future individual septic systems shall not be allowed when ground or surface water contamination will result from their use.
- C.17.5 A uniform storm water quality program shall be implemented region-wide to address not only urban runoff but also other non-point source contributions, including the continuation and/or enhancement of existing programs in the region, such as the Truckee Meadows Regional Storm Water Quality Management Program. Deviations from a uniform program may be necessary to reflect varying local conditions and interpretations of federal law.

Goal Eighteen: Manage and utilize water resources in a fair and sustainable manner.

Policies

- C.18.1 Use of Truckee River water rights shall be limited to the hydrographic basins historically receiving Truckee River water. Use of Truckee River water rights in additional hydrographic basins shall be allowed only to the extent that such uses:
- a. Are an efficient use of water resources;
 - b. Meet or satisfy all regulatory requirements and operating agreements;
 - c. Maintain or improve water quality for downstream users;
 - d. Maintain a healthy river environment, provide a recreation attraction for residents and tourists, and offer a focus for economic/tourism development.
- C.18.2 Water conservation programs shall be implemented to the extent that they are shown to be cost effective when water, wastewater, and environmental benefits are weighed against implementation costs.
- C.18.3 Mandatory water demand reductions, in conformance with applicable local ordinances, may be implemented in times of drought or emergency

- in order to allow existing supplies to meet the critical water needs of the community.
- C.18.4 Conserved water originating from the Truckee River shall be managed consistent with agreements among local entities and parties of interest to the Truckee River, including but not limited to the Truckee River Operating Agreement to the extent that it becomes effective.
- C.18.5 For planning purposes, the conjunctive management of surface water and groundwater supplies for municipal and industrial use shall be designed to withstand the worst drought cycle of record.
- C.18.6 New water resources, including imported water, may be developed provided they further the goals of the Regional Plan and the Regional Water Management Plan.
- C.18.7 Subject to existing state and local regulatory review, new water supply commitments, including utility will-serve letters and the creation of domestic well lots and parcels, may not be issued against a water resource or combination of resources above and beyond the perennial yield. In basins where water resource commitments equal or exceed the perennial yield, commitments for new uses may be made using water rights derived from the elimination of prior existing beneficial uses of water or through the use of imported water sources. Area Plans may impose additional requirements related to balancing water resources with commitments.
- C.18.8 The use of reclaimed wastewater for irrigation, recharge or other permitted uses shall be pursued to the extent that such use is an efficient use of water resources and water rights. To the extent that reuse water is available to meet a new proposed non-potable water demand that is consistent with the use of reclaimed water, potable water shall not be supplied to meet the demand.

Goal Nineteen: Use a watershed planning approach to preserve and enhance wetlands.

Policies

- C.19.1 During development review, the Washoe County Department of Community Development will require documentary evidence of compliance with the requirements of the Federal Clean Water Act and any other federal wetland regulations.
- C.19.2 During development review, the Washoe County Department of Community Development will review development proposals adjacent to wetland areas to ensure compatibility.
- C.19.3 During development review, priority will be placed on preservation of existing wetlands rather than mitigation sites or the development of replacement wetlands.

Goal Twenty: Regulate development to protect floodplains.**Policies**

- C.20.1 Restrict development in floodplains that would constrict or otherwise result in higher floodwater levels or peak flows, or impact to floodplain functions.
- C.20.1.1 The Washoe County Department of Community Development shall use the Federal Emergency Management Agency (FEMA) Flood Insurance maps as the basis for delineation of floodplains and floodways, unless more recent research and surveys are presented which establish a more accurate delineation.

Goal Twenty-one: Manage development to preserve and protect water resources.**Policies**

- C.21.1 To protect water quality, minimize erosion and sedimentation, and preserve natural drainage functions, riparian habitat and aesthetic values, Washoe County shall promote design and construction practices, contained in the Truckee Meadows Structural Controls Design Manual (a component of the Storm Water Quality Management Program that is mandatory under the National Pollutant Discharge Elimination System Permits issued to the Cities of Reno and Sparks and Washoe County), that:
- a. Mimic pre-development hydrology.
 - b. Control storm water as close to the source as possible.
 - c. Facilitate storm water detention and infiltration.
 - d. Distribute small scale storm water control features throughout the landscape of individual construction sites.
 - e. Limit impervious surfaces.
 - f. Limit the continuity of impervious surfaces.
- C.21.2 Recognizing riparian areas and playas for their wildlife habitat, floodway, water quality and quantity enhancement, and scenic value, Washoe County will ensure that development is compatible with these primary uses and consistent with federal guidelines.

Air Resources**Goal Twenty-two: Reduce mobile source emissions so that Washoe County air quality meets federal, state and local ambient air standards for all pollutants.****Policies**

- C.22.1 Washoe County shall work to reduce mobile source emissions by coordinating with other agencies as identified below.
- C.22.1.1 Encourage the Nevada Department of Motor Vehicles to enhance the current motor vehicle inspection and

- maintenance program by expanding it into surrounding communities.
- C.22.1.2 Encourage the Truckee Meadows Regional Planning Agency to use its planning authority to develop an urban form that minimizes the growth of vehicle miles traveled.
- C.22.1.3 Encourage the Truckee Meadows Regional Planning Agency to request changes in State Law (NRS 445.493) to require that "Projects of Regional Significance," as a part of their application for development approval, include a quantified analysis of their impact on regional air quality and mitigation in the event that air quality standards are exceeded.
- C.22.1.4 Encourage the Nevada Department of Motor Vehicles to maintain and enhance the diesel vehicle inspection and maintenance program.
- C.22.1.5 Encourage the Nevada Department of Motor Vehicles to maintain and enhance the current Visible Smoke Emission Program.
- C.22.1.6 Encourage the Washoe County District Health Department to maintain and enhance the existing Washoe County oxygenated fuel program.
- C.22.1.7 Encourage Washoe County fleet vehicle operators to continue to convert to alternative clean burning motor vehicle fuels (e.g. electric, hydrogen, propane, natural gas, biodiesel, ethanol, methanol, etc.).
- C.22.1.8 Encourage the Regional Transportation Commission to coordinate the implementation of a Regional Employer-Based Trip Reduction Program that will reduce the growth of vehicle miles traveled.
- C.22.1.9 Encourage the Washoe County District Health Department to maintain and enhance the existing diesel motor vehicle idling restrictions and to develop diesel fuel sulfur content regulations.
- C.22.1.10 Encourage the U.S. Environmental Protection Agency to maintain the current schedule for introduction of clean-burning diesel engines in buses and heavy-duty trucks.
- C.22.1.11 Encourage the State of Nevada to adopt stricter motor vehicle emission standards for new cars sold in Washoe County.
- C.22.1.12 Encourage the use of alternative transportation modes (RTC Ride, ridesharing, van pooling, bicycling, etc.) as a means to reduce the growth of vehicle miles traveled.

Goal Twenty-three: Reduce stationary source emissions so that Washoe County air quality meets federal, state and local ambient air standards for all pollutants.**Policies**

- C.23.1 Washoe County shall establish a program to pave unpaved roads and control parking in areas that are unpaved.
- C.23.2 Washoe County shall encourage the use of clean burning fuels and renewable energy (e.g. solar energy, wind energy, etc.) for space heating and water heating purposes.
- C.23.3 Washoe County shall continue to use high efficiency street sweepers that will control street-related particulate matter emissions.
- C.23.4 Washoe County shall encourage the Washoe County District Health Department to:
- a. Maintain and enhance the existing fugitive dust, material transport, and deicing control regulations.
 - b. Maintain and enhance the existing Green, Yellow, Red wood burning program; the wood burning device emission standard regulation; the wood burning device replacement program; and the prohibition of wood burning devices in new construction.
 - c. Maintain the current requirement for Stage II vapor recovery systems at all gasoline stations.
 - d. Investigate the feasibility of using alternative fuels (e.g. electric) for railroads in the non-attainment area.
 - e. Maintain and enhance the existing wood burning device density regulations for outlying areas.

Goal Twenty-four: Manage air pollutant emissions from all sources so that Washoe County air quality meets federal, state and local ambient air standards.**Policies**

- C.24.1 The Washoe County District Health Department will continue to establish meteorology and air quality sampling stations in each of the urbanized air sheds within Washoe County and annually report on the air quality trends.
- C.24.2 Washoe County shall encourage the implementation of policies and practices that reduce energy consumption.
- C.24.1 Within the Truckee Meadows Service Area (as defined in and by the Truckee Meadows Regional Plan), Washoe County will prohibit the use of diesel oil fueled, internal combustion power generation units synchronized with the regional electric grid, except for emergency conditions, unforeseen grid disturbances, maintenance activities or transmission limitations.

Scenic Resources

Washoe County's heritage is reflected in its many cultural resources, defined here as archaeological resources, and architecturally significant and historic places. These resources, formerly covered in this Element, will henceforth be included in a separate Historic Preservation Element.

Of equal importance are the scenic opportunities afforded in the County, including mountains, deserts, canyons, playas and lakes. These resources contribute to an aesthetically diversified environment, provide educational and scientific opportunities, provide important tourism attractions and economic development opportunities, and make the County an attractive place to live and work, and contribute to the County's unique character.

Scenic Areas

Washoe County offers a wide variety of scenic attractions for both residents and visitors. The open spaces, clean air and natural resources attract many people who want to get away from urban congestion. Old mining camps and ghost towns serve as reminders of Nevada's past. These scenic areas can be viewed through a variety of methods including driving, hiking, walking, bicycling, boating and ski touring. Major natural scenic areas of interest include High Rock Canyon, Smoke Creek Desert, Black Rock Desert, Pyramid Lake, Lake Tahoe, Washoe Lake, the Truckee River, and the numerous mountain ranges and peaks found throughout Washoe County (See Topographic and Scenic Features map.) Significant geothermal resources also exist in Washoe County that have great recreational and scenic appeal, as well as energy production potential. However, these geothermal areas must be approached with caution and used with care as extremely hazardous temperatures occur at some locations and some sites can also be either environmentally or culturally sensitive.

The northern portions of Washoe County contain numerous wilderness areas of national importance. These wilderness areas surround the historic California emigrant trail segments that pass through the area and have remained virtually unchanged for more than 150 years since the pioneers first made their way to California. These areas provide outstanding scenic opportunities due to their rugged terrain, large size and undeveloped nature, and also offer the opportunity to experience a natural, primitive, and solitary experience. First designated as "wilderness study areas" by the federal government in 1980, these areas have been managed on an interim basis by the BLM over the last 20 years to preserve their wilderness-like values.

On December 21, 2000, the President signed the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area Act of 2000 (the "Act"), which was enacted by Congress to create special designations for 1.2 million acres of public lands managed by the Bureau of Land Management in northwestern Nevada. The Act protects about 120 miles of emigrant trails, from Rye Patch Reservoir, north through the Black Rock Desert and Mud Meadows, and then west through Fly Canyon and High Rock Canyon, ending near Vya, Nevada. In addition, the Act designates 815,000 acres as a National Conservation Area (NCA), and within the NCA there are nearly 380,000 acres that are designated "Wilderness." There are also about 375,000 acres designated Wilderness outside of the NCA, bringing the entire area (NCA and Wildernesses) to approximately 1.2 million acres. A portion of this acreage is located within the boundaries of Washoe County (see Topographic and Scenic Features map).

The federal NCA and Wilderness designations for these areas will help to ensure that one of the last nationally significant segments of the historic California emigrant trails, along with other prominent national resources such as Black Rock Desert and High Rock Canyon, will be protected. Ten wilderness areas surrounding portions of the California emigrant trail have been designated through this process. These areas include the Black Rock Desert Wilderness, North Jackson Mountains Wilderness, South Jackson Mountains Wilderness, Paiute Peak Wilderness, North Black Rock Range Wilderness, East Fork High Rock Canyon Wilderness, High Rock Lake Wilderness, Little High Rock Canyon Wilderness, High Rock Canyon Wilderness, and the Calico Mountains Wilderness. Located almost entirely within the boundaries of Washoe County are the High Rock Canyon, Little High Rock Canyon, and the East Fork High Rock Canyon Wilderness areas.

The Act involves more, however, than the preservation of historic emigrant trails and the designation of wilderness areas. For example, the Black Rock Desert Playa (dry lakebed), a remnant of ancient Lake Lahontan, comprises a large portion of the NCA and is the traditional site of the world-renowned Burning Man festival. The playa is also known as the proving grounds for the land speed record, and is popular for many types of recreation. Livestock grazing has been an historic use in the area and will continue within the NCA, which encompasses 10 existing livestock grazing allotments managed by the BLM's Winnemucca Field Office and 12 allotments managed by the Surprise Field Office. Permitted recreation events, such as the Burning Man festival, will continue within the NCA. Except for valid existing rights, NCA lands are withdrawn from mineral development. The Act also calls for protecting unique plant and animal species and cultural and natural resources. Changes for off-highway vehicle (OHV) use in the conservation area will also occur, but use of motorized vehicles will continue to be permitted on roads, trails, and other areas designated for their use. Designated areas remaining open to OHV use include approximately 800 miles of roads and trails and the playa of the Black Rock Desert.

The associated wilderness areas will be managed by the BLM in accordance with the Wilderness Act of 1964 and the Federal Land Policy and Management Act (FLPMA) of 1976. For more details on specific management provisions, see *The Black Rock Desert – High Rock Canyon Resource Management Plan (RMP)* that was approved by the Bureau of Land Management State Directors in Nevada and California on July 22, 2004. This document provides overall guidance for the management of lands within the NCA, wilderness areas, the South Playa and the Lahontan Cutthroat Trout (LCT) area. The RMP can be viewed at the BLM's Winnemucca field office website.

Many other wild land scenic resources exist in Washoe County in addition to the Black Rock Desert – High Rock Canyon NCA. A portion of the Sheldon National Wildlife Refuge is located in the northeastern corner of Washoe County along the Nevada-Oregon state border. This refuge, which is focused on preservation of pronghorn habitat, offers exceptional wildlife viewing opportunities.

Land Resources

The land is an integral part of the environment for plant and animal life as well as for human settlement. The economic well-being of Washoe County is dependent on the land, either directly from agriculture and mineral extraction or indirectly through development upon the land, and tourism and economic development opportunities. In addition, the health of the County's citizens is related to the quality of natural resources. To ensure that land resources are not degraded or destroyed, development must occur in a fashion that recognizes the importance of soils, topography, vegetation, geologic hazards, geothermal sites, minerals, wildlife habitats, and agricultural lands.

Soils

The characteristics of the soils in an area determine what kinds of challenges may be faced as land is developed. These challenges generally relate to erosion. The types of soils present also determine opportunities for structural non-structural controls related to low impact development principles that can be incorporated into development plans.

Erosion Hazards

The majority of the soils identified in Washoe County are subject to moderate to severe erosion. The zones of heavy erosion potential are shown on the Development Suitability maps.

Erosion can be reduced by shallower slopes which reduce the velocity of surface water, and the presence of vegetation which tends to increase the absorption of surface water and to trap soil particles. While a certain amount of erosion always occurs naturally, the actions of man, including grading, removal of vegetation, and the placing of large impervious surfaces (e.g. buildings and pavement) on the land, radically accelerate erosion. Steeper slopes, combined with unstable soils and subsoils, are highly conducive to erosion and siltation during construction activity and before ground cover is established. The introduction of invasive weed infestations on disturbed ground is also a cause of erosion associated with construction activities, since the root systems of these introduced plants are not designed to hold the soil as native plants are.

Sediment from erosion caused by wind and water has widespread effects. It pollutes and obstructs natural and man-made drainage channels and storm drain systems. It also degrades water quality by increasing turbidity and introducing pollutants such as nutrients, pesticides, pathogens, and organic matter, which create an increased burden on water treatment facilities, and affect animal life by reducing the penetration of sunlight, coating the gills of fish, and covering bottom organisms. Dredging of sedimented channels can compound the water quality problem when the soil is disposed of improperly. To minimize the undesirable results of sedimentation from erosion, developments can either be limited to areas where erosion hazards are limited or required to practice mitigation measures.

Topography

The topography of the region can affect development in a number of ways. One of the most crucial aspects of topography is the amount of slope of the land. Generally speaking, the steeper the slope, the greater the challenges for development. Soils that tend to erode easily are more likely to do so on a steep slope because of the greater velocity of water runoff. Flat land, with slopes under three percent, offers few problems related to slope except that surface drainage may not be satisfactory. Gently sloping areas, from three to ten percent slope, are suitable for most types of development and normally have good surface drainage. Areas with slopes of 15 percent or greater are usually not readily suitable for development. In these steeply sloping areas, mitigation, including special design techniques and larger lots, is needed to ensure integration of development with the existing topography, soils, vegetation, and compatibility with slope constraints. Areas with slopes of 15 percent or greater are shown on the Development Suitability maps.

Washoe County encompasses a number of mountain ranges and valleys. In the northern part of the County, the Hay Canyon Range, the Granite Range, and the Sheldon Antelope Range are the most dominant mountains. They tower over nearby valleys up to 6,000 feet in some places. Long Valley, Duck Flat, part of the Smoke Creek Desert, and part of Black Rock Desert are the largest valley areas. In the southern part of Washoe County, the Fox Range, Lake Range, Truckee Range, Pah Rah Range, Virginia Range, and the Carson Range of the Sierra Nevada are the high mountains. Major valleys include the Truckee Meadows and Washoe Valley. The Topographic and Scenic Features map shows the ranges and valleys in Washoe County. Although there are numerous flat or gently sloping areas in the County, there will be continuing pressure to develop on sloped lands in developing valleys.

Geologic Hazards

Urban growth, especially in the Truckee Meadows, has resulted in developments in areas where geologic and engineering information is sparse. Some urban development has expanded into areas where geologic hazards, defined here as earthquakes, floods, landslides and avalanche, have historically occurred.

Earthquake Hazards

Western Nevada has had a seismically active history. As shown on the Seismic Risk Zone Map of the Western United States map, western Nevada is located in Seismic Risk Zone 3, which indicates that major damage could occur during an earthquake.

Studies conducted by the U.S. Coast Guard and Geodetic Survey and the Seismological Laboratory indicate that earthquakes with a magnitude great enough to be destructive have frequently occurred in western Nevada. In Washoe County, geologists have mapped hundreds of faults and a great many of these would have to be considered potentially active.

The populated Truckee Meadows area has experienced a number of earthquakes, one particularly destructive. The largest shock in the vicinity of Reno was that of April 24, 1914, which lasted ten seconds and caused some light structural damage. Two other earthquakes, in 1941 and 1953, caused limited damage. A series of mild and moderate earthquakes in January 1991 were centered in the southern part of Washoe Valley. Additionally, a second series of mild and moderate earthquakes have been occurring

since early 2008 near and within the Verdi planning area. Two principal geological factors which can be considered in design of domestic buildings and high rise structures in areas that are potentially subject to extensive earthquake damage are the location of pre-existing faults and the nature of unconsolidated deposits in valley areas. Since faults may be directly related to earthquakes, it is important to locate and identify them. Also, it is necessary to know the physical properties of materials on which a structure will rest in order to evaluate the behavior of the structure during a seismic event.

Landslides and Mudflows

Landslides have historically occurred in canyons, hillsides, ravines and alluvial fans, some of which are now occupied by development. Terrain modification can be controlled to prevent reactivation of landslides. For instance, grading for lots and streets and other modifications from filtration systems all affect slope stability.

Mudflows move relatively rapidly, have a high water content, usually follow stream channels, and spread across alluvial fans at the base of mountains. Mudflows are quite common in arid and semi-arid regions. The following conditions favor their formation: poorly consolidated to unconsolidated materials at the surface that become slippery when wet, steep slopes, abundant but intermittent supplies of water, and sparse vegetation. Mudflows are also more common where vegetation is sparse and the infrequent rains are torrential. More frequent wildfires, caused in part by increased cheatgrass infestations, have increased the amount of land where vegetation is sparse. It is important that the potential danger from the presence of these conditions be recognized prior to development.

Avalanche Hazard

Avalanches are a potential hazard in the higher elevations of the Carson Range. Conditions under which avalanches occur vary considerably and are not easily predicted; however, the conditions are closely related to topography, climate, vegetative cover, and the direction the land surface faces. Because it is very difficult to predict an actual avalanche, development should be restricted in areas with high avalanche potential to avoid possible loss of life and property.¹

Geothermal Sites

The U.S. Geological Survey has identified six major geothermal areas in Washoe County. These are Steamboat Hot Springs, Moana Hot Springs, Needles Rocks, Gerlach Hot Springs, Ward's Hot Springs, and San Emidio Desert Hot Springs. In addition to these major geothermal sites, many minor sites exist at various locations throughout the County. The more notable of these smaller geothermal sites include Lawton Hot Springs, Wedekind Mine, Bowers Hot Springs, and Pleasant Valley. (See Mineral and Geothermal Resources map.) All of the six major geothermal sites have great potential for development. The only limiting factor is that four of the six sites are situated in remote locations away from roads and other transportation facilities.

Uses for geothermal energy fall into two broad categories--electrical generation and direct use of the hot water. Electrical generation on a practical commercial scale requires both a high temperature resource and a large geothermal reservoir. Several of the geothermal areas in Washoe County meet these criteria.

¹ Although avalanches are not easily predicted, potential avalanche areas and flow directions have been derived for ski areas, for example.

As of August 2006, the Nevada Commission on Mineral Resources, Division of Minerals lists four power-generating geothermal plants operating in Washoe County – the Empire Power Plant in Empire and three plants in the Steamboat area south of Reno termed the Steamboat Geothermal Complex. The Steamboat Geothermal Complex, while within the boundaries of Washoe County, is now under the jurisdiction of the City of Reno. Other areas of activity include Gerlach, where a permit has been issued for electrical power generation and potential direct use, and the Pyramid Lake Paiute Reservation, which is being explored for geothermal development potential.

Direct uses of geothermal energy are more varied and can economically make use of lower-temperature, less-extensive resources. Essentially, direct uses of geothermal energy can be divided into six major categories: space heating (residential, district and industrial); low, medium and high process heat; domestic, commercial and industrial hot water; hot water for various agricultural needs such as drying crops and various animal husbandry operations; warm water for agricultural enterprises; and warm water for recreation. The heating of commercial and residential buildings appears to have the most promise for further application.

The nation's current search for additional sources for alternative energy development could affect many areas in the County. Hot springs scattered throughout the area have attracted the attention of agencies and individuals attempting to find geothermal energy sites. The temperature, quantity, and dissolved minerals of the water are some of the factors that determine whether, under present technology, development of a site is practical. To determine a site's energy potential, underground drilling is usually necessary and can be environmentally damaging. Damage can be minimized by strictly managing installation, location and types of construction. Considering scientific and technological achievements, it should be possible to tap and use geothermal energy with little destruction or alteration of the surrounding environment.

Minerals

Washoe County has a wide variety of mineral deposits. Of these, only a few have been produced at a significant scale. These mineral deposits and occurrences are diverse in type and geologic setting. (See Mineral and Geothermal Resources map.)

The principal metals produced in Washoe County have been gold, silver, lead, copper and zinc. Minor amounts of mercury, uranium, tungsten, arsenic and antimony have also been produced. Small deposits of tellurium, manganese, molybdenum, bismuth, titanium, thorium and other metals have been found in the County, but no commercial deposits of these metals have as yet been developed. Many of these metals have been recovered from Tertiary volcanic rocks.

In the future, the mining and processing of industrial rocks and minerals will probably become an industry of greater size and importance in Washoe County. The total value of halloysite clay, diatomite, lightweight aggregate, and sand and gravel production is greater than that of the pure metals produced in the County, and aggregate makes up much of these industrial minerals. In addition, unconsolidated calcium carbonate, common clays, feldspar, limestone, sodium chloride, borate, silica, and stone have also been produced. Other types of deposits present in the County, but which have not been produced at very significant levels, are montmorillonite clay, coal, perlite and sulfur. Also, gypsum, mined in Pershing County, is processed in Washoe County.

Playas and playa deposits have been the sources of borax, salt, sodium carbonate, sodium sulfate, and lithium in Nevada. In Washoe County, sodium chloride and sodium sulfate were produced around the turn of the century on a playa at Buffalo Springs on the west side of Smoke Creek Desert. Also, there have been unconfirmed reports of borate production near Gerlach Hot Springs during the 1980s. Aside from these two instances, the playas in Washoe County have been relatively unproductive, but they are a potential source of many mineral commodities.

The potential for development of mineral resources in remote sections of the County should grow as their value increases in today's marketplace. However, there has been a decrease in the filing of leases for oil and natural gas exploration in Washoe County since 1982. There are currently no leases or lease applications for oil and natural gas exploration filed for Washoe County. There may be potential for this trend to change, since in the last two years oil and gas speculation has increased dramatically in the state. Several factors contribute to this resurgence in interest: fluctuating oil costs causing a desire to locate more sources within the U.S., the 2005 federal energy bill including billions of dollars in incentives for oil and gas exploration and development, large amounts of oil discovered in Utah, and claims of large untapped potential in Nevada. Should these factors cause a trend reversal in Washoe County, then the potential impact of mineral extraction could be significant. It may lead to environmental degradation of relatively unspoiled portions of the County.

Increased residential development is often incompatible with the development of mineral resources. Existing mineral operations near developing areas must, therefore, be regulated to preserve water and air quality and to ensure compatibility between the operations and the surrounding residential areas. Since future extractive operations can be prevented when development occurs over mineral deposits, it is important to locate the valuable mineral resources early and, if practical, to prevent incompatible development on or near these resources.

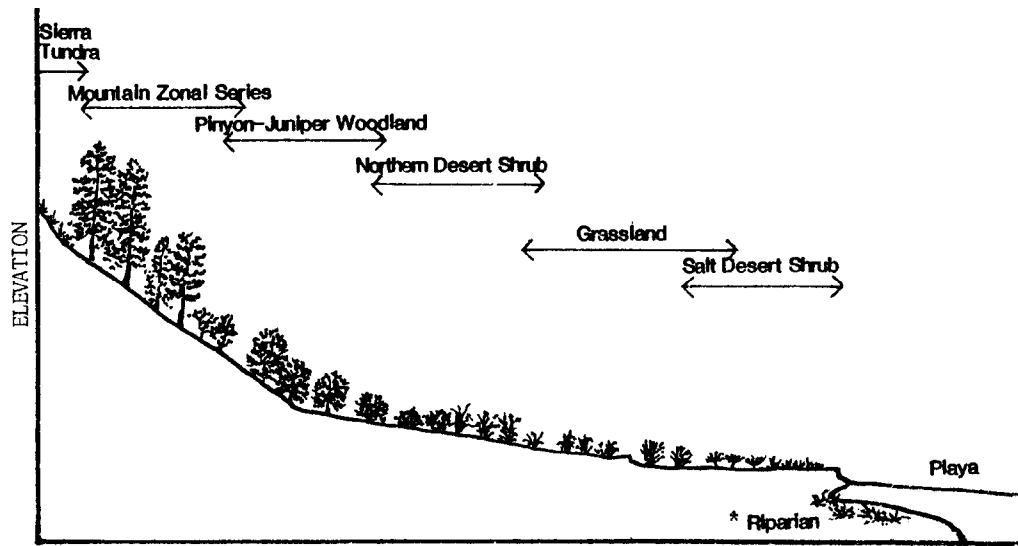
Vegetation

Vegetative Communities

Washoe County's topography, with its varied altitudes, has allowed numerous temperature and moisture regimes to develop. This has resulted in the establishment of a large number of distinct vegetative communities on an elevation gradient, as shown in Figure 1, as well as geographically, as shown on the Vegetative Communities/Landcover map.

Riparian – The riparian community provides a dense growth and density of plants ranging from large cottonwood trees, to moderate-sized cattails, to small water buttercups. This community also supplies wildlife with food, cover, protection from high temperatures, and nesting sites. In Washoe County, the riparian community is found along flowing streams such as Galena Creek and the Truckee River, in marsh areas such as Gerlach Hot Springs, and in areas of high groundwater.

Figure 1: Plant Communities Along an Elevation Gradient



Note: The riparian community could appear at any elevation along stream and river banks, lakeshores and spring discharge areas.

Source: Washoe County Department of Community Development

Salt Desert Shrub – Plants such as shadscale, greasewood, Russian thistle, saltgrass, and bud sagebrush are the most common plants found in the salt desert shrub community. This community is found in the Pyramid Lake area, the Smoke Creek Desert, and the San Emidio Desert.

Natural Grasslands – Within Washoe County, there are few natural grasslands (i.e. stands of vegetation that have no understory of shrubs or trees and only a few forbs intermingled). Along the edges of some salt desert shrub communities and playas, grasslands can be found. The grassland community is characterized by saltgrass, Indian ricegrass, bluegrass and wheatgrass. Two alien grasses, cheatgrass and a hybrid form of wheatgrass, are also present. Cheatgrass is prevalent in many places where wildfires have burned away sagebrush, and it has a high fire potential. Wheatgrass, which was developed by federal land management agencies and ranchers, provides supplemental spring-fall forage for livestock.

Northern Desert Shrub – The most abundant vegetative community found in Washoe County is the northern desert shrub community which occurs in most areas of the County. It includes sagebrush, rabbitbrush, bitterbrush, and Mormon tea. This shrub and brush community provides food and shelter for many species of wildlife including jackrabbits, squirrels, mice and other small rodents.

Pinyon-Juniper Woodland – The pinyon-juniper woodland community consists of low evergreen trees at higher elevations where rainfall exceeds 12 inches per year. The two principal tree species are the single-leaf pinyon pine and the Utah juniper. Usually, there is an understory of grasses and shrubs, though in areas where there is a high density of trees, the ground is usually bare. Stands with little or no understory of grasses are highly conducive to erosion. Sagebrush, rabbitbrush, bitterbrush and horsebrush are common to this community.

Mountain Zonal – The mountain zonal series of vegetation lies along the east slope of the Sierra Nevada and includes various trees, mountain brush, and a variety of forbs and grasses. Depending on the elevation, the trees found in this community can include the Ponderosa pine-white fir community, the red fir community, the lodgepole pine-mountain hemlock community, and the whitebark pine community. The common mountain brush species are manzanita, serviceberry and squaw carpet.

Sierra Tundra – This community is found at the highest elevations and is characterized by low-growing perennial herbs, numerous grasses, sedges and forbs with an abundance of barren rocky land.

Atypical Plant Communities

In addition to the typical plant communities that are found in the County, there are a number of anomalous communities that occur in the southern portion of the County. These distinct and unique communities (“floristic islands”) of Sierran plants occur on altered andesite soil types in an arc that begins in the vicinity of Evans, Alum and Hunter Creeks in southwest Reno and loops northward to Peavine Mountain and then east and south through the Pah Rah and Virginia Ranges. In addition to disjunct stands of Sierran trees and other plants, these plant communities include plant species which are found nowhere else. This combination makes them valuable not only for the protection and perpetuation of rare species, but also important for scientific study.

Regional Ecological Significance

Several conditions present within Washoe County contribute to the result that there is a higher diversity of plant species in the County than in any county adjacent to it in Nevada, Oregon or California. At its southern end, the County encompasses the east-west transition from the Sierra Nevada to the Great Basin, while to the north it includes the transition from the Great Basin to the high lava plains of the Columbia Plateau. The flora within the County includes elements of the three distinctive floristic provinces.

It should be recognized that the vegetation of 100 years ago may differ considerably from that found today, especially in the southern portion of the County. Heavy grazing, farming, periodic wildfires, invasion of inadvertently introduced plants, accelerated erosion, development in forest lands, and other factors have caused these changes. Continuation of these actions may lead to major adverse impacts on watersheds, forests and woodlands, wildlife habitats, and may create greater fire hazards. These actions can also further endanger rare plant species in Washoe County.

Vegetation protects watersheds by holding water in the soil, preventing rapid runoff, and retarding erosion. Rapid runoff and erosion lead to greater pollutant loadings resulting in degradation of both the surface water and groundwater resources of the watershed. Forests and woodlands benefit mankind and the natural environment by providing recreational areas. These areas may also act as buffers against noise, serve as an agent in air purification, and have an economic value as both a scenic resource and a source of raw materials. As the vegetation of an area is changed, the wildlife that can be supported is usually changed as well. Finally, the introduction of invasive weeds such as cheatgrass can greatly increase the fire hazard and alter habitat. The effects of development on vegetation can be closely monitored and mitigation measures can be utilized when adverse effects are expected.

Threatened and Endangered Species

Based on a list compiled by the Nevada Natural Heritage Program, five plant species in Washoe County are identified for Nevada state protection. Four of these species are listed by the State of Nevada as critically endangered, one is federally listed as endangered, and two are candidates to be added to the federal list (See Table One for a list of these species). By avoiding further damage to these species and their habitats, their presence in Washoe County can be maintained.

Wildlife and Wildlife Habitats

A diversity of wildlife species plays an important role in the health of the environment, and the key to maintaining this diversity is to preserve the lands that make up their habitats. The impacts of human development and human activities on wildlife are significant and, for the most part, detrimental. To assess impacts, it is necessary to consider the ecosystem that supports life in an area. The ecosystem is extremely complex, with numerous interrelated organic and inorganic components which are continuously being recycled. An activity that disrupts part of this system can have a secondary effect on the rest of the system. For example, removal of a sagebrush-bitterbrush community will eliminate feed and cover for rabbits, which are in turn food for the bobcat and for hawks and eagles. Hence, it is important to protect the habitats for all wildlife species in the region.

Several facilities in Washoe County have been created to preserve wildlife populations: Anaho Island in Pyramid Lake, set aside in 1913 as a preserve for white pelicans and other waterfowl; the Sheldon National Wildlife Refuge in northern Washoe County, created for the protection of the pronghorn antelope; and Scripps Wildlife Management Area in Washoe Valley, established as a major waterfowl breeding area. However, each of the region's wildlife species are still facing problems related to destruction or degradation of their habitats from causes such as development and recreational impacts.

Big Game Species

Big game species occurring in Washoe County include mule deer, California bighorn sheep, pronghorn antelope, and black bear.

One of the largest migratory herds of mule deer is the Lassen-Washoe herd. The herd winters primarily in Lassen County, California, and Washoe County, Nevada, with major summer ranges in Plumas, Sierra, Nevada, and Placer Counties in California. With construction of deer-proof fencing, under-crossing structures, and one-way gates on deer migratory routes across U.S. Highway 395 north and south of Hallelujah Junction, highway deer mortality in these areas has been reduced to near zero. However, deer ranges are generally in poor condition – plant cover has been reduced, variety has decreased, and reproduction is limited or absent. These conditions are primarily a result of overgrazing, competition with livestock, and fire. The Bighorn Sheep Habitat map and the Mule Deer Habitat map depict the habitat for these species in Washoe County.

The California bighorn sheep has been listed as a protected species under the California Endangered Species Act since 1972. In 1999, the U.S. Fish and Wildlife Service began the process for federally listing the population segment of the central and southern Sierra Nevada (not including Washoe County bighorn sheep). The final rule granting endangered status to that population segment was published in January 2000.

While bighorn sheep numbers for this region were very low in the 1990s, there are currently several areas within Washoe County where their numbers are increasing. According to Nevada Department of Wildlife survey information, populations in the Calico Mountains, High Rock Canyon, Hays Canyon Range, and the Granite Range are doing well. The small population in the Virginia Mountains, however, has been “stable to slightly declining” and potential development of private and public lands in this area have the potential to further threaten this population.

Although very few bighorn sheep presently inhabit the region, there are many areas that are potentially suitable as bighorn sheep habitat. At this time, the only place bighorn sheep have been successfully reintroduced in Washoe County is the Granite Range. Other locations are being considered but the probability of successful reestablishment is small because of livestock competition, disease, poaching, overhunting, and increased public use of bighorn habitat areas. Bighorn sheep depend heavily on grass, taking few forbs and little browse. They thrive when more grass is available than presently exists. Therefore, there must be considerable vegetation improvement for the sheep to do well.

Pronghorn antelope observations were frequently recorded in the journals of travelers in the mid-1800s but, by the early 1900s, it was feared the antelope would become extinct in California and Nevada. Populations have since recovered and are now gradually increasing. Currently, three major factors are adversely affecting antelope – a lack of forbs in early spring and summer, competition for bitterbrush with livestock and deer, and predation on newborn fawns. The Pronghorn Antelope Habitat map and the Black Bear Habitat show the habitat for these species within Washoe County.

The black bear is considered rare in Nevada. The only habitat in which it is found in the state is in the Carson Range of the Sierra Nevada.

Game Birds

Sage grouse inhabit most sections of the County. The important sage grouse habitat components are strutting grounds, nesting areas, brooding areas, and wintering areas. The loss of any one or more components results in the reduction of grouse population. Sage grouse numbers had been on the decline in the last two decades, prompting a petition to be submitted to the U.S. Fish and Wildlife Service (USFWS) for federal listing of the species. The USFWS determined that more information was needed in order to list the species as threatened or endangered. Recognizing the opportunity to stave off the federal restrictions that would come with an Endangered Species Act listing of the sage grouse, a number of groups came together to work on strategies to enhance and protect sage grouse populations so that listing would not be necessary. In 2000, Governor Guinn directed the creation of a Sage Grouse Conservation Team, tasked with preparing a conservation plan that would conserve and protect the sage grouse and their habitat.

This conservation plan was adopted in 2004 and sage grouse conservation efforts have moved into the implementation phases. As reflected in population counts in the last five years, the overall population of sage grouse in Nevada is increasing. Sage grouse in Washoe County occur in five different Population Management Units (PMUs), two of which cross state boundaries into California. The sage grouse numbers in these PMUs are stable to increasing. Efforts are underway to improve habitat on public lands in these areas, as well as to work with private landowners to promote conservation easements on significant sage grouse habitat. (See the Sage Grouse habitat map.)

The chukar partridge was first introduced into the state in 1935 and, since that time, has become the state's number one upland game bird. Not only is the chukar the most popular, but it is also the most abundant and widely distributed of the state's upland game birds. Chukar habitat is primarily determined by geographic and vegetative components and is generally associated with the northern desert shrub community and, to a lesser extent, with the salt desert shrub and pinyon-juniper woodland communities. Cheatgrass, as well as other perennial and annual grasses and forbs, are the chukar's dietary staples.

Quail are commonly found in open, brushy rangeland, but they are restricted to areas within about 300 yards of water. Riparian areas constitute prime quail habitat. Quail habitat is currently in poor condition throughout most of the County. Livestock compete with quail for food and are attracted to the forage areas near water. Their feeding and rubbing habits destroy young trees and shrubs that would provide quail cover and roosting areas. Elimination or severe reduction of willows and other shrubs near water sources destroys preferred quail habitat.

Mourning doves and certain species of ducks and geese are also found in many areas.

Non-Game Species

Some of the more common small mammals found in Washoe County include shrews, moles, bats, ground squirrels, chipmunks, pocket gophers, pocket mice, kangaroo rats, mice, wood rats and voles. Large mammals include beaver, muskrats, gray and kit foxes, bobcats and mountain lions. Other mammals found in the County include coyotes, raccoons, weasels, badgers, skunks and porcupines.

Varieties of birds are well represented in the region and some of the common nongame species include grebes, herons, bitterns, crows, jays, chickadees, nuthatches, wrens, thrashers, thrushes, woodpeckers, flycatchers and swallows. Numerous species of raptors (i.e. birds of prey) are also present, including the ferruginous hawk, sharp-shinned hawk, goshawk, marsh hawk, red-tailed hawk, golden eagle, prairie falcon, American kestrel, turkey vulture, great-horned owl, long- and short-eared owl, screech owl and burrowing owl. (See the Raptor Habitats map.)

Several areas in the Truckee Meadows and its surroundings are considered to be critical habitat areas. One such area is the Truckee River which provides important riparian habitat for a variety of birds and mammals. Birds that overwinter along the river are dependent upon the adjacent fields for feeding and nesting. Water ouzels, for example, overwinter here, as do a number of other rare species not normally found in this area of Nevada. Another highly visible species is the Canada goose which is found throughout the Truckee Meadows, as well as in many remote parts of the County.

Wild Horses

Several herds of wild horses are scattered throughout the region. In the past, wild horses were gathered and sold for slaughter or private use. This practice was halted with the passage of the Wild and Free Roaming Horse and Burro Act. Horses do not have specific summer and winter ranges other than normal expected movement from higher to lower elevations or to open, windswept ridges during periods of deep snow. In exceptionally severe winters, they migrate to the lower elevations but are reluctant to leave their home range. (See the Wild Horse and Burro Herd Management Areas map.)

Horses prefer to feed on grass or grasslike plants but will eat shrubs during fall and winter. Since both horses and cattle subsist primarily on grasses, there is competition for food. However, actual competition is lessened by horses utilizing higher, steeper, and rockier country and by their feeding farther from water than wild cattle. Competition is greatest around water in meadow areas and stream bottoms. Horses, deer and antelope also have a dietary overlap at certain times of the year. Conflict exists in the spring when all three species utilize browse.

Threatened and Endangered Species

Based on a list compiled by the Nevada Natural Heritage Program, there are two species occurring in Washoe County listed as endangered and two as threatened under the Federal Endangered Species Act of 1973. Additionally there are two species listed as candidates to the federal list and sixteen species on the Nevada state list of protected species (See Table 1 for a list of these species).

The Carson wandering skipper and the cui-ui lakesucker are listed as federally endangered species. The Carson wandering skipper, a small butterfly, was listed as endangered in November 2001. The species inhabits lowland grassland habitats on alkaline substrates at elevations lower than 5,000 feet. There are many threats to the survival of this species, including habitat destruction, degradation and fragmentation from urban and residential development, wetland habitat modification and invasive plant infestation. Road construction, recreation activities and water exportation projects are also threats to this species.

The cui-ui lakesucker is an indigenous sucker found only in Pyramid Lake and the lower Truckee River. The cui-ui primarily inhabits the offshore waters of Pyramid Lake, and congregates at the mouth of the Truckee River during the spring to spawn, but only in years where there is sufficient water flow. The cui-ui was originally listed as endangered in 1967. The threats to the survival of this species are due to a number of historic and current factors lowering the water quantity and water quality reaching the lower Truckee River and Pyramid Lake.

The Lahontan cutthroat trout was originally listed as endangered in 1970 and later reclassified to threatened in 1975 due to successful stocking and management programs. Today one of the greatest challenges to this species is fragmentation of subpopulations, which causes a decrease in migration rates. This can lead to subpopulations dying out, moving the entire population slowly toward extinction. The current strategy for the survival of this species centers on maintaining a networked population in the streams and rivers within its range, and establishing self-sustaining lake populations for long term persistence.

The Warner sucker is endemic to the Warner Basin which encompasses portions of southern Oregon, northern California and northern Nevada. It inhabits the lakes and certain stream reaches of the Warner Valley. The main threat to the species is habitat modification and degradation caused by human activities such as irrigation diversion, watershed degradation, and introduced exotic fish species.

Table 1: Threatened, Endangered and Candidate Fauna and Flora Species in Washoe County

SPECIES	STATUS
Fauna	
American marten	State protected
American white pelican	State protected
California spotted owl	State protected
Carson wandering skipper	Endangered
Cowhead Lake tui chub	Proposed endangered
Cui-ui	Endangered; State protected
Great gray owl	State protected
Harlequin duck	State protected
Lahontan cutthroat trout	Threatened; State protected
Mono Basin mountain beaver	State protected
Mountain plover	State protected
Mountain yellow-legged frog	Candidate
Northern flying squirrel	State protected
Northern goshawk	State protected
Pygmy rabbit	State protected
Sierra Nevada snowshoe hare	State protected
Spotted bat	State protected
Tricolored blackbird	State protected
Warner sucker	Threatened
Warner Valley redband trout	State protected
Yellow-billed cuckoo	Candidate
Flora	
Washoe pine	State protected
Webber ivesia	Candidate; State protected
Williams combleaf	State protected
Steamboat buckwheat	Endangered; State protected
Tahoe yellowcress	Candidate; State protected

Threats to Land Resources

There are a number of factors threatening the land resources discussed above, including the proliferation of invasive weeds and the increased threat of wildland fires.

Noxious Weeds

Invasive plants are a growing problem due to the rapidly increasing number of acres infested every year. Many non-native plants are introduced to the region on an ongoing basis, most of them being benign. Certain species, however, are considered invasive because of their ability to spread and reproduce rapidly. Without their native predators keeping their populations under control, these species can out-compete all other vegetation in an area to form monocultures, dense stands consisting only of the one invasive species.

The double effect of crowding out native, desirable vegetation and decreasing biodiversity by creating monocultures can have a devastating result to the wildlife habitats in the region as well as greatly impacting water quality and natural function of watersheds. In recognition of these environmentally and economically damaging effects, Nevada passed noxious weed legislation, Nevada Revised Statutes, Chapter 555 – Control of Insects, Pests and Noxious Weeds. This law defines the term “noxious weed,” lists those plants considered by the State to be noxious, and requires the landowner or land occupier to control any noxious weed occurring on a property.

In Washoe County, the problem of invasive and noxious weeds is compounded by increasing urbanization. The number of properties being developed, and the associated construction activities, have contributed to the rapid spread of many species locally, including tall white top and musk thistle. However, with the efforts of several groups and agencies, public awareness of this problem is also increasing. Educating the public to the damage noxious weeds can do and how to prevent their spread, is part of a coordinated effort that also includes implementation of development practices that can help contain and prevent infestations.

Fire Hazards

According to the Sierra Front Wildfire Cooperators (SFWC), much of western Nevada is considered a high hazard fire environment. There are several factors that contribute to this:

- Fire is a natural part of the environment in the region.
- Many homes are built and maintained in this fire environment without regard to the wildfire threat.
- The risk of fire starts is increased with more people using wildlands recreationally.
- Wildfires burn more intensely due to changing factors such as shifts in vegetation to more flammable invasive weeds.

The SFWC promotes the use of “pre-fire” activities to enhance the ability to live more safely in this high fire hazard environment, including proper vegetation management around homes and other developments, use of fire resistant building materials, and appropriate subdivision design.

Agricultural Lands

The continued role of agriculture in the County economy will depend, to a large extent, on the degree to which farmlands and rangelands are preserved.

Most of the County's agricultural activities were, at one time, centered in the Truckee Meadows because of the area's accessible location and soil conditions which were among the best in the County. Today, the County's agricultural land uses have shifted away from the urbanized Truckee Meadows area to outlying areas. Mostly due to urban expansion, the overall number of irrigated acres in the Truckee Meadows has been on a decreasing trend, which is expected to continue.

The preservation of land in farm use can contribute to improved environmental quality in the community while also providing productive, taxpaying, privately-maintained open space with the environmental benefits of rural aesthetics and enhanced air and water quality. Farmland preservation can be used as a component of growth management in which development is directed away from the productive farm areas and into developed areas of the County. In addition to managing growth, holding the land in farm use can form a "land bank" for the future that keeps the options on the land from being foreclosed by premature conversion. Thus, the factors that are clearly linked with the retention of farmland use involve environmental, open space, and growth management considerations.

Rangelands

A small portion of the County's rangeland is held by private individuals; most, however, is public land that is officially open for multiple uses. While grazing privileges may be leased to ranchers for cattle grazing, the land is also open to miners, hunters, fishermen, recreationists and others. These rangelands play an important role in livestock production in the County.

Two federal agencies, the U.S. Forest Service and the Bureau of Land Management, administer the County's rangelands. The publicly owned rangelands are grazed under permits or licenses issued to ranchers and livestock growers. The season for grazing for the BLM and associated private lands is generally from April to November, although there is some winter use at lower elevations. Most of the early spring and late fall use is by sheep.

On the Pyramid Lake Indian Reservation, the Tribal Council controls livestock grazing. Rangelands on the reservation are used almost exclusively by the tribe, mostly for cattle and horses.

Range forage production (quality of the rangeland) varies from high to low, with a large percentage of the County being in the lower forage production class. There are few, if any, pristine range areas. Most of the rangelands have been heavily used by sheep, cattle and horses for more than 100 years. As a result of heavy use in the past, numerous problems exist on today's rangelands. These problems include poor management which has led to low forage yields and the growth of undesirable plants, degradation of plant cover which has contributed to soil erosion and loss of fragile topsoils, and introduction of invasive plant species which has altered range plant communities and replaced desirable species with those less desirable. These problems can be overcome and rangelands can be restored and protected to ensure their continued use for agricultural as well as aesthetic and environmental uses.

In light of continued urbanization and its subsequent effect on the loss of agricultural lands, Congress established a federal policy on the importance of protecting these lands--the Farmland Protection Policy of the Agriculture Department's reauthorization bill, the Agriculture and Food Act of 1981. The Farmland Protection Policy states that in all federal programs, consideration must be given to protecting three categories of farmland, unless an overriding national security problem dictates otherwise. These categories include "prime farmland," the highest quality cropland; "unique farmland" which is capable of yielding certain high value crops such as citrus fruits; and farmland designated as important by state and local government, with the consent of the Secretary of Agriculture.

Water Resources

Water resources represent environmental and physical constraints to development as well as a necessary resource for continued growth and development and healthy, productive wildlife habitats. As the designated regional service provider, Washoe County is responsible for water resource management issues which transcend jurisdictional boundaries. The water resource issues discussed in this section include the broader issue of water resource planning as well as the specific topics of storm water quality, flood hazards, wetlands and fisheries. The Public Service and Facilities Element discusses additional water resource issues: water supply, wastewater and runoff management.

Water Resource Planning

Attempts at regional water planning started in 1983 when the Nevada State Legislature established the Regional Water Planning and Advisory Board (RWPAB) of Washoe County. The enabling legislation's general mandate to the RWPAB was to develop a regional plan for present and future uses of water resources in the region, recognizing local governments' land use plans and coordinating the needs of incorporated areas with unincorporated areas. The RWPAB was also directed to identify "potential supplies of water" for the region. The Regional Water Resources Plan (RWRP) was accepted by the RWPAB in March 1994 as a starting point for further planning efforts.

In 1988, the Legislature passed NRS 278.026–029 inclusive (amended in 1991), mandating the development of a comprehensive land use plan for the region. The Truckee Meadows Regional Planning Governing Board (established by this legislation) could not agree as to the best method of providing wastewater and water services for the region but did agree to abide by the findings of an impartial fact finder to establish a coordinated approach to deal with these issues. The fact finder, Kato & Warren Inc., completed its report in 1990. The report recommended that a unified and coordinated approach, directed by one agency, be used to develop a plan to address wastewater treatment, water supply, flood control and storm drainage, and Truckee River water quality. The fact finder further recommended that Washoe County serve as the overall agency to develop this plan. Specifically, the report recommended that:

"The County should begin at once to organize and conduct a coordinated study of water supply, waste treatment, and water quality aspects of flood control and drainage such that water quality standards in the Truckee River can be achieved to the satisfaction of the Pyramid Lake Paiute Tribe and the state and federal agencies."

From this recommendation, Washoe County funded the Regional Water Supply and Quality Study (RWSQS), which was completed in 1993. This extensive report was accepted by the Washoe County Board of County Commissioners but not adopted. In 1995, Washoe County and the Cities of Reno and Sparks developed legislation to again address regional water issues. This legislation, NRS 540A, was approved by the Nevada State Legislature in July 1995 and amended in 1997 to remove a sunset date. These statutes provide the basis and direction for the Northern Nevada Water Planning Commission and the Comprehensive Regional Water Management Plan (Regional Water Plan). This statute provides that the Washoe County Board of Commissioners is the Board to oversee and approve the plans developed by the Northern Nevada Water Planning Commission and it further provides that Washoe County is responsible for wastewater planning and the remediation of groundwater contamination in the region.

The Water Planning Commission approved and recommended the 1995 – 2015 Washoe County Comprehensive Regional Water Management Plan to the Board of County Commissioners on November 20, 1996. The Board of County Commissioners adopted the Plan with amendments on January 28, 1997. As a result of a legislatively mandated review, this Plan was update with the preparation of the 2004 – 2025 Washoe County Comprehensive Regional Water Management Plan. The updated Plan addresses all of the water resource and conservation issues mandated under the NRS 278.160 requirements for a Conservation Plan. The Board of County Commissioners adopted the latest version of the 2004 – 2025 Washoe County Comprehensive Regional Water Management Plan in January 2005.

Storm Water Quality

Development design and construction practices used in the past have resulted in some negative impacts, including pollution of water resources by contaminated storm water runoff. Conventional storm drain systems and construction practices commonly used during the past 50 years have resulted in increased volumes of runoff into storm drain systems and more pollution of water resources. These practices have altered the natural hydrologic functions of development sites by decreasing the amount of undisturbed soil and vegetation that helps absorb, filter and deflect water flows. As the total amount of impervious cover increases on a site, not only does the volume of flows generated by the site increase, but also the quantity of pollutants picked up by the water as it flows across lawns, driveways, streets and parking areas into the storm drain system. This affects the region in many ways, from necessitating more expensive water treatment systems to degrading wildlife habitat to creating public health vector insects.

To decrease this impact, an alternate approach to site development and storm water management termed “Low Impact Development” (LID) has been developed. LID methodologies are intended to more closely mimic the natural hydrologic functions of areas so that they can continue to be effective in managing storm water after they are developed. Common LID practices include minimizing land disturbance, disconnection of impervious surfaces, and on-site bioretention areas and vegetated swales where infiltration and pollutant uptake can occur.

As the nation has become more aware of the problem of storm water pollution, regulations have been implemented to help reverse the problem and better protect water quality. The Nevada Division of Environmental Protection has issued a National Pollution Discharge Elimination System (NPDES) Permits to Reno, Sparks and Washoe County. The permit requires the entities to control pollutants in storm water discharges

to the Maximum Extent Practicable (MEP) and to reduce pollutants to a level compatible with the beneficial uses designated for receiving waters such as the Truckee River.

These Permits also require implementation of a Regional Storm Water Quality Management Program (RSWQMP). The RSWQMP for this region was adopted in 2001, and its implementation is ongoing. The Land Use Planning element of this program calls for the development of planning policies and procedures that will effectively require the implementation and long-term maintenance of structural controls and LID practices for storm water quality improvement in new development and redevelopment projects. Each entity is responsible for their own ordinances, plan review, inspection and maintenance of structural controls and LID practices within their jurisdiction.

A series of guidance documents is being developed as part of the RSWQMP, as listed below:

- Truckee Meadows Construction Site Best Management Practices Handbook (2003)
- Truckee Meadows Structural Controls Design Manual (2004)
- Truckee Meadows Low Impact Development Handbook (2006)
- Industrial BMP Handbook – being developed
- Watershed Protection Manual – being developed

These documents will assist designers, engineers and agency staff with the selection, siting and operation of post-construction structural controls, as well as the best construction practices for implementation. These guidance documents, in coordination with the ordinances and processes enacted by each local jurisdiction, will help the region protect and improve storm water quality and thus the health of the local water systems.

Flood Hazards

Floods are natural and recurrent events. They become a problem when man competes with rivers, streams and lakes for the use of the floodplain – the high water channels of rivers, streams and lakes. Flood hazards can be grouped into two broad categories: seasonal flood hazards and cloudburst flood hazards.

Most seasonal floods occur in the late fall and early winter months. The typical weather pattern that produces these floods is a storm or rapid succession of storms accompanied by unseasonably high temperatures and rain that melts most of the existing snowpack.

Seasonal and cloudburst or flash floods have occurred in Washoe County (particularly in the Cities of Reno and Sparks), in both historic and modern times. In late fall and early winter, rapid snowmelt accompanied by unseasonably warm rains has resulted in seasonal flooding of the Truckee River and its tributary streams (e.g. Evans Creek, Thomas Creek), causing damage in Washoe County and in Reno and Sparks. In addition to regional flooding, there are numerous small drainages where flash flooding could occur from localized thunderstorms. Playas or intermittent dry lakes have also been subject to seasonal flooding. During winter months, the playas flood and become sites of ephemeral lakes. Several playas exist in Washoe County and are shown on the Washoe County Mineral Resources and Major Playas map.

In many areas of Washoe County, flooding is a recurring problem. Flooding may occur during periods of rapid snowmelt caused by winter rainstorms, heavy spring runoff, and

summer convection rainstorms. The more populated areas of the County, mainly the Truckee Meadows and the valleys to the south, have a long history of flooding.

Floods on the Truckee River generally result from heavy rainfall during the winter months. Summer convection storms can create severe localized flooding on tributary streams. All floodplain areas of the Southwest Truckee Meadows, Washoe Valley, and Pleasant Valley have suffered damage from large floods in the past. A severe flood hazard also exists in the Hualapai agricultural area north of Gerlach.

To prevent severe flooding in the Truckee Meadows and also provide for water storage, reservoirs have been constructed on the Truckee River tributaries to store floodwater. The Truckee River channel through Reno has been deepened and cleared of obstacles. These measures were designed to reduce or eliminate flood damage; but, due to increasing development in the floodplain areas of the Truckee Meadows, future flooding may inflict greater physical and monetary damage than before. Flooding, together with the associated control and management of runoff, is discussed further in the runoff management section of the Public Services and Facilities Element.

Encroachment of structures into floodplains is a serious problem because it interferes with the natural flow during high stages. When this occurs, flood peaks are increased downstream with accompanying increases in hazards. Development in the floodplain can also result in the loss of open space and agricultural land. The Federal Emergency Management Agency (FEMA) has mapped the County's 100-year floodplains. The FEMA maps were utilized in showing areas least suitable for development. These areas are shown on the Development Suitability map contained in each area plan (see Volume Two of the Master Plan).

Floodplains are valuable areas demanding protection since they have a water storage function which affects downstream flow, water quality and quantity, and suitability of the land for human activities. They offer opportunities for open space, recreation and agricultural activity. Because the floodplain is a valuable resource, the nature and extent of floodplain use should be compatible with risk involved and the degree of protection that can be provided.

Wetlands

Generally, wetlands are land-water interface areas where the water table is at, near or above the land surface. They include salt marshes, freshwater marshes, swamps, bogs, wet meadows and potholes. They may also be permanently wet or intermittently covered by water.

Freshwater marsh and wet meadow are the most significant types of wetlands found in the County. In some instances, valley areas contain scattered small potholes and an occasional salt marsh. Wetlands and potential wetlands are scattered throughout the County. In the southern portion, they include the Washoe Lake area in Washoe Valley, southern Spanish Springs Valley, portions of the Southeast Truckee Meadows, and the Truckee River Delta at Pyramid Lake. In central and northern Washoe County, these areas include Massacre Lake northeast of Vya, Mosquito Lake in the extreme northeastern sector, and areas south of Hualapai Valley.

Wetlands are a valuable natural asset to Washoe County. They can provide natural flood control such as in the Southeast Truckee Meadows, a habitat for fish and wildlife resources, and serve as sediment traps and pollution filtration systems. Wetlands also offer visual relief from large expanses of dry and barren land and provide recreational

sites. However, urban and agricultural demands for land and water can easily disrupt these fragile areas.

Wetlands have been filled or drained to create land for agricultural, commercial, industrial, residential or other uses. When development encroaches on wetlands, their ability to retain water and maintain an ecological balance is reduced. Polluted storm runoff, siltation, fertilizers and other products damage wetlands. Once filled or degraded, wetlands can no longer provide needed flood protection or a habitat for fish and wildlife. To ensure against their loss, it is necessary to prevent piecemeal alteration and destruction of wetland areas.

Fisheries

Fishing in Washoe County has long been a source of recreation and a means to supplement food supplies. In the early days of the County, commercial fisheries were developed in several areas and provided cutthroat, cui-ui, whitefish and other species to local residents.

At the present time, there are 26 game fish species established in Nevada. Of the cold water types, rainbow and brook trout predominate. In Washoe County, Pyramid Lake produces the Lahontan cutthroat trout and the prehistoric cui-ui, a non-game fish. Rainbow, mackinaw and brown trout, along with whitefish and Kokanee salmon, are found in Lake Tahoe. Many of the perennial tributaries to the Truckee River, the Truckee Meadows, and Washoe Valley provide habitat for trout and other species. The Truckee River game species include brown trout, rainbow trout and mountain whitefish. Catnip Reservoir in the northern portion of the County and Marlette Lake above Lake Tahoe provide a protected environment for the rearing of cutthroat trout. Isolated reservoirs throughout the County also produce game fish. Warm water species of game fish found in the County include the Sacramento perch in Pyramid Lake and channel catfish in Washoe Lake and the Truckee River.

Truckee River Fishery

Before the Truckee River was intensively developed for water diversion, it provided habitat for at least eight native species of fish, all of which had free access to the river from Pyramid Lake to Lake Tahoe. Water diversion, water quality degradation, and the introduction of exotic species have combined to extirpate the original strain of Lahontan cutthroat trout and to endanger the cui-ui. The foremost problems for these species have been the diminished flow in the river downstream of Derby Dam and the lowering of Pyramid Lake which blocks the natural passage of fish between the river and the lake. The Marble Bluff dam and fishway was constructed in 1975 to partially mitigate the blockage problem.

Fish in the Truckee River system from Verdi to Pyramid Lake consist of both native and introduced game and non-game species. The principal game fish found in the system include brown trout, Lahontan cutthroat trout, rainbow trout, mountain whitefish, largemouth bass, black crappie and channel catfish. The Lahontan cutthroat and mountain whitefish are the only native game fish. Native non-game species include the cui-ui, tui chub, Lahontan redbreast, speckled dace, Tahoe sucker, Lahontan mountain sucker, and Paiute sculpin. The endangered cui-ui spawns in the lower end of the river during years of high discharge to Pyramid Lake.

Major threats to the trout of the Truckee River are chemical pollution and elevated temperatures. Chemical pollution of the river results from rain runoff from hard-surfaced streets and paved areas which collect gasoline, oil and other polluting substances for transfer to the river. Some species of trout, such as the brown trout, are more resistant to the effects of chemical pollution than are others; the Lahontan cutthroat is among the least resistant. The distribution of trout in the Truckee River has changed, with the percentage of brown trout steadily increasing over the past several years. This species of trout, although not native, is now present in the greatest numbers and has become self-propagating.

Nutrients are added to the river as a result of siltation from runoff from construction projects in developed areas and from sewage effluents. The effects of these pollutants on fish life are most noticeable downstream from the outfall of the Reno-Sparks Wastewater Treatment Facility. Below this point, the river is relatively devoid of cold-water fish; warm-water species predominate. Channel straightening, streambank denuding, and stream flow regulation have all contributed to stream temperatures that are marginal for cold water fisheries. Falling water levels at Pyramid Lake are leading to salt buildups which can also threaten some fish populations.

Through careful management and stocking programs, an adequate fishery has been established. However, loss of habitat due to pollution, erosion, temperature elevation and construction of dams will continue to be a threat to the Truckee River system and to the entire region's fisheries.

Air Resources

Air quality is an important issue in Washoe County. The Truckee Meadows' land use pattern, landforms, and atmospheric conditions all contribute to make air pollution a potentially serious health and environmental concern. The areas of highest residential density are situated in a valley that tends to trap airborne pollutants and limit their dispersion into the atmosphere. During the winter months, this situation is aggravated by temperature inversions in which heavy, cold air settles on the valley floor and a layer of warm air acts as a lid, trapping locally generated, and in some cases transported, emissions resulting in elevated pollution levels. Further, unless support for the continuing strategies and additional measures are taken to limit or reduce the emissions which contribute to the formation of elevated pollution levels, the county's outdoor image and large tourist industry will be negatively affected. The overall impact of poor air quality is an unhealthy environment for the residents and diminished economic development possibilities.

This Conservation Element provides a number of goals and policies to be implemented to reduce air pollutants in Washoe County. The requirements of the federal Clean Air Act are the basis for these goals and policies, as well as the resulting state and local strategies developed through public forums. These policies are designed to meet and maintain compliance with federal and state air quality standards by the appropriate dates, given the projected growth outlined in the Master Plan Population Element.

Air Quality Standards

The Truckee Meadows Hydrographic Basin is currently designated as non-attainment, or in non-compliance, with the National Ambient Air Quality Standards (NAAQS) for PM10 (particulate matter less than 10 microns in diameter).

However, significant improvements in air quality have been realized throughout Washoe County. The trend of decreasing pollutant levels has resulted in measured ambient concentrations that are complying with the federal health based standards. The most recent PM10 NAAQS exceedance occurred in January 2005.

Air Quality Goals

The air quality goal for Washoe County is to attain and maintain the NAAQS for all pollutants. To achieve this goal, appropriate emission levels need to be reduced and maintained, despite continued projected growth, at a level that will allow Washoe County to continually attain the NAAQS.

The Washoe County District Health Department (WCDHD) has recently prepared a redesignation request submittal for PM10 that will be submitted in 2009. A condition of approval for this redesignation request is a maintenance plan that identifies strategies to ensure pollution levels will remain at or below the NAAQS. A carbon monoxide (CO) redesignation request and maintenance plan was submitted to the Environmental Protection Agency (EPA) in September 2005, which fully approved this submittal in 2008. Redesignation attainment/maintenance became effective on August 4, 2008.

An important element to the air quality goals is the ambient air quality monitoring of pollutant levels in both the urban and outlying rural air basins. The WCDHD operates and maintains an extensive monitoring network that allows the tracking of air quality trends throughout Washoe County.

Air Quality Strategy

The Air Resources section of the Conservation Element outlines a strategy, though a series of policies and action programs, which will maintain CO levels and reduce PM10 to a level in conformance with the NAAQS. Carbon monoxide and ozone precursor emissions from mobile sources will continue to be reduced through an annual inspection and maintenance program for automobiles and light-duty trucks, increased use of the Citifare bus system, oxygenated motor vehicle fuels, and road system improvements. The WCDHD residential wood combustion program, new combustion technologies, and operating permit requirements will reduce stationary source CO emissions. The reductions in PM10 emissions will be achieved through construction dust control, street dust control, paving programs, and wood burning reductions. Although there will be continued growth in Washoe County, the concerted efforts of the general public, along with state and local government, in implementing the policies and action programs contained in the Air Resources section, will help ensure that the County's valuable air resources are protected.

Conclusion

The Conservation Element of the Master Plan outlines policies and action programs for protection and utilization of the County's cultural and scenic, land, water, air and related resources. Cultural and scenic resources will be protected through preservation and restoration of archaeological, architectural, historic and scenic places. Through recognition of the constraints related to soils, topography, vegetation, geologic hazards, geothermal sites, minerals, wildlife habitats and agricultural lands, land resources can be protected and utilized as development occurs. Finally, through intergovernmental coordination, it will be possible to protect the County's residents from flood hazards and protect wetlands, fisheries and air resources.

The Conservation Element provides guidelines for protecting the County's important resources while satisfying the requirement for a conservation plan as outlined by the Nevada Revised Statutes. It is the premise of this Element that environmental factors must weigh far more heavily than they have in the past in planning and development decisions, and that, in the long run, planning in recognition of the environment will be beneficial to the County's inhabitants and, at the same time, provide for the growth and development envisioned for the next 20 years.

Appendix A - Maps Contents

	Page
Bighorn Sheep Habitat	A-3
Black Bear Habitat/Range	A-5
Development Constraints/Suitability	A-7
Geologic Hazards	A-9
Mineral and Geothermal Resources	A-11
Mule Deer Habitat	A-13
Pronghorn Antelope Habitat	A-15
Raptor Habitat	A-17
Sage Grouse Habitat	A-19
Topographic and Scenic Features	A-21
Vegetative Communities/Landcover	A-23
Wild Horse and Burro Herd Management Area	A-25

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