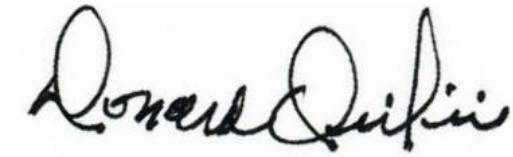
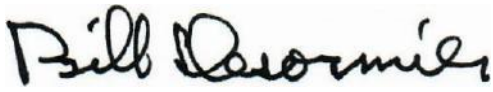
Carson River Master Plan

Prepared by

Carson River Advisory Committee

1996





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Acknowledgments

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Nevada Division of State Parks

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Nevada Division of Wildlife Pat Sollberger/Rob Buonamici/Larry Neel

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Preface

This master plan is intended to be a starting point and a document that guides the implementation of policy and development of improvement projects for the Carson River area. It is intended to be the vehicle that allows the community to move forward politically in order to address river related issues in the broadest sense.

Detailed studies and cost estimates need to be developed. The city and community must move forward jointly. It has been recommended in this document that a Coordinated Resource Management Plan (CRMP) be developed. Within the CRMP, detailed studies and cost estimates can be determined. It can describe the who, what, when, why and how of implementation. The city should begin implementation of this plan by initiating this step as soon as possible.

The initial primary focus of the Committee was to put together this general Master Plan document, with a very concerted effort to involve the community, to help set the foundation for any future development along the river. After having the plan adopted by the Board of Supervisors, the Committee will set priorities for implementation of the other details of the plan. Again, a concerted effort will be made to involve the community, the Park and Recreation Commission, Planning Commission, and other parties, to insure a good working program of implementation.

Chapter One

Carson River Advisory Committee

The Beginning

In 1993, a "Carson River Corridor" was proposed by a member of the Carson City Board of Supervisors. This proposal was introduced following more than a year's effort by the supervisor and a 13 member steering committee on a project which researched land status along the river and explored the feasibility of creating more public land or acquiring easements which would guarantee public access. This committee envisioned creation of a "Carson River Corridor" that would provide public access along a large share of the approximately sixteen miles of river that flows through Carson City.

A few months prior to taking the proposed project public, the supervisor wrote letters to various property owners along the river, notifying them for the first time of the proposed planning and creation of a public open space preserve along the "Carson River Corridor." This letter also served as an invitation to an informational meeting on the "Carson River Corridor" concept. A majority of the citizens present at this meeting in October of 1993, many of them private property owners along and around the river region, became seriously concerned over what they perceived as a personal attack on private property rights and a threat to the peaceful environment of the river area. As a means of addressing the issues and concerns of the citizens present, as well as to offer an opportunity for all of the citizens of the community to become involved with the proposed project, a public workshop was scheduled.

The Carson River Workshop

The public workshop, arranged by the supervisor and the steering committee, took place on February 9, 1994 and was attended by more than one hundred citizens. The purpose of the workshop was to identify and address existing problems along the Carson River and to plan for the protection of the qualities that are valued by the people of the region and the entire community. Issues and values were documented as those in attendance worked through facilitators in an attempt to organize and direct their concerns.

Workshop participants expressed a strong consensus for respecting private property, and for keeping the river as it are. There was also great interest in minimizing impacts along the river and in protecting the integrity of the river environment. The views expressed at the Carson River workshop are listed more fully in Appendix 4.

The Resolution and Committee Members

In an effort to address and support the concerns of the private property owners along the river, and at the same time recognize the Carson River as an outstanding natural, cultural and wildlife resource and outdoor recreational opportunity for the citizens of Carson City, the Carson City

Board of Supervisors adopted A Resolution of Support of Planning for the Future of the Carson River on April 7, 1994 (Appendix I).

This Resolution supported the creation of a Citizen's Task Force to develop and recommend a course of action for the future of the Carson River public lands within Carson City.

The Board of Supervisors accepted applications from all interested members of the community and, after competitive interviews, a nine member committee—The Carson River Advisory Committee—was established. The nine members appointed by the Board of Supervisors represent the following special areas of interest:

- wildlife
- environmental planning
- West River properties
- Historic/cultural/V&T RR/Native American
- properties of 20+ acres
- Mexican Dam properties
- citizen at large
- recreation
- Pinion Hills properties

Supervisor Kay Bennett acts as liaison between the Carson River Advisory Committee and the Board of Supervisors.

Sub Element of Carson City Master Plan

The Advisory Committee reports directly to the Board of Supervisors, but efforts have been made on a continuous basis to coordinate efforts and goals with appropriate commissions and agencies throughout the creation of this plan. The Parks and Recreation Commission, for example, will be advised of any recreational element of the Plan and the recreational element will be reviewed by the Park Commission before it is submitted to the Carson City Board of Supervisors. Similar coordinated efforts will take place with Community Development, Carson City Sheriff's Department, Bureau of Land Management, and so forth. Private land issues will be an integral part of this plan and all efforts will be made to respect private lands and private property rights.

This sub element of the Carson City Master Plan Update is prepared in accordance with the purpose and goals of the Carson City Master Plan Land Use Element Update. It is a key sub element in that it will be tied in to the overall Plan for the future of Carson City. This Carson River Master Plan is designed to provide guidance to those making decisions which will shape the future of the Carson River and the Carson River region. Periodic reviews will help assure that the goals and objectives offered herein continue to be met, yet allow for expansion and revision in the event of change.

Committee Mission Statement

The Carson River Advisory Committee will provide the Carson City Board of Supervisors with informed recommendations on matters concerning the Carson River, the Carson City Master Plan update as it pertains to the Carson River region, and will participate in the plan's implementation.

Committee Goals

1. Establish recreational goals (Recreational Plan)
2. Develop a plan for the safety and security for the public, wildlife, and natural resources on public and private lands
3. Develop a natural resource plan
4. Develop private land policies
5. Develop program for enhancement/protection/preservation of wildlife habitat
6. Develop a plan to protect/enhance/preserve/restore cultural resources
7. Review and recommend city, state, or federal ordinances, laws, or regulations
8. Establish system for plan review for development
9. Develop a program/plan for interpretation/environmental education of natural history/cultural history
10. Promote ourselves as the Carson River Advisory Committee
11. Develop working relationships with all other agencies/groups in relation to the river (public or private)
12. Develop funding sources for implementing the Committee's recommendations

Chapter 2

Physical Description of the River

Physical Description of the River

The Carson River is a major hydrographic feature within western Nevada. Two forks of the river originate in the Sierra Nevada, south of Lake Tahoe, then join near Minden. Extending over 125 miles, the river flows north through Douglas County and Carson City, then turns east as it flows through Lyon County into the Lahontan Reservoir in Churchill County (Figure 1). Prior to construction of the Lahontan Dam, the river drained into the Carson Sink (Moore 1969:3).

With tributaries in the high Sierra, the Carson River originates in alpine and sub alpine vegetation zones, flowing through high mountain meadows and forested canyons into sage covered valleys below. The upper watershed is divided into east and west forks. The west fork begins as several small tributaries, one fed by scenic Red Lake just below Carson Pass, that come together near California Highway 88. The west fork parallels the highway through Hope Valley and flows by the small town of Woodfords, California before entering Diamond Valley near the Nevada state line. Originating further south, the east fork begins near Sonora Pass on Highway 108 and flows through the Carson Iceberg Wilderness Area before paralleling Highway 4 near its intersection with Highway 89. The east fork veers eastward from the highway at Markleeville and crosses into Nevada just above its confluence with Bryant Creek.

Intensive use of the river for irrigation in Carson Valley, and to a lesser extent in Carson City, has produced irrigated pasture and grass meadows on floodplains previously dominated by sage, greasewood and wetland vegetation. Willow thickets, cottonwood groves and pinon covered slopes occur sporadically along the middle reaches of the river. East of Dayton, vegetation changes to low sage and shadscale communities, while eolian dunes in the vicinity of the Carson Plains and Lahontan Dam mark the prehistoric Carson River/Lake Lahontan delta (Mifflin and Wheat 1979: Plate 1). Between 24,000 and 16,000 years ago, prehistoric Lake Lahontan stood at an elevation of approximately 4190 feet above sea level, and reached its maximum high stand at 4380 feet around 12,000 years ago.

As it travels through Carson City, the river flows for a distance of 15.6 miles, skirting the southern edge of Eagle Valley, then turning sharply northeastward (Figure 2). The river meanders through Nevada State Medium Security Prison property just east of Stewart, before entering a narrow gap between the south end of Prison Hill and the Pine Nut Mountains. Flowing north along the toe of the Pine Nut Mountains, the river turns abruptly eastward near Empire, winding through the Carson River Canyon to the Lyon County Line.

The river loses 170 feet as it traverses Carson City, dropping from an elevation of 4631 feet at the Douglas County line to approximately 4460 feet where it enters Lyon County. One hundred and twenty feet of that drop occurs along a five mile section of river in the Carson River Cadyon. Clear Creek, Brunswick Canyon and Carson Creek are major tributaries within the Carson City river corridor.

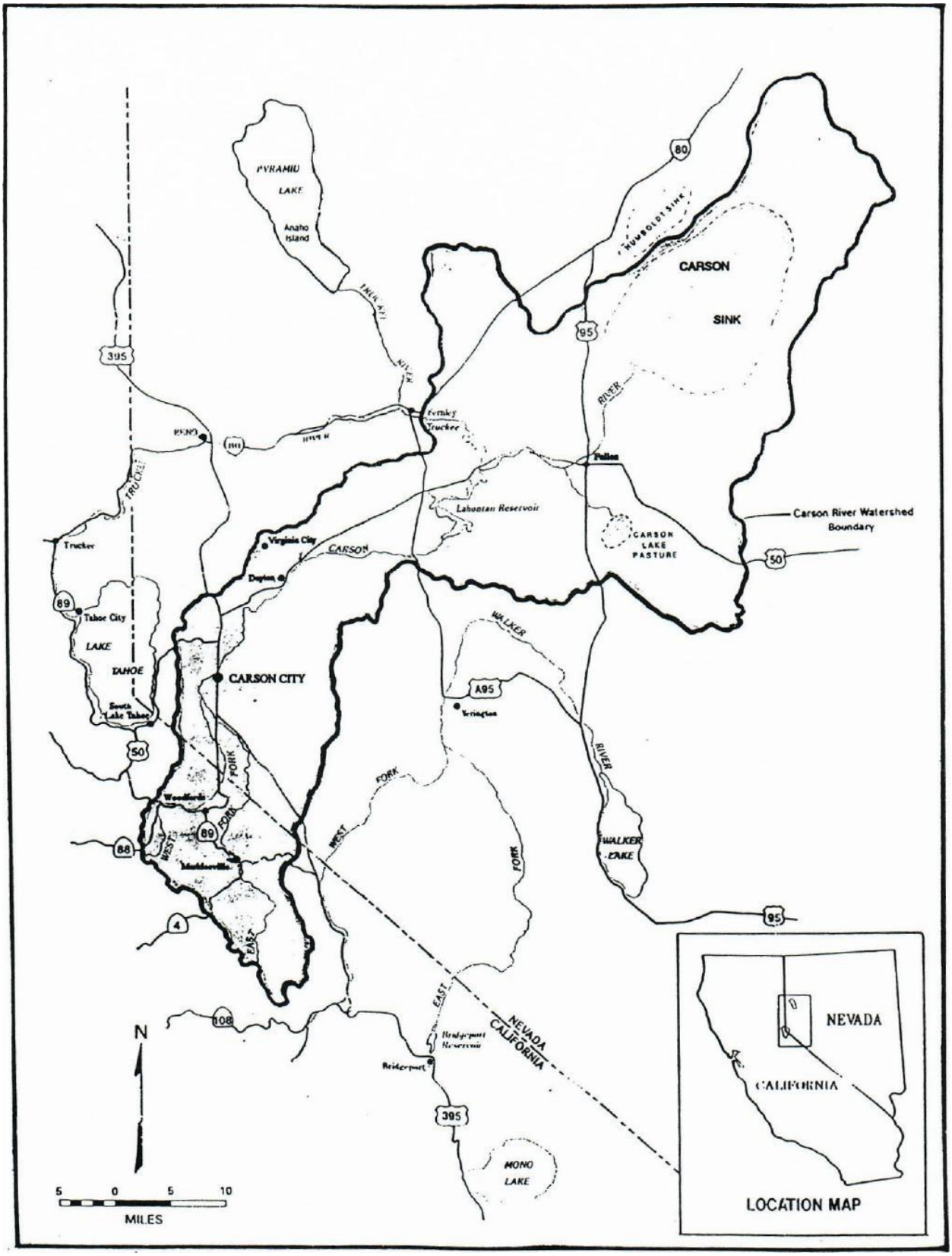

Figure 1- Carson River Watershed

Soils within the area are predominately Quaternary alluvium and floodplain deposits derived from the surrounding granitic, metavolcanic and metasedimentary slopes of Prison Hill and the Pine Nut Range (Moore 1969).

The Soil Conservation Service (Candland 1979), completed a soil survey of Carson City and identified four major soils adjacent to the river. Major soils correspond to slope gradients which range from moderately steep hillside to nearly level floodplain. Agricultural lands along the river are classified within the Surprise Haybourne Prey and Jubilee Bishop soil types and consist of Cradlebaugh loam, Histic Haplaquolls, Jubilee coarse sandy loam and Sagouspe sandy soils. Floodplain soils support native vegetation beneficial to wetland and rangeland wildlife. When irrigated they provide adequate pasture and meadow hay production. Due to the high water table and flood hazard they are generally unsuitable for community development and septic sanitation systems.

Soils on steeper slopes consist of Greenbrae gravelly sandy loam, Haybourne sandy loam and gravelly sandy loam, Holbrook variant and Prey fine sandy loam, gravelly substrate. They currently support limited urban development, limited livestock grazing and wildlife habitat. Greenbrae and Haybourne soils are rated as fair to poor for community development and recreation with limitations imposed by slope, flood hazard and dustiness. Soil permeability requires a community sewage system to prevent groundwater contamination. Utility of the Holbrook soils is limited by slope and stoniness, while the Prey sands are subject to erosion and septic seepage.

Minimally developed at the present time, the river corridor consists of irrigated floodplain between the Pine Nut Range and Prison Hill. Predominate vegetation consists of introduced grass species, sage and rabbitbrush. Cottonwood and willow line the river bank with a sparse sage understory. Sage and bitterbrush cover Prison Hill to the west, while the western slopes of the Pine Nut Range are characterized by sparse to moderate pinon and juniper cover with a. sagebrush understory.

This relatively small river, at times more nearly resembling a stream, is an important water source in arid western Nevada. The upper watershed in California is perhaps most noted for its recreational opportunities. In contrast, the lower watershed in Nevada's Carson Sink is characterized by agricultural development created by the Newlands Federal Reclamation Project (California Department of Water Resources 1991). Storage impoundments created by the Lahontan Dam make Lahontan State Recreation Area the most heavily used recreational resource on the lower Carson River. Prior to draining into Carson Sink, the river supports a major wetlands habitat at Carson Lake, the Stillwater National Wildlife Refuge, and the surrounding Stillwater Marsh. This marsh comprises one of Nevada's most important wildlife refuge areas and is extensively used by migratory waterfowl and shore birds. It was also heavily utilized by the area's prehistoric inhabitants.

Gaging stations near Lloyds Bridge and at Deer Run Bridge provide daily discharge records for the river. Gages are monitored by the United States Geological Survey and reports are updated annually. The Lloyds Bridge records currently extend from 1939 to 1994; Deer Run Bridge records run from April 1979 to September 1985, then from August 1990 to 1994. Figure 3 shows monthly discharge in cubic feet per second at both Lloyds and Deer Run Bridge gages (USDI 1994: 206, 215). Highest average discharges occur during May (1151 cfs at Lloyds Bridge, 1223 cfs at Deer Run Bridge) and lowest flows occur in September (455 cfs and 62.7 cfs, respectively). Recorded maximum peak flow at Lloyds Bridge was 4099 cfs in June 1983, with a minimum of 1.96 cfs for September of 1977. While peak flows are highest during late spring, several historic floods coincided with mid winter thaw/warm storm conditions. Average discharge at Deer Run Bridge is slightly higher during peak flow due to a greater drainage area. (958 mi2 to 886 mi2). Annual mean flow at Lloyds Bridge is 392 cfs (1940 1994).

Today, the waters of the Carson River and its tributaries support a variety of uses: supplying municipal water, sustaining fish and wildlife habitat, generating hydro electric power, furnishing river and lake related recreation opportunities, and supplying water for agriculture.

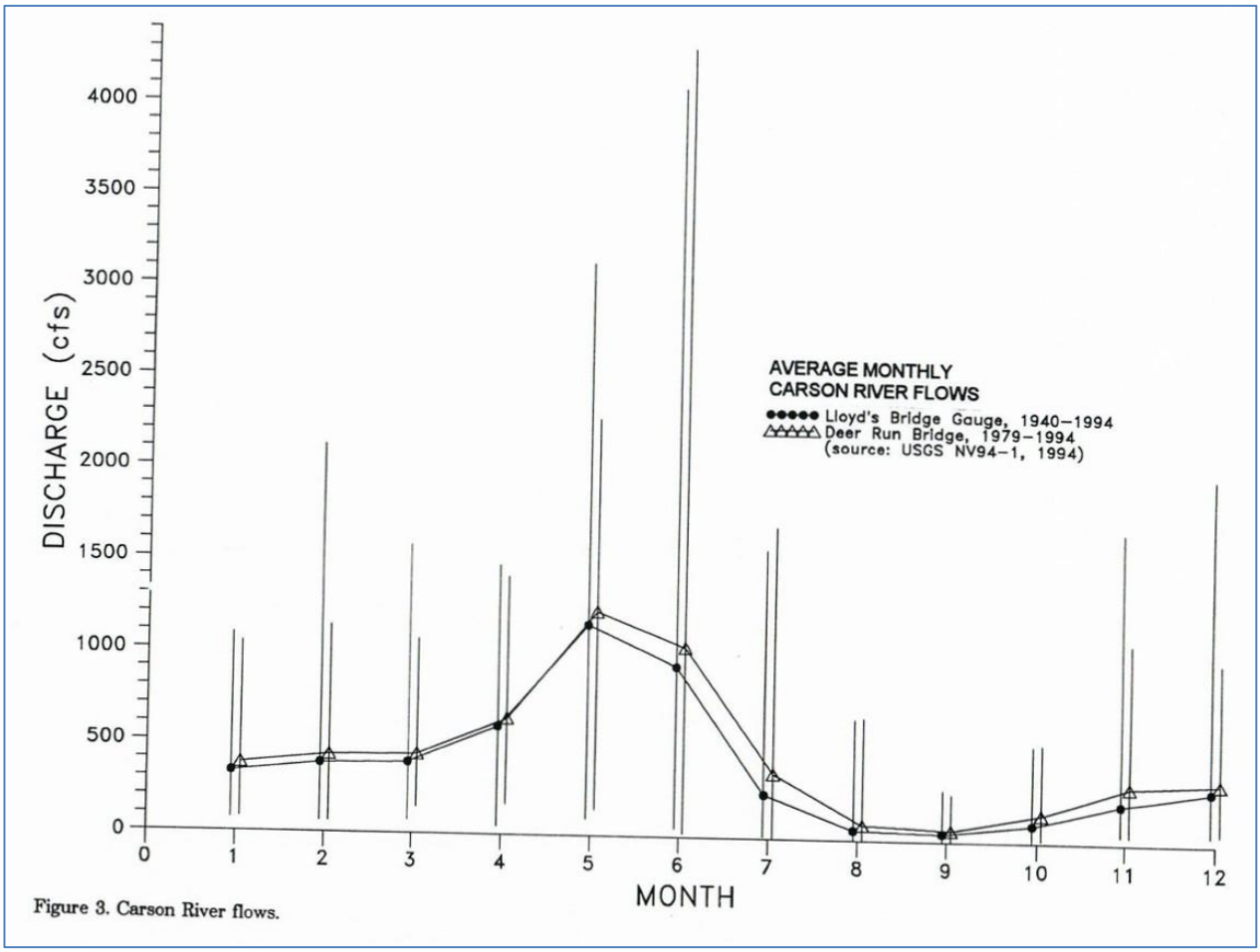

Figure 2- River Flows

Current Condition of the River

The character of the Carson River, as it flows through Carson City, has remained relatively stable over time. Its gentle slope and surrounding topography limit meanders and excessive down cutting or bank erosion, yet short drops provide ample opportunity for whitewater recreation. Flood control and channelization projects are absent from the Carson City segment of the river and few upstream diversions provide relief from historic flood episodes.

For the most part, properties along the river are undeveloped, or minimally developed as agricultural lands. Property lines extend to the Mean High Water Line. The river "bed," as it falls within the mean high water line, belongs to the State of Nevada. However, since the river flows through both Nevada and California, and was historically utilized for interstate commerce, it is also regulated by the United States of America.

Public ownership, as federal, state or locally administered lands, accounts for 25% of the river bank (Figure 4). Most of the public lands are concentrated in the surrounding uplands (the Pine Nut Mountains and Prison Hill). The largest tracts of privately held land are currently under agricultural use, but plans for conversion to residential development are continuously proposed. Several properties, especially along the northern reach of the river along the Carson River Canyon, are not readily developable due to steepness of the slopes.

The undeveloped nature of the Carson River provides unique scenic and recreational opportunities. Views of the Carson River Canyon from the abandoned Virginia &Truckee Railroad (V&T RR) grade rival that of any wild river, while agricultural lands and linear riparian habitats provide a peaceful, pastoral setting. Prehistoric and historic remains relating to Native American use, Comstock mining and early ranching are documented along the river. The remains also provide a number of recreational as well as interpretative opportunities. The River Master Plan and its implementation would provide a means to preserve the unique character of the area by achieving a sensitive balance between development and nature.

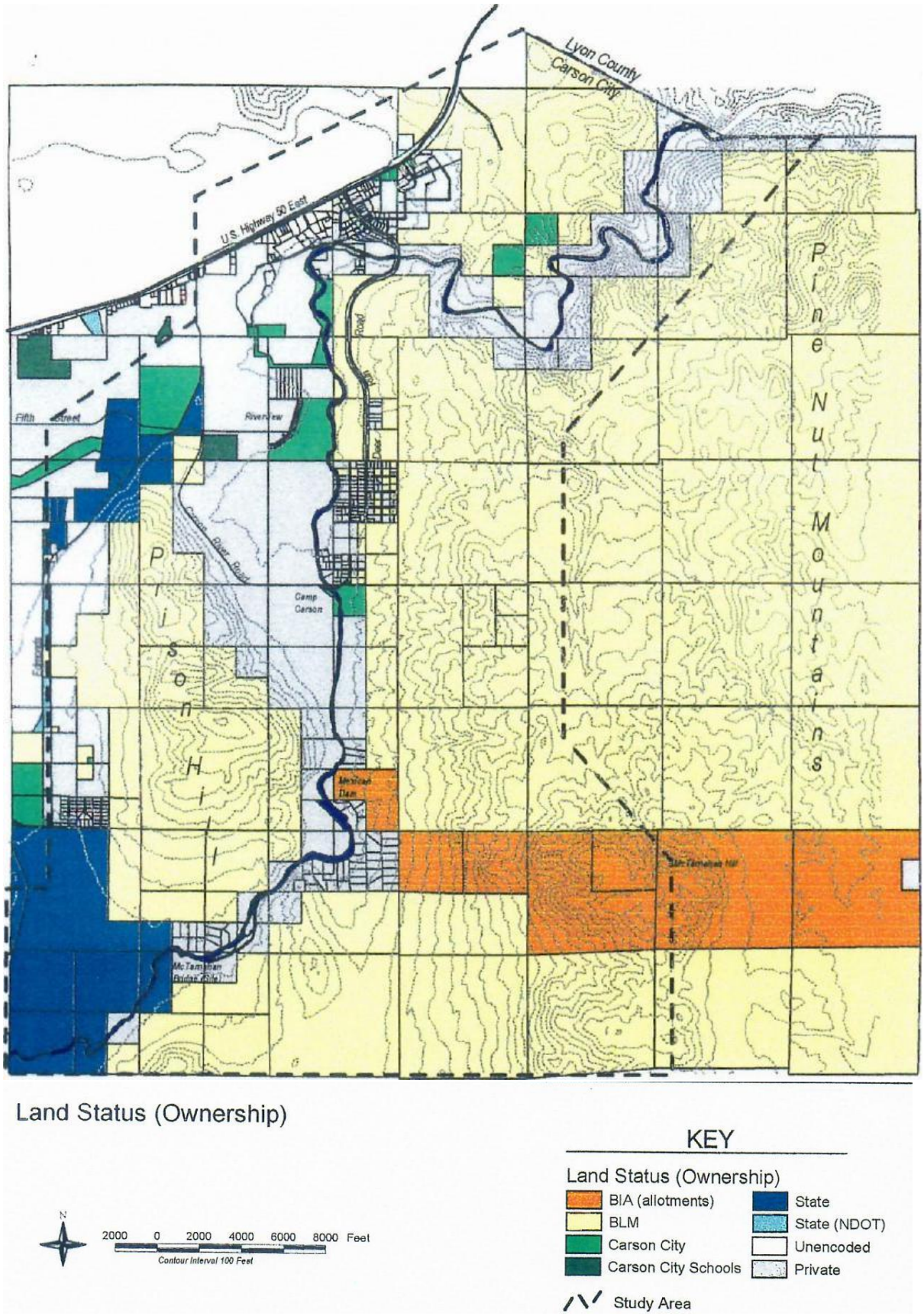

Figure 3- Carson River Area Map

Chapter 3

Wildlife and Wildlife Habitat

This chapter was compiled and written by John R. Warpeha, Carson River Intern. Vern L. Krahn, Park Planner, Carson City Parks & Recreation Department supervised the development of this chapter. The digital mapping and analyses was provided by Gary Juenger, Wildlife Biologist, Dayton Valley Conservation District. Jane Schmidt, Resource Specialist, Natural Resources Conservation Service in Minden, Nevada, provided an evaluation of wildlife habitats and the standardized inventory sheets used to collect data. Daniel Kaffer, Coordinator, Western Nevada RC & D., Inc. in Carson City, Nevada, provided an evaluation of this text and discussion of American Beaver.

Acknowledgments

The following individuals, organizations and agencies contributed to this chapter.

Nancy Bish, Lahontan Audubon Society
E. James Crompton, U.S. Geological Survey
Walt Devaurs, Bureau of Land Management
J. James Eidel, Lahontan Audubon Society
Ted Floyd, Great Basin Bird Observatory
Dan Greytak, Carson City, NV
Cindy Hitchcock, UNR
Jake Jacobsen, Bureau of Land Management
Edwin D. James, Carson Water SD
Daniel L. Jacquet, BLM
Mark Kimbrough, Nevada State Parks
Carl Lackey, Nevada division of Wildlife
Kevin Mack, Great Basin Bird Observatory
Chris Miller, Bureau of Land Management
Walter Mandeville, Biologist for Div. of Wildlife
Eric S. Miskow, Nevada Natural Heritage
Craig Mortimore, Nevada Division of Wildlife
Larry Neel, Nevada Division of Wildlife
Jennifer Newmark, Nevada Natural Heritage
Howard R. Panik, Western Nv Com College
Dave Pickel, Natural Resources Conservation
Paul Pugsley, Upper Carson River CRMP
Pat Sollberger, Nevada Division of Wildlife
Richard Tracy, University of Nevada at Reno
Jack Walters, Lahontan Audubon Society
Robin Williamson, Carson City Supervisor

Prepared for the 2001 Carson River Advisory Committee

Charles Zimmerman, Chairman

Introduction

This chapter describes the wildlife and wildlife habitat of the 15.6 miles of Carson River that flows through Carson City. The term Carson River will cover this 15.6 miles. This revision replaces Chapter 3 of the 1996 Carson River Master Plan. The Humboldt River Study was applied to the Carson River in the 1996 Carson River Master Plan. Field data and observations were collected for wildlife and wildlife habitat for this revision. Carson City in cooperation with the Carson River Advisory Committee should undertake a more comprehensive study of the Carson Rivers wildlife and associated wildlife habitat. A study is necessary for Carson City planning and public knowledge of the Carson River. The inventory in this chapter should be an integral part of the Coordinated Resource Management Plan proposed in Chapter 7. The Carson River forms a riparian corridor from the Sierra Nevada Mountains to the Great Basin and rivers south. The river extends from its Sierra Nevada and Carson range headwater tributaries through the Lahontan Reservoir to the Stillwater Wildlife Refuge and the Carson Sink. The drainage encompasses mountain riparian, foothill and high desert riparian, open water and wetland habitats (Eidel, 2001).

Project Methods and Evaluation

Information was extracted from telephone and face to face interviews. Materials were also obtained from experts on various sub areas of wildlife and wildlife habitat. Nevada State agencies, private organizations and individuals were contacted for resource materials that shed light on the Carson River's wildlife and wildlife habitat. The presence and abundance of birds, mammals, amphibians, reptiles sensitive species, habitat of the river corridor and recreational use were covered by these documents.

An overview of the status of birds, mammals, amphibians, reptiles and habitat was provided by Wildlife Biologist Gary Juenger, Dayton Valley Conservation District, Carson City, Nevada. Jane Schmidt, a Resources Specialist with the United States Department of Agriculture's (USDA) Natural Resource Conservation Service in Minden, Nevada provided a similar evaluation. The intent of this chapter was to provide a baseline of information on wildlife and wildlife habitat of the Carson River. Discussions of birds cover an array of habitats. Local birding interests and ornithological organizations contributed information on bird species, nesting and habitat requirements.

The Carson River corridor was evaluated using the Conservation Corridor Approach. The approach involved examining 1) Primary Zone: the river corridor and 2) Secondary Zone: the floodplain (the floodplain was defined as the hundred year flood line established by the Federal Emergency Management Agency (FEMA)) and 3) Third Zone: the foothills. 1994 United States Geographical Survey (USGS) digital aerial photographs (Appendix 5) of the 15.6 miles of the Carson River were examined to map gross vegetation types/wildlife habitats.

North American Data (NAD) 83 was used to project maps. The maps were completed in Digital Orthoquad Imagery using Arch View 3.2. The Natural Resource Conservation Service provided these maps. The 15.6 miles of the Carson River was divided into eleven map sections. The maps have a scale of 1 inch equals 710 feet. Sections of degraded river corridor were identified on the aerial maps for potential restoration. The findings from these maps are summarized in Data Summary. Standardized inventory sheets (see (Appendix 6) were utilized to collect field data on Carson City and Bureau of Land Management (BLM) owned properties. The Existing Corridor Inventory Worksheet and the Greenline Woody Species Age Class Data Sheet were the instruments used to evaluate the river corridor. The USDA's Natural Resource Conservation Service has adopted these surveys for river corridor evaluation. A working group of the 2000 2001 Carson River Advisory Committee has reviewed these surveys. Field data was collected in March, 2001. Non geographic point 250 foot long by 50 foot wide transects were traversed to obtain data on corridor conditions and age classes. These data are not presented in this revision. A future update of chapter 3 may discuss these data. The data summary section presents acreage totals from habitats on the digital photos. A digital camera provided photographic records of the transects. Commercial and residential areas were not mapped for wildlife habitat.

Habitat Maps

Habitat type maps were developed using ArcView GIS 3.2 software. The software was provided by the Dayton Valley Conservation Service District and the Western Nevada Resource Conservation and Development, Inc. Digital Orthoquad Imagery (DOQ) was provided by Dave Pickel of the USDA Natural Resources Conservation Service in Reno, Nevada.

Gary Juenger, Wildlife Biologist, worked with DOQ imagery to delineate habitat land types and bank corridor conditions along the 15.6 miles of river corridor. The effort was largely performed using aerial photo interpretation without conducting ground truthing controls, due to time constraints. Ground truthing and data collection to describe habitat types was conducted on BLM and Carson City owned properties.

Mapping units were digitized overlaying DOQ imagery projected to NAD 83 datum. The instruments provided a visual image of the habitat types using a colored outline format. The format allowed the underlying photo image to be seen at the same time. The approximate 100 year floodplain boundary obtained from FEMA Flood Insurance Rate Maps was used as the study area boundary. Polygons encompassing the individual habitat types were measured either using a digital planimeter or the ArcView 3.2 software. Total acres were generated for each habitat type by designated stream reach as well as for the

overall study area. The acreage figures are valuable for future study to determine changes in wildlife habitat types over time, or to focus habitat improvement programs for both public and private lands.

Data Summary

The acreage described in this section was calculated from polygons on the digital maps (Appendix 5). There were 2,304.0 acres within the 100 year floodplain. 214.0 acres of the Carson River channel was derived from the 15.6 miles mapped. The following figures were calculated for the habitat types: 40.8 acres of Low Density Fremont Cottonwood; 132.4 acres of Medium Density Fremont Cottonwood; 45.3 acres of High Density Fremont Cottonwood; 1.4 acres of Low Density Willow; 2.8 acres of Medium Density Willow; 3.4 acres of High Density Willow; 70.5 acres of Wet Area; 532.3 acres of Irrigated Field; 12.4 acres of Island habitat; 1.6 acres of Pond; 315.8 acres of Upland Shrub; 36.4 of Meadow; 274.4 acres of Non Shrub Rangeland; 200.0 acres of Abandoned Field; 142 acres of Golf Course and 278.5 acres of other miscellaneous.

Discussion of Data

The possibility exists that some habitat types, particularly willow, are under represented (Juenger,2001). The photo interpreting medium available to capture low density willow is limited. Willow communities along the river are narrow and difficult to delineate with photo imagery.

The cost of up to date color infrared or multi spectral scanner imagery was determined to be prohibitive. The mapping data identified how the habitat types occurred. For example, the multiple small areas of medium density cottonwood stands near Deer Run Bridge (Juenger, 2001). The cottonwood stands near Deer Run Bridge tended to be larger and more continuous. The presence of wet areas occur mainly at the south end of the study area and north of Silver Saddle Ranch.

Restoration Planting Methods

Planting techniques involved seedlings (willow cottonwood), 18 inch willow stakes (with the goal of having four buds per stake), vertically placed willow bundles, horizontally placed willow bundles, by cutting lower stems of willow CA 1 inch) and by cutting branches of cottonwoods from living mature trees and from downed trees. 1/2 inch to 3 inch diameter willow and cottonwood were the diameter sizes used for planting. The lower stems were cut to a sharp angle, with the top cut flat for the willow stakes. Willow and cottonwood stems were inserted (with the angled side down) into the soil down to water level for rooting.

WILDLIFE HABITAT TYPES

The General River Corridor

The Carson River corridor is crucial to the survival of general resident and migrating wildlife populations. The river corridor in Carson City is essential for nesting and migratory birds. Warblers depend on river corridor areas for foraging (Devaurs, 2001). The Dark Eyed Junco (Junco hyemalis) travels from the upper conifer regions of the Sierras to winter in the lower river corridor. They move in response to weather and to find improved forage conditions (Devaurs, 2001).

Wildlife habitat types were defined by Rawlings and Neel (1989) in the 1996 Carson River Master Plan. Five are included in this update: Meadow, Willow, Cottonwood, River Channel/Stream Deposit and Upland Shrub.

The River Channel/Stream Deposit habitat was not mapped, though their discussion is relevant to wildlife populations. Twenty one wildlife habitats and five land types were defined and mapped or discussed with wildlife species habitat use to provide a focused view of the corridor, wildlife and wildlife habitat.

The habitats include Meadow, Willow, Low Density Willow (20% or less crown cover), Medium Density Willow (20% to 60% crown cover), High Density Willow (60% or more crown cover), Fremont Cottonwood, Low Density Fremont Cottonwood (20% orless crown cover), Medium Density Fremont Cottonwood (20% to 60% crown cover), High Density Fremont Cottonwood (60% or more crown cover), Upland Shrub, Agricultural Field, Irrigated Field, Abandoned Field, Wet Area, Oxbow, Island, Irrigation Ditch, Pond, Perennial Stream, Beaver Dam, and Non Shrub Rangeland.

Land types included Intensive Recreation, Developed Recreation, Recreation Area, Golf Course and Restoration Project. Restoration Project (completed), Exposed Bank, Eroded Bank, Recreation Area, Developed Recreation, Intensive Recreation, Golf Course and other miscellaneous are defined under Supplementary Map Types (Appendix 7) that have been completed are also mapped. Two bank corridor conditions were mapped: Exposed Bank and Eroded Bank.

The habitats, land types and bank corridor conditions were digitized and color enhanced on aerial maps (Appendix 5). The FEMA hundred year floodline was also mapped. Restoration areas were planted with Coyote Willows and Fremont Cottonwood to stabilize riverbank sections. Coyote Willow and Fremont Cottonwood trees will be referred to as willow and cottonwood below. A soil survey of Carson City, Nevada (Appendix 12 is included to support habitat types.

River Channel/Stream Deposits

Birds associated with River Channel/Stream Deposit

The physical aspects of river channels and the aquatic life forms they support provide habitat elements required by some species that are not available in adjacent cover types. Birds and mammals depend on river channels as a source of drinking water.

Shorebirds like Killdeer Charadrius vociterus and the Spotted Sandpiper Actitis macularia forage in stream deposits (Neel, 2001). Killdeer occur in low riparian areas of the river (Carson River/New Empire Bird List, 2001). Waterfowl like the Common Merganser Mergus merganser, Mallards Anas platyrhynchos and Canada Goose Branta canadensis commonly use stream deposits as loafing sites and for nesting (Walters, 2001). Gravel from the river edge and bottom are used to aid their digestion. The Great Blue Heron, the Great Egret Ardea alba and the Black Crowned Night Heron depend on river channels and flooded areas to provide fish, frogs and crayfish, all major items in their diet. Bank Swallows nest in the soil ledge on the east side of the river at Carson River Park. American White Pelicans Pelecanus erythrorhnchos and Golden Eagles often feed along the River. The Golden Eagle will nest on cliff edges looking down on the Carson River. Mammals are the primary prey of Golden Eagles (National Audubon Society, 1999). The Bald Eagle, a threatened species in Nevada, winters in the area. Bald Eagles have the potential to breed along the Carson River in Carson City. A pair of Bald Eagles are known to be nesting on Lahontan Reservoir. Ospreys Pandion haliaetus have been observed on the river hunting fish. Osprey and Bald Eagles predominantly prey on fish (National Audubon Society, 1999).

Mammals associated with River Channel/ Stream Deposit

Aquatic mammals like the Northern River Otter and American Beaver spend their lives in the river and den in nearby banks. Northern Otter rarely leave river channels except to nest. This species prefers to remain in the river channel (Lackey, 2001). Beaver will travel to almost any area where there is water however (Lackey, 2001). The Common Muskrat Ondatra zibethicus is present in the main channel, though slower reaches of oxbows and marshy areas are preferred (Neel, 2001). The Mink will prey on the Common Muskrat and the Northern Otter is thought to exist south of Gardnerville Nevada (Mandeville, 2001).

Mink will burrow into stream banks for shelter and forage on freshwater shores (Lackey, 2001; National Audubon Society, 1999). Mink and Northern Otter are highly dependent on fish and frogs for their diet (National Audubon Society, 1999). The Northern Otter's numbers are low in the Carson River. A Northern Otter was observed in the Dayton area in March, 1999 (Panik, 2001).

Coyote Willow "Sandbar Willow"

Coyote Willow Salix exigua occupy moist soils, typically lining channel banks, oxbows and irrigation ditches (National Audubon Society, 1999). Willows maintain the integrity of river systems by stabilizing channel banks and building floodplain by pioneering on stream deposits. The species is able to successfully establish and grow on the harsh environments of gravel stream deposits. Willows slow moving water and trap finer sediments and silts once established. Alluvial soil thereby is built, which may rise above the channel to become part of the floodplain (Carson River Master Plan, 1996).

Willows occur along the Carson River in clusters or continuous stands. The river is denuded of willow in sections from a variety of human uses. The species has been controlled or removed from many parcels for aesthetic purposes; and to clear land for agriculture and to improve cattle grazing. Cattle grazing in river corridors has declined in the last decade however (Juenger, 2001). Soil composition, upstream channeling, river cutting and water table lowering have contributed to the steady decline of willow. These variables stress and eliminate existing willow, inhibit regeneration and threaten the integrity of the stream channel. Habitat, wildlife and water quality in turn are negatively influenced in the immediate area of the river. Upstream and downstream areas are also affected by this degradation (Carson River Master Plan, 1996). The river channel is predominately broad and shallow. The river is no longer able to access natural floodplains (Greytak, 2001). American Beaver Castor canadensis activity and past drought episodes have also facilitated willow and cottonwood decline. Drought has been less of a factor in willow decline in recent years (Juenger, 2001).

Nevada State Prison Lands have experienced degradation. The lands are under review for restoration projects, that would include willow and cottonwood plantings.

Mammals associated with Willow Habitat

A broad spectrum of mammals and birds are associated with willow habitat. The higher diversity of mammals may be attributable to willows providing a corridor of cover along riverbanks through which species can move undetected. Ground and shrub nesting birds have a higher survival rate in this habitat (Fidel, 2001). Willows are an important foraging related component for American Beaver, Northern Otter Lutra canadensis, Mink Mustela

vison, Long Tailed Weasel Mustela frenata, Short Tailed Weasel Mustela ermined, the Common Raccoon Procyon lotor and Mule Deer Odocoileus hemionus (Juenger, 2001). Mule Deer use willow as thermal cover in winter and summer months. The Common Raccoon favors a mixture of cottonwood over story and willow (Devaurs, 2001).

Birds associated with Willow Habitat

Willow habitat is necessary for raptors or birds of prey like the Long Eared Owl Asio otus. The Long Eared Owl nests in willow thickets (Devaurs, 2001; Walters, 2001). The Black Crowned Night Heron Nycticorax nycticorax nests and roosts in willow (Walters, 2001). The Gray Flycatcher Empidonax wrightii and Dusky Flycatcher Empidonax oberholseri forage in willow. Hammond's Flycatcher Empidonax hammondil forages in willow as it migrates through this region (Walters, 2001). The Willow Flycatcher Empidonax traillii, a rare bird in Nevada (Floyd and Mack, 2001) and the Yellow Warbler Dendroica petechia uncommonly nest in willow on the river. The Carson River is within the natural range of the Yellow Warbler (Neel, 2001). Wilson's Warbler Wilsonia pusilla mainly nest in mountain areas (Floyd and Mack, 2001). Two species of sparrow locally nest in willow. The Song Sparrow Melospiza melodia commonly nests in willow. The Lincoln Sparrow Melospiza lincolnii occasionally nests in this vegetation, preferring foot hills and particularly high elevations in the Carson Range for nesting structures (Walters, 2001). The Golden Crowned Sparrow Zonotrichia atricapilla and White Crowned Sparrow Zonotrichia leucophrys forage in willow in winter (Walters, 2001).

The House Wren Troglodytes aedon nests in willow cavities in the spring. The Marsh Wren Cistothorus palustris and Vireos have been observed foraging in willow communities in fall and spring (Fidel, 2001). Vireos tend to forage willow in the early spring (Walters, 2001). Ruby Crowned Kinglets Regulus calendula and Golden Crowned Kinglets Regulus satrapa search for food in willow during fall, winter and spring. Woodpecker species such as the Downy Woodpecker Picoides pubescens forage in willow in the fall and winter (Walters, 2001). The Downy Woodpecker tends to be found more in cottonwood (Neel, 2001). The Yellow Billed Cuckoo Coccyzus Americanus require high density willow (Walters, 2001). Habitats which sustain willow stands interspersed among meadows have greater wildlife diversity.

Fremont Cottonwood

Fremont Cottonwoods Populus fremontii in Nevada occupy the middle portions of streams between higher elevations and bottom land willow communities. General John C. Fremont discovered the Fremont Cottonwood in the 1840's (National Audubon Society, 1998). Cottonwood naturally exists in environments that are delicately balanced between wet and dry. The tree occurs in narrow, periodic strips along the Carson River, except on Nevada

State Prison land in the extreme southwest part of the region (Carson River Master Plan, 1996). Cottonwoods on Prison land are nearly absent and Sandbar Willows are uncommonly sparse. Restoration planning by government agencies and volunteer organizations are beginning to increase these woody communities. The practice of cattle grazing in the river channel and on riverbanks has led to the degradation of riparian habitat, particularly willow and cottonwood. Cattle grazing in riparian zones of the Carson River is declining however (Juenger, 2001).

Willow Fremont Cottonwood Decline

The absence of cottonwood and willow on the Carson River is a major factor degrading the river quality for cold water fish species, like trout (Sollberger, 1995). American Beaver activity and past droughts have led to a sharp decline in cottonwood and willow habitat. Beaver populations continue to have a severe impact on cottonwood and willow in Carson City. A broad range of willow and cottonwood age classes on Carson City owned properties like the Ambrose Carson River Natural Area and Carson River Park have been intensely consumed by beaver. Silver Saddle Ranch in Carson City has also been severely impacted by beaver. Stream banks are weakened when beaver construct lodges and tunnel ways under banks. The stream bank is further undermined when water from spring flooding events surge under the lodges (Kaffer, 2001). The illegal cutting of cottonwood has contributed to the loss of valuable wildlife habitat (Buonamici, 1995). Cottonwood over story, willow and meadow combined are expected to support the majority of animal classifications found in this portion of the Carson River (Neel, 2001).

Mammals associated with Cottonwood

The survival needs of many mammals depend on cottonwood communities. Cottonwood is an important connective habitat to the river (Devaurs, 2001). Weasel and Mule Deer signs are occasionally encountered. Cottonwood provides shade for Mule Deer in summer periods (Neel, 2001). The Common Raccoon nests in cottonwood cavities. Wild Horses will occasionally forage on cottonwood bark. Deer mice and the Long Tailed Vole Microtus longicaudus use cottonwood habitat (Devaurs, 2001). Coyote will hunt in cottonwood for rodents and other prey (Devaurs, 2001).

Birds associated with Cottonwood

The vertical component provided by cottonwood is required by some birds species which is lacking in other vegetation e.g. raptor perches and nesting cavities. Song birds like warblers also need this component. The White Breasted Nuthatch Sitta carolinensis nest at upper elevations in conifer forests and forage along the river in cottonwood (National Audubon Society, 1999; Walters, 2001). Wood Ducks Aix sponsa are well known nesters in cottonwood cavities along the Carson River. The Bullock's Oriole lcterus galbula, which is in the Blackbird family, nests in mature cottonwood in the spring (Walters, 2001). The

nests of this species are sock shaped in appearance. The Yellow Billed Cuckoo Coccyzus americanus will nest in young cottonwood (National Audubon Society, 1999; Walters, 2001) or other mid story trees, though no longer breeds in Northwestern Nevada (Floyd and Mack, 2001). The Yellow Billed Cuckoo, a priority bird of the Nevada Bird Conservation Plan, is rare in the Carson River. The secretive species is known to summer on the river between Lahontan Reservoir and Backland Station (Neel, 2001). The species does nest in the delta east of Alternative 95 (Walters, 2001). A dense mixture of intermediate growth is preferred by this species (Walters, 2001). The Yellow Billed Cuckoo is a candidate for Endangered Species Listing.

The woodpecker family is represented in this habitat by the Northern Flicker Colaptes auratus, the Downy Woodpecker Picoides pubescens and the Hairy Woodpecker Picoides villosus, The latter species commonly forage on decadent and dead wood (Lackey, 2001). The Northern or Red shafted Flicker is common in Carson City. The Rose Breasted Grosbeak Pheucticus ludovicianus, which is a very rare migrant here, can be found in cottonwood (Walters, 2001). Wading birds like the Great Blue Heron Ardea herodias build multiple nests in cottonwood near larger marshes or wetlands (Walters, 2001; Neel, 2001).

Raptors "Birds of Prey" associated with Cottonwood

Cottonwood limbs serve as winter perching sites for Bald Eagles Haliaeetus leucocephalus. A pair of Bald Eagles nested unsuccessfully in a cottonwood tree on the river in Carson City during March April 2001 (Eidel, 2001). Bald Eagles will potentially nest at that site again. Bald Eagles are opportunistic feeders (All the Birds of Prey, 1999). "Most congregate near water and feed on fish, which they catch, scavenge, or steal from others" (All the Birds of Prey, 1999). Golden Eagles Aquila chrysaetos will occasionally nest in cottonwood (Walters, 2001). Red Tailed Hawks Buteo jamaicensis nest in lower density cottonwood. Great Horned Owls Bubo virginianus prefer a wide range of cottonwood density (Walters, 2001). The much smaller Western Screech Owl Otus kennicottii prefer cottonwood cavities and aspen when nesting (Walters, 2001).

Riverine Woodland Birds

Riverine woodland banks offer nesting substrates for specific bird species. Finch family members such as the Lazuli Bunting Passerina amoena and Black Headed Grosbeak Pheucticus melanocephalus nest in riverine woodlands. The Bank Swallow Riparia riparia, Willow Flycatcher, Song Sparrow lcteria Wrens, Common Yellowthroat Geothlypis trichas, and the Yellow Breasted Chat will also take advantage of this habitat (Neel, 2001). The Willow Flycatcher and Yellow breasted Chat are rare or absent from the Carson River (Floyd and Mack, 2001). Riverine woodland is treated only as a subcategory of willow and cottonwood.

River Channel/Stream Deposits

Birds associated with River Channel/ Stream Deposit

The physical aspects of river channels and the aquatic life forms they support provide habitat elements required by some species that are not available in adjacent cover types. Birds and mammals depend on river channels as a source of drinking water. Shorebirds like Killdeer Charadrius vociterus and the Spotted Sandpiper Actitis macularia forage in stream deposits (Neel, 2001).

Killdeer occur in low riparian areas of the river (Carson River/New Empire Bird List, 2001). Waterfowl like the Common Merganser Mergus merganser, Mallards Anas platyrhynchos and Canada Goose Branta canadensis commonly use stream deposits as loafing sites and for nesting (Walters, 2001). Gravel from the river edge and bottom are used to aid their digestion. The Great Blue Heron, the Great Egret Ardea alba and the Black Crowned Night Heron depend on river channels and flooded areas to provide fish, frogs and crayfish, all major items in their diet. Bank Swallows nest in the soil ledge on the east side of the river at Carson River Park. American White Pelicans Pelecanus erythrorhnchos and Golden Eagles often feed along the River. The Golden Eagle will nest on cliff edges looking down on the Carson River. Mammals are the primary prey of Golden Eagles (National Audubon Society, 1999). The Bald Eagle, a threatened species in Nevada, winters in the area. Bald Eagles have the potential to breed along the Carson River in Carson City. A pair of Bald Eagles are known to be nesting on Lahontan Reservoir. Ospreys Pandion haliaetus have been observed on the river hunting fish. Osprey and Bald Eagles predominantly prey on fish (National Audubon Society, 1999).

Mammals associated with River Channel/ Stream Deposit

Aquatic mammals like the Northern River Otter and American Beaver spend their lives in the river and den in nearby banks. Northern Otter rarely leave river channels except to nest. This species prefers to remain in the river channel (Lackey, 2001). Beaver will travel to almost any area where there is water however (Lackey, 2001). The Common Muskrat Ondatra zibethicus is present in the main channel, though slower reaches of oxbows and marshy areas are preferred (Neel, 2001). The Mink will prey on the Common Muskrat and the Northern Otter is thought to exist south of Gardnerville Nevada (Mandeville, 2001). Mink will burrow into stream banks for shelter and forage on freshwater shores (Lackey, 2001; National Audubon Society, 1999). Mink and Northern Otter are highly dependent on fish and frogs for their diet (National Audubon Society, 1999). The Northern Otter's numbers

are low in the Carson River. A Northern Otter was observed in the Dayton area in March, 1999 (Panik, 2001).

Perennial Stream

A perennial stream is a tributary or permanently flowing watercourse that flows into the Carson River. Clear Creek, Ash Canyon Creek, Kings Canyon Creek, North Fork Kings Canyon Creek, and Eagle Valley Creek are examples of perennial streams within Carson City (Crompton, 2001).

Meadow

Meadows are composed of species of grasses, forbs and may contain rushes and sedges. Species composition may vary greatly from site to site with changes in soil moisture. Meadows generally occupy drier soils than cattail, bulrush and willow. Meadow species may invade wetter sites, if other cover types are previously established.

Mammals associated with Meadow

Mammals commonly make use of meadow habitats. The Sagebrush Vole Lagurus curtatus is a smaller mammal that uses meadow as its primary habitat. Silver Saddle Ranch in Carson City has this species (Devaurs, 2001). Coyote Canus latraus will forage in meadow for species like the Sagebrush Vole.

Birds associated with Meadow

The Western Meadowlark Sturnella neglecta and the Horned Lark Eremophila alpestris frequently use meadows for foraging and cover. Meadows with higher moisture provide valuable foraging and nesting habitat for several species of waterfowl like Canada Goose, Cinnamon Teal Anas cyanoptera, Mallards and Gadwalls Anas strepera (Walters, 2001). The Green Winged Teal Anas crecca on rare occasion nests in this type (Neel, 2001).

Soras Porzana carolina and Virginia Rails Rallus limicola, nest in meadow with bulrush and cattails. The Virginia Rail will spend winter in a meadow if there are warm springs or seeps present (Walters, 2001). The Marsh Wren, Red winged Blackbird Agelaius phoeniceus, and Yellow headed Blackbird Xanthocephalus xanthocephalus also nest in meadow with sedges and rushes (Walters, 2001). A more water related species like the American Coot Fulica americana will nest in meadow (Walters, 2001). The Song Sparrow and the Savannah Sparrow Passerculus sandwichensis are examples of sparrows that will nest in densely vegetated meadows (Walters, 2001).

Upland Shrub

Big Sagebrush Artemisia tridentate is the dominant upland shrub of this habitat, with scattered Rubber Rabbitbrush Chrysothamnus nauseosus. Big Sagebrush has been described as the indicator plant of the Great Basin Desert (National Audubon Society, 1999). Single leaf Pinyon Pinus monophylla and the Utah Juniper Juniperus osteosperma are woody tree species found in upland Shrub. The Single leaf Pinyon and Utah Juniper form a different habitat (Neel, 2001). Upland shrubs are often associated with terraces and alluvial fans. Big Sagebrush will encroach onto the floodplain if the water table drops sufficiently. Channel cutting often lowers water tables. The floodplain can become inhabitable to sagebrush. The original floodplain has then developed into a terrace and the river is establishing a new floodplain at a lower level.

Birds associated with Upland Shrub

The Spotted Towhee Pipilo maculatus is commonly observed in Big Sagebrush, Desert Peach Prunus andersonii, Antelope Bitterbrush Purshia tridentata, and Spineless Horsebrush Tetradyvica canesceus communities (Devaurs, 2001). The Common Poorwill Phalaenoptilus nuttallii is present in rocky sagebrush along the river (Walters, 2001). The Black Billed Magpie Pica pica, European Starling Sturnus vulgaris, the House Sparrow or English Sparrow nests around homes and ranches along the river (Walters, 2001). The House Sparrow will also breed in cottonwood (Neel, 2001). The Black Billed Magpie forages in Single leaf Pinyon and Utah Juniper (Walters, 2001). Mature cottonwood, willow and desert shrubs are preferred nesting and foraging habitat of Black Billed Magpies (Walters, 2001). Black Billed Magpies feed on roadkill, eggs and nestlings of other species (National Audubon Society, 1999). The Western Meadowlark is commonly found in upland shrub (Devaurs, 2001). The Black Throated Sparrow Amphispiza bilineata is an common nester in upland shrub. The Gray Flycatcher nests in upland shrub as will the Blue Gray Gnatcatcher Polioptila caerulea (Walters, 2001). The Cassin's Vireo Vireo cassinii is a migrant in fall/spring and forages for insects in upland shrub (Walters, 2001). The Plumbeous Vireo Vireo plumbeus (solitarius) nests in upland shrub (Walters, 2001). The Juniper Titmouse Baeolophus (parus) ridgwayi and the Great Horned Owl nest in Singleleaf Pinyon and Utah Juniper, which occupy the higher elevations of upland shrub (Walters, 2001). The Great Horned Owl hunts rodents in Sing leleaf Pinyon and Utah Juniper and will nest along the river in cottonwood.

Mammals associated with Upland Shrub

The Least Chipmunk Tamias minimus and Deer Mouse Peromyscus maniculatus are the most abundant rodent species present in upland shrub. The Common Raccoon, Coyote and Mule Deer are the most common large mammal species encountered in upland shrub.

Non Shrub Rangeland

Non Shrub Rangeland habitat occurs within the 100 year floodplain at the south end of the study area on Northern Nevada Correctional lands. Native and nonnative perennial grasses and forbs characterize these sites, with a sparse shrub component. The lack of a shrub component and its location in the floodplain distinguish it from areas mapped as upland shrub. Waterfowl and Passerine species use this habitat for nesting and foraging. Bald Eagles and Golden Eagles utilize this habitat primarily as a foraging area in late winter through spring. The land, as its name implies, is used for grazing of dairy and beef cattle as part of the Nevada Prison Industries Program. The presence of wet areas and a perennial stream (Clear Creek in Carson City) in close association with this habitat make it attractive for American Avocet, Black necked Stilt, White faced Ibis Plegadis Chihi, and Willet Catoptrophorus Semipalmatus (Juenger, 2001).

Agricultural Field

An agricultural field will be defined as a field under cultivation for agricultural use like pasture, hay or alfalfa (Juenger, 2001). Agricultural fields are near monoculture stands of a desired crop and are usually planted with grass hay or alfalfa. Irrigated fields will be treated as a subcategory of agricultural field.

Mammals/Birds associated with Agricultural Field

Mammal generalists such as Coyote use agricultural fields to supplement their requirements. Canada Goose are commonly observed foraging in these fields in Carson City in Spring. Northern Pintails Anas acuta, Gadwalls and Mallards forage in this habitat, particularly during flooding episodes (Mandeville, 2001). Northern Pintail are uncommon in the region (Floyd and Mack, 2001). The Horned Lark and Western Meadowlark and the Corvids such as Western Scrub Jay Aphelocoma californica, American Crow Corvus brachyrhynchos, Common Raven Corvus corax, and Black Billed Magpie commonly forage in agricultural fields (Walters, 2001). Shorebirds such as the Long Billed Curlew Numenius americanus, Common Snipe Gallinago gallinago and Killdeer will nest in these fields if conditions are wet. Raptors such as the uncommon Short Eared Owl will nest on the ground in agricultural fields. The Ring Necked Pheasant Phasianus colchicus, which was introduced from Asia (National Audubon Society, 1999), is strongly associated with agricultural fields (Neel, 2001).

Abandoned Field

Abandoned Fields are characterized by the presence of a variety of forbs and shrubs, which have become established in what were once irrigated pasture and hayland fields (Juenger, 2001). The occurrence of shrub and tree forms of willow along field borders adds a component of vegetative diversity. Thus, these areas will support wildlife. Abandoned fields occur at the north end of the study area, largely within the 100 year floodplain. Riverview Park, a City owned recreation area, is described as an abandoned field. The adjoining areas along the Carson River mapped as low and medium density Fremont Cottonwood provide perching and nesting habitat for large raptors such as Red tailed Hawks and Rough legged Hawks Buteo lagopus.

Wet Area

A wet area will be defined as having a surface that is periodically or seasonally submerged by water. Wet areas adjacent or connected to the Carson River attract shore birds like Killdeer and waterfowl like Mallard, Canada Goose, and Northern Pintail.

Birds/Raptors associated with Wet Area

The Common Yellowthroat nests in meadow if Hardstem Bulrushes Scirpus acutus are present which is characteristic of wetland communities (Neel, 2001). The Short Eared Owl Asio flammeus, which is rarely in the Carson Valley, and the Northern Harrier Circus cyaneus nest in wet areas. The Northern Harrier nests on the ground in bulrush (Walters, 2001).

Oxbow

An oxbow is a once flowing remnant of the Carson River channel.

Birds Associated with Oxbow

The Northern Rough winged Swallow Stelgidopteryx serripennis and Violet Green Swallow Tachycineta thalassina forage over oxbows during migration (Eidel, 2001). Species of rails will also forage in oxbows, Songbirds will use oxbows for their food requirements and during migration. For example, the Marsh Wren has been observed foraging and nesting in oxbows. The Common Yellowthroat will nest and use oxbows

during their migration (Walters, 2001). The Great Blue Heron, the Great Egret, and the Snowy Egret Egretta thula search these aquatic environments for amphibians and fish.

Beaver Dam

A beaver dam is defined as a partial or full length structure made of woody debris blocking a watercourse or water movement. Mallards and Canada Goose will nest and forage in these impondments (Walters, 2001). The Eared Grebe Podiceps nigricollis, the Pied Billed Grebe Podilymbus podiceps, the American Coot and rails have been observed nesting on these sites (Walters, 2001). Migrating warblers also use these calmer bodies.

Irrigation Ditch

Irrigation ditches are defined as linear depressions that distribute water to agricultural fields. Irrigation ditches are valuable habitat for foraging waterfowl like ducks and wading birds such as herons. Water levels in irrigation ditches are seasonally manipulated and are therefore temporary corridors for bird species. Egg mortality will occur if situated below the fluctuating water levels. The Great Blue Heron, Black Crowned Night Heron and the Snowy Egret forage irrigation ditches for amphibians and fish. Amphibians like the Pacific Tree Frog Pseudacris regilla will frequent these slower moving water courses (Tracy, 2001). Mink are found in these waterways, though this smaller mammal favors fresh water shores (Lackey, 2001; National Audubon Society, 1999).

Pond

A pond is defined as a permanent water feature that may or may not be fed by a stream or other watercourse. Pond bodies near the Carson River are preferred habitat for species like the Black Crowned Night Heron and Mallards, Cinnamon Teal, Green Winged Teal, Northern Pintail, Northern Shoveler Anas clypeata and Redhead Aythya americana.

Island

Islands will be described as substantially permanent features with perennial vegetation that is not subject to being removed in a hundred year flood event. Islands serve as habitat for Great Blue Herons and Black Crowned Night Herons, particularly if they contain trees (Walters, 2001).

FISHERIES

Fish Stocking

The Carson River has a well documented history of fish stocking since the mid to late 1800's (Carson River Master Plan, 1996). The State of Nevada has stocked several species of fish; Cutthroat Trout Oncorhynchus (Salmo) clarki, Brown Trout Salmo trutta, Brook Trout Salvelinus fontinalis, Rainbow Trout Oncorhynchus mykiss, Atlantic Salmon Salmo salar, Largemouth Bass Micropterus salmoides, Smallmouth Bass Micropterus dolomieu, Channel Catfish lctalurus punctatus and the Common Carp Cyprinus Carpio. Carp were introduced from Eurasia and destroy bottom plants that are required to cover native fish eggs and fry (National Audubon Society, 1999). Three nonindigenous fishes that have been found in the river include Western Mosquitofish Gambusia affinis, Green Sunfish Lepomis cyanellus, and Black Bullhead Ameiurus (lctalurus) melas.

Fishing pressure, the introduction of non indigenous salmonids and exotic fishes, mining, logging, dredging, damming, and elimination of river habitat contributed to the eradication of Lahontan Cutthroat Trout Oncorhynchus clarki henshawi by the 1880's (NDOW Annual Project Report, 2000; Sollberger, 2001). Fish stocking did occur for sometime during and after this (Sollberger, 2001). Lahontan Cutthroat Trout are present in the Carson River System (Sollberger, 2001). The California Department of Fish and Game have populations of Lahontan Cutthroat Trout established in several headwater tributaries in the Carson River Basin (Sollberger, 2001). The Mountain Whitefish Prosopium Williamsoni, Tahoe Sucker C. tahoensis, Lahontan Redside Shiner Richard sonius egregius and the Lahontan Speckled Dace Rhinichtys osculus robustus are native to the basin. Smallmouth Bass, Largemouth Bass, Green Sunfish and Black Bullhead have been stocked in Lahontan Reservoir. Private stocked ponds near the Carson River that have overflowed or irrigation ditches are also sources of introduction (Sollberger, 2001). Information published on fish community structure is available in NDOW Job Progress Reports.

Trout Stocking

Rainbow Trout and Brown Trout are the central fish stocked. Due to the uncertainty of flows and weather conditions in the Carson River, these trout species are generally stocked in March prior to spring flows. Stocking times and numbers depend on water quality (specifically, flow rate and temperature), fish availability and angler use of the river. Flow rates in the summer usually diminish allowing water temperatures to exceed 80 F during the day. Flow rates decrease because of diversions to the water. Water returning to the river from diversions have higher temperatures. Monthly flow variations are shown in (Appendix 8). Data on monthly flows were taken at Deer Run Road in Carson City and the Mexican Dam in Carson City. Trout can generally tolerate temperatures to the upper 70's F. The refuge required for trout species in the Carson River is absent during most summertime conditions however. Trout are therefore stocked from February to March and in the fall. Nevada Division of Wildlife (NDOW) hatcheries stock trout, particularly Rainbow Trout, that have a fork length of 10 inches (Sollberger, 2001). Floodwaters may occasionally develop in spring making the river highly turbid. Trout are then stocked in May or June or just after spring flows and again in September or October when water flows and temperatures permit. The low abundance of trout during the fall suggests limited survival due to intolerable summer water quality or favorable angling success. Rainbow Trout and Brown Trout are managed by NDOW as "put and take" for recreational fishing (Sollberger, 2001). Anglers remove the majority of stocked species.

Recreational Fishing

The Carson River is stocked to provide recreational fishing for anglers. The Carson River Trout Fishery is seasonal and relies on the Nevada Division of Wildlife (NDOW) stocking. Although trout fishing is highly important to local residents, they do fish for Black Bass, Catfish or Green Sunfish. These fish have different environmental constraints than trout, but are present in the river all year long. The river is open to angling year round and 24 hours a day. The river receives heavy angling pressure. Fish limits include: Five Trout, 10 Mountain Whitefish and 15 warm water species of which not more than 5 may be Black Bass. The trout limit was reduced from 10 to 5 in 1994. The limit is currently 5 for trout. There currently are no size restrictions on fish. Drought conditions and increased angling pressure throughout Nevada have caused changes in fishing regulations. Information on fishing regulations is listed in the 2000 2001 Nevada Fishing Regulation Guide. Recreational fishing waters close to Carson City are limited. The Carson River has relatively good shoreline access however. The river is primarily a local fishery. Residents from other counties and states travel to fish the river. Water flow in the river has a strong influence on angler use and catch rates (Sollberger, 1995). Angling declines by midsummer and is low until the fall of the year when stocking resumes (Sollberger, 2001). 1999 mail in questionnaires showed that angler use increased. Anglers caught a record number of fish from both the East and Main Carson River (NDOW Annual Project Report, 2000). The

1999 stocking program was rewarding for anglers, with the vast majority of stocked trout being caught from both rivers. Wild trout were caught in the East Carson River (Sollberger, 2001).

Fish Habitat Conditions

The few fish collected during fall surveys suggest limited survival from poor summer water quality conditions (Sollberger, 1995). Habitat conditions are not adequate for natural propagation of trout. The bottom substrates in the lower Carson River consist primarily of sand, rather than the gravel needed for successful trout spawning. The Carson River fishery in Carson City is seasonal and relies on the stocking of trout. Anglers residing in the Carson City area depend on trout stocking for their opportunities. Smallmouth Bass and Largemouth Bass have not been stocked for many years though they are present. The two species of bass will readily spawn in the river and are a component of recreational fishing (Sollberger, 2001). The abundance of bass is highly variable, but generally low. Anglers catch very few of these warm water species. The limited success of bass reproduction is likely related to poor water quality conditions and limited habitat conditions like backwaters (Sollberger, 2001).

MAMMALS

Large and smaller mammals in the corridor include: American Black Bear Ursus americanus, Mountain Lion Fells concolor, Mule Deer, Wild Horse, Mink, Common Muskrat, Northern Otter, American Badger Taxidea taxus, Gray Fox, Urocyon cineroargenteus, Kit Fox, Vulpes macrotis, American Beaver, Bobcat, Coyote, Common Raccoon, Red Fox Vulpes vulpes, Mountain Cottontail or Nuttall's Cottontail Sylvilagus nuttallii, Black Tailed Jackrabbit Lepus californicus, White Tailed Antelope Squirrel Ammospermophilus leucurus, Desert Woodrat Neotoma lepida, Deer Mouse, Dark Kangaroo Mouse Microdipodops megacephalus, Pale Kangaroo Mouse Microdipodops pallidus, Striped Skunk Mephitis mephitis, California Ground Squirrel Spermophilus beecheyi, Townsend Ground Squirrel Spermophilus townsendii, and the Least Chipmunk.

Large Mammals

The river corridor supports a diversity of large mammals, which have distinct uses for riparian habitat. American Black Bear have been observed in the Pinenut Range east of Carson City. The species uses the corridor for their foraging needs and travel (Devaurs, 2001; Lackey, 2001). Black Bear tracks have been reported along the river between Silver Saddle Ranch and Mexican Dam in Carson City (Devaurs, 2001). Black Bear numbers are

thought to be low in Carson City (Devaurs, 2001). The Lake Tahoe area holds the largest population of Black Bear in Nevada (National Audubon Society, 1999). Mountain Lions, which are a game animal, are infrequently observed with a sparse distribution of 1 per 75 miles (Devaurs, 2001). Populations of Mountain Lion are low to moderate in the Carson River (Lackey, 2001). The Mountain Lion uses the river for foraging and as a travel corridor (Lackey, 2001). The species is Nevada's only big cat.

Mule Deer Population

The overall number of Mule Deer in the greater Carson City area, including the Carson River, continues to decline (Mandeville, 2001). Residential development, vehicle traffic and shooting have increased in areas adjacent to the River. The loss of deer is primarily due to the ever increasing encroachment on winter habitat by people, housing and commercial development. Housing development is occurring on spring habitat that provide deer with high protein feed (Devaurs, 2001). The Mule Deer population as a result remains depressed. Bitterbrush Purshia tridentata, which is a major component of Upland Shrub, is a primary winter food for Mule Deer (Devaurs, 2001). The area between Carson City and Stewart was at one time a primary route for Mule Deer migration from the Sierra Nevada Mountains to the "Sand Flats". Dwellings and businesses now occupy this area, eliminating this migration corridor. Mule Deer in the middle Carson area belong to one of two different herds: One herd is comprised of year round residents and a second herd migrate into the area from the nearby Sierra Nevada Mountains in the late fall (Neel, 2001).

Mule Deer Hunting

The Carson City portion of the Carson River is part of a large hunting Management Area known as Management Area 29. The Nevada Division of Wildlife oversees this and other hunting areas. A limited number of archery, muzzle loader and rifle Mule Deer hunting tags are available in Management Area 29 each hunting season. Trapping is an insignificant activity along the Carson River in the Carson City area. Beaver and Muskrat are trappers' primary focus. A significant number of poaching incidents have been reported in Management Area 29. Mule Deer are commonly the favorite target of poachers.

American Beaver

American Beaver are adapted to rivers and ponds. The species is North America's largest rodent (National Audubon Society, 1999). The perspectives on whether beaver are native to the Carson River System are debatable. According to Lackey (2001), American Beaver are not native to the Carson River System. Beaver were first brought in by stockmen as means of creating summer range water sources (Lackey, 2001), Trappers in the Carson River System during the 1840's however, recorded seeing American Beaver (Devaurs, 2001). Joseph Walker, while working for Captain Bonneville's fur company traveled along the Carson River. Walker reported beaver, though it was unclear whether or not any were

trapped (Devaurs, 2001). The numbers of beaver are high in the Carson City portion of the Carson River. Beaver movements are normally confined to the river channel and their bank lodges. They will cross land to find water however (Lackey, 2001). Beaver activity is crippling the growth of woody species in riparian habitats of the Carson River, as was discussed earlier under Fremont Cottonwood habitat. The succulent samplings of willow are regularly foraged as well. Beaver are single handedly presenting great challenges to organizations attempting to restore the Carson River Watershed. The intensive use of riverbanks and woody species by beaver as forage and building materials has created the urgency to undertake federally sponsored restoration projects. The trapping of beaver has occurred recently in Carson City. Trapping is a favorable method for controlling beaver populations (Lackey, 2001). Wrapping trees with chicken wire has been the principle way to deter beaver from damaging or cutting down Fremont Cottonwood.

Wild Horse

Wild Horses Equus cabal/us are primarily open space mammals. The number of Wild Horse are low in Carson City at this time. The impact of Wild Horses on riparian zones of the Carson River in Carson City are minimal (Jacobsen, 2000). Their influence on Sandbar Willow and Fremont Cottonwood establishment and regeneration in the Carson City area is also negligible (Jacobsen, 2000). Fremont Cottonwood is not normally fed upon by them. Wild Horses will feed on young Sandbar Willows for green feed. The frequency of Sandbar Willow is not influenced by this foraging activity. Spring areas are more disturbed by Wild Horse groups. The availability of feed and the time of season determines Wild Horse movement to riparian areas. The time horses spend on riverbanks of riparian zones is minimal (Jacobsen, 2000). The animals will make more frequent trips to riparian areas during hotter summer periods. Water may be obtained every day during the summer to meet their requirements (Jacobsen, 2000).Wild Horse movement to and from the Carson River is restricted by wire fence on predominantly private holdings. Silver Saddle Ranch in Carson City did experience Wild Horse activity in the riparian area in September and October, 2000. The group of horses was estimated to consist of between 6 8 individuals (Jacobsen, 2000). The horses were present September through October 2000, though they have appeared to have left the area. The BLM will trap horses with alfalfa feed, if these horses remain on Silver Saddle Ranch. Wild Horses are then given for adoption or released in Herd Management Areas. A 1971 United States Federal Law provided this management designation. (Jacobsen, 2000). Wild Horses must be placed in Designated Herd Management Areas, if they are released back into wild conditions. The BLM and the United States Forest Service manage Wild Horses. The origins of the Wild Horses people observe in Carson City are from the western migration movement of the mid 1800's. Private interests during the Great Depression of the 1930's also released Wild Horses into the region (Jacobsen, 2000). (Appendix 9) shows a map of the Pinenut Wild Horse Herd Management Area.

Smaller Mammals

Smaller mammals inhibit the Carson River corridor, The most common are the Mountain Cottontail and Black Tailed Jackrabbit are the most common. Lagomorphs like these favor Upland Shrub, although they are readily found in brush piles (Schmidt, 2001). The Pygmy Rabbit Sylvilagus idahoensis may be present (Mortimore, 2001). American Badgers occur in more upland sites and are not riparian dependent (Mandeville, 2001). Red Foxes have been observed by the BLM Field Office in Carson City, which is situated on the banks of the Carson River (Devaurs, 2001). Two subspecies of bobcat reside in the middle Carson. The Sierra Bobcat, Lynx rufus californicus and the Pallid Bobcat, Lynx rufus pallescens occur within the corridor (Mandeville, 2001). Bobcats den in local canyons (Devaurs, 2001). The Short Tailed Weasel Mustela ermine frequents wet areas of the corridor. The Long Tailed Weasel Mustela frenata favors woodlands and brush, which are an integral part of the river system habitat. Weasel scat was found at Carson River Park in March, 2001 (Devaurs, 2001). Populations of both species of weasel are low in the Carson River (Lackey, 2001). Several rodent species are found in the river corridor in Carson City. Rodents are mostly nocturnal or active at night. The California Ground Squirrel is common in the corridor (Devaurs, 2001) and is adapted to Upland Shrub, particularly Big Sagebrush. The Townsend Ground Squirrel is common in Upland Shrub (Devaurs, 2001). The White Tailed Antelope Squirrel prefers sandier areas and is less common in the Carson City area of the Carson River (Devaurs, 2001). Pinyon Juniper woodlands are commonly home to the Desert Woodrat and the Least Chipmunk (National Audubon Society, 1999), though they also nest in Upland Shrub. Pinyon Juniper fall into the third zone "foothills" of the corridor approach. Deer Mice and Desert Kangaroo Mice are commonly found in more open sagebrush of Upland Shrub. Deer Mice are highly adaptive, occurring near the river or in upland sites (Devaurs, 2001). The Desert Kangaroo Mouse will avoid moonlit nights to conceal itself from predators (National Audubon Society, 1999). The Canyon Mouse Peromyscus crinitus can be found at the base of Prison Hill in Carson City. The species tends to occur away from the river corridor (Devaurs, 2001). The Long Tailed Vole Microtus longicaudus is found at Silver Saddle Ranch in Carson City. The species commonly creates tunnels under the snow (Devaurs, 2001).

Bats

Bat species present in the corridor include: Little Brown Myotis Myotis lucifugus, Long Eared Myotis Myotis evotis, Yuma Myotis Myotis Yumanensis, Fringed Myotis Myotis thysanodes, Pallid Bat Antrozous pallidus, California Myotis Myotis californicus, Long Legged Myotis Myotis volans, Spotted Bat Euderma maculatum, Western Pipistrelle Pipistrellus hesperus, Silver Haired Bat Lasionycteris noctivagans, Hoary Bat Lasiurus cinereus, Big Brown Bat Eptesicus fuscus, Brazilian Free Tailed Bat Tadarida brasiliensis and the Western Small Footed Myotis Myotis ciliolabrum. Bat species use the river for drinking water and for foraging insects (Newmark, 2001).

REPTILES

Reptiles of the Carson River cover a group of species that are found in higher forested elevations to lower riparian conditions. The majority of species described here, including lizards, are found on sites adjacent to the river. The river channel however is rarely a part of their normal habitat. A considerable number of reptiles are both diurnal or active during the day and nocturnal (National Audubon Society, 1999; Panik, 2001). Lizards are more commonly diurnal. Rodents, insects and amphibians are a significant source of prey for reptiles. Twenty two species of reptiles are reported in and along the Carson River. Remnant populations of the Western Pond Turtle Clemmys marmorata are present in Carson Valley (Tracy, 2001). This turtle is considered a "special status" species under the 1970 Endangered Species Act. The Western Pond Turtle is believed to be present in stretches south of Carson City (Tracy, 2001). The turtle is stream dependent (Tracy, 2001). Four Western Pond Turtles were observed for an hour next to the far end of the Eagle Valley Golf Course in Carson City on September 24, 1999 (Panik, 2001). One individual was an adult and the other three were juveniles (Panik, 2001), The habitat they were sighted in was a back water resembling a pond. The presence of a Western Pond Turtle adult with juveniles confirms their reproduction in the Carson River (Panik, 2001).

Lizards

The Western Skink Eumeces skiltonianus is found in shady areas at higher elevations in the corridor (Tracy, 2001). The Western Skink is rarely observed in the Carson River (Panik, 2001). The Long Nose Leopard Lizard Gambelia wislizenii may be found at lower elevations. This lizard species is thought to be rare in the Carson River (Panik, 2001). The lowest elevations are favorable sites to find the Side Blotched Lizard Uta stansburiana, which has many characteristics of the Sagebrush Lizard Sceloporus graciosus. The Sagebrush Lizard is commonly observed in Carson City in rocky ditches and Big Sagebrush. The Sagebrush Lizard and the Side Blotched Lizard avoid each other for competitive reasons (Tracy, 2001). The Western Fence Lizard Sceloporus occidentalis frequents tree lined riparian areas that contain boulders (Tracy, 2001). The Desert Spiny Lizard Sceloporus magister has similar requirements to that of the Western Fence Lizard. The Collared Lizard Crotaphytus collaris particularly prefers canyons and rocky hillsides in the corridor. The Zebra Tailed Lizard Callisaurus draconoides may exist in the corridor (Newmark, 2001). The Yellow Backed Spiny Lizard Sceloporus magister uniformis is found in the corridor (Newmark, 2001). The Western Whiptail Cnemidophorus tigris is an active running lizard that inhibits terrestrial areas like open woodlands at lower elevations (Tracy, 2001; National Audubon Society, 1999). The sandier ground environments of upland shrub habitats are conducive to the Desert Horned Lizard Phrynosoma platyrhinos (Tracy, 2001). The Short Horned Lizard Phrynosoma douglassii is also active in sandy

open areas at lower elevations (National Audubon Society, 1999). Churchill County presently has an abundance of this lizard (Tracy, 2001). Lizards that occur away from the river fall within the third zone "foothills" examined in the corridor approach.

Snakes

Riparian habitat is favored by some snakes, while other species are more adapted to upland conditions. Snakes are often secretive and seldom observed by people (Panik, 2001). The Western Rattlesnake Crotalus viridis is common along the Carson River, where there is rocky habitat with mice populations (Tracy, 2001). The Western Terrestrial Garter Snake Thamnophis elegans is capable of taking advantage of most wet sites bordering the river. The Common Garter Snake Thamnophis sirtalis is a habitat generalist and is locally abundant along the river. The Common King Snake Lampropeltis getulus and the Western Aquatic Garter Snake Thamnophis couchii are most likely present in the middle Carson (Panik, 2001). The Gopher Snake Pituophis catenifer is locally abundant in drier areas and is not associated with any altitude (Tracy, 2001). The Striped Racer Masticophis taeniatus or the Striped Whipsnake and the Coachwhip Masticophis flagellum are not directly associated with riparian habitats, but are present (Tracy, 2001). Woodland edges and grasslands are the primary habitats of these two snakes. The Rubber Boa Lichanura bottae is found on sandy watersides and woodlands in the corridor. The rare if present Ringneck Snake Diadophis punctatus (Panik, 2001) is observed on moister forest floors and brush lands (National Audubon Society, 1999). The Night Snake Hypsiglena torquata is present in wetter higher elevation habitats (Tracy, 1999). The presence of the Ringneck Snake and Night Snake in the middle Carson is doubtful however (Panik, 2001). The Long Nose Snake Rhinocheilus lecontei is similarly uncommon in this region (Panik, 2001). The Western Yellow Bellied Coluber constrictor mormon may be present in the middle Carson (Newmark, 2001)

AMPHIBIANS

The physical and biological aspects of much of the river channel provides habitat that support amphibian life. A sizable portion of upland areas lack the aquatic components required by amphibians. Upland ponds or other larger water bodies will support these species however (Panik, 2001). Amphibian activity predominantly occurs in the warmer months of the year. Amphibians especially breed in slower moving stretches of the river and oxbows (Tracy, 2001). The eggs of the young are laid in sedge or reed habitat near the waters edge. The hatchlings develop into larvae in shallow water called tadpoles (Panik, 2001).

Frogs and Toads

Five species of amphibians are likely found in the Carson River at present. The Great Basin Spadefoot Spea intermontana is described as a habitat generalist, preferring most types of

wet habitats (Tracy, 2001). The Pacific Tree Frog Pseudacris regilla or Pacific Chorus Frog is found in the river in most wet sites (Tracy, 2001). The Western Toad Bufo boreas is found in oxbows and backwaters of the river. The Boreal Toad Bufo boreas boreas is present in stream areas in the corridor (Newmark, 2001). The Mountain Yellow Legged Frog Rana muscosa is present in riparian sites, ponds and oxbows of rivers (Tracy, 2001). Canyons along the river that have riparian characteristics may support this species (Tracy, 2001). Mountain Yellow Legged individuals have been historically found in the Sierra Nevada Mountain Range above 6,000 feet elevation and not beyond the eastern slopes (Nevada Division of Wildlife). The Nevada Division of Wildlife (NDOW) does not believe that the main stem of the Carson River has been part of the Mountain Yellow Legged Frog's natural range (NDOW, 2001). The Mountain Yellow Legged Frog is highly unlikely in the middle Carson however (Panik, 2001). The Northern Leopard Frog Rana pipiens has historically been present in the Carson River. However, the current status of this species is unknown (Tracy, 2001). A single Northern Leopard Frog was found in the Carson Valley near the Minden area in the fall of 2000 (Panik and Hitchcock, 2001). The Northern Leopard Frog is believed to be rare in the Carson River (Panik, 2001).

Amphibian Predation and Decline

Amphibian life at all stages of development is a major source of diet for wading birds including the Great Blue Heron and the Black Crowned Night Heron. Mammals that forage streamsides and backwaters like the Common Raccoon prey on amphibians. World wide amphibian populations are declining and the Carson River is no exception (Panik, 2001). The full scope of the reasons for their decline is not known (Panik, 2001). Habitat destruction, introduction of exotics like Bullfrogs Rana catesbeiana, predation and other factors like fungal diseases and insecticides/pesticides are some of the factors that may be contributing to amphibian decline (Panik, 2001). Amphibian larvae and juveniles are consumed by foraging trout (Panik, 2001). Tracy (2001) also noted that trout , particularly Rainbow Trout, consume developing native amphibians. Crayfish and other species will also consume amphibian eggs (Panik, 2001). Non native species have likely contributed to the decline of Nevada's native amphibians (Panik, 2001). Bullfrogs are present in the Carson River. This larger amphibian was introduced from the Eastern United States (National Audubon Society, 1999). Nevada's native frogs may be impacted by the aggressive feeding habits of Bullfrogs (Panik, 2001). Fledgling birds, snakes and other animals are consumed by Bullfrogs (Panik, 2001). Bullfrogs are prolific and occupy more disturbed areas near stream edges (Panik, 2001; Hitchcock, 2001). The amphibian is very common in the Carson River and is a game species. (Panik, 2001).

BIRDS

Riparian corridors like the Carson River are essential feeding stop overs for migrating songbirds (Eidel, 2001). The corridors are critical breeding grounds for year round residents and migratory species (Eidel, 2001). Species are breeding in reduced numbers in the corridor. The decline in breeding has occurred from the turn of the century. Birds species use these corridors each year to migrate to lower altitudes and to Mexican or Central American wintering grounds (Eidel, 2001). Birds then commonly return the following spring.

The Golden Eagle and Downy Woodpecker are examples of year round residents, while theMacGillivray's Warbler's migratory (Eidel, 2001). The Yellow Billed Cuckoo historically bred along the river (see earlier discussion on page 8). The species apparently no longer breeds because of habitat degradation (Eidel, 2001). "Accidental" species occur like the Red Eyed Vireo Vireo olivaceus or eastern warblers that have failed to migrate on traditional routes (Eidel, 2001). A great diversity of bird species frequent the Carson River corridor. A considerable amount of observations has been obtained on birds. Bird field observations (Appendix 11) near Carson River Park, Silver Saddle Ranch and Brunswick Canyon by the Carson River were conducted in 2001. (The Long Billed Curlew Numenius americanus and Short Eared Owl are also priority species for the 1999 Nevada Bird Conservation Plan.)

Game Bird Species

Game birds provide sport hunting along the river in fall. Legal sport hunting consists of two basic types: Upland Game and Migratory (Neel, 2001). Upland Game species include Chukar Alectoris chukar and California Quail Callipeplacalifornica. California Quail are found in upland shrub and easily observed in residential areas of Carson City, provided yards have shrub cover. California Quail are also commonly observed near the roads in Big Sagebrush at Silver Saddle Ranch in Carson City. The hunting season for Chukar and Quail is normally from early October to early January. Mourning Doves Zenaida macroura, ducks and geese comprise the hunted migratory bird species (Neel, 2001). Waterfowl hunting season also extends from early October to early January. Duck and goose hunters normally walk along riverbanks for "Jump Shooting" or from concealed blinds along the river's edge. Dove hunting is more limited, beginning on September 1st and lasting only a few days due to the rapidly cooling weather in northern Nevada.

Carson River Priority Birds

The following birds are discussed in the 1999 Nevada Partners in Flight: Bird Conservation Plan (Eidel, 2001). Restoration of habitats along the Carson River may encourage the establishment of Priority Species discussed in the Bird Conservation Plan (Eidel, 2001). Priority bird species were determined by the CBO Total Score, ESA, Habitat Threat, Importance of Area, Low Number and or Isolated Population, Population Decline, Unique Representation of a Habitat Type, Umbrella Species and Unknown Category (Nevada Partners in Flight: Bird Conservation Plan, 1999). Priority Species include the Yellow Billed Cuckoo, Bank Swallow, the Western Bluebird Sialia mexicana (migratory and a potential breeder), Wilson's Warbler (migrant), MacGillivray's Warbler Oporomis tolmiei (migrant), Cooper's Hawk Accipiter cooperii (potential nester), the Yellow Breasted Chat (migratory and potential breeder, Eidel, 2001) and the Calliope Hummingbird SteHula calliope (potential breeder, Eidel, 2001). Calliope Hummingbirds breed at Davis Creek Park in Washoe Valley, Nevada and nest in Jeffrey Pine Pinus Jeffreyi (Eidel. 2001). Orange Crowned Warblers Vermivora celata and Gray Flycatchers migrate along the river. The Willow Flycatcher Empidonax traillii is also on this priority list. Lowland Riparian and Montaine Riparian habitat, as discussed in the context of the Bird Conservation Plan, are the focus habitats in the Carson River that covered these 14 priority bird species. Virginia's Warbler Vermivora virginiae has been noted in the Carson River drainage (Eidel, 2001). The Orange Crowned Warbler, Virginia's Warbler and the Gray Flycatcher require special management as recommended in the Nevada Bird Conservation Plan.

Carson City Bird List

222 bird species listed in (Appendix 11) are found in the Carson River. Ten accidental species are listed at the end. (Appendix 11) was compiled from lists including Dayton State Park (compiled by Glen R. Gill), the Carson City District BLM Bird List, the Nevada Breeding Bird Atlas Block at New Empire and from personal observations of Jim Eidel of Lahontan Audubon Society. Jack Walters of Lahontan Audubon Society provided field notes and detailed observations relating to species seasonal location, abundance, rarity, vagrancy and whether species are common or nest along the river. (Appendix 11) is a comprehensive list to the bird life occurring along the Carson River.

CARSON CITY SENSITIVE AND RARE SPECIES

The Nevada Natural Heritage Program has identified sensitive and rare species in Carson County. (Appendix 13), Sensitive Species Locations, shows a map of the sensitive species locations in Carson County. The Carson Valley Wood Nymph Cercyonis pegala carsonensis is a sensitive species found closest to the Carson River corridor. The species develops into its terrestrial form in June (Miskow, 2001). (Appendix 13) presents a List of

Sensitive Species covering plants, invertebrates, reptiles, mammals, and bird species occurring in Carson City District. (Appendix 13) provides Carson City Rare Species List for February, 2001 including sensitive taxa, amphibians, reptiles, mammals, and birds; and Watch List Taxa: Dicots, Annelids, mammals and birds.

OPPORTUNITIES

- Heighten public awareness of the wildlife/wildlife habitat value of the Carson River corridor.
- Riparian and wetland areas need to be expanded through mitigation sites.
- Increase water flow in the river with affluent and flood water.
- Maintain flood irrigation management on Silver Saddle Ranch to:
- Provide habitat for wading and water birds such as American Avocet and White Faced Ibis
- Maintain existing riparian vegetation zones attributable to Mexican Ditch and the current water distribution system
- Protect existing cottonwood galleries and attempt to establish new pole plantings to replace over mature stands. Cottonwood provides habitat for Passerines, Raptors and nesting Wood Ducks.
- Maintain and expand shallow water wetland areas to provide habitat for waterfowl, wading birds, and shorebirds.
- Encourage the use of conservation buffer zones along drainage ditches and field edges.
- Bald Eagles have the potential and should be encouraged to nest in Carson City; and will require protection once nesting sites are established.

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Chapter 4

River History

Prehistory of the Area

Prehistorically, the river and its surrounding environs provided resources critical to the survival of the Washoe Indians and their ancestral counterparts. Although traditional boundaries were somewhat fluid, the Washoe territory roughly extends from Doyle south to Markleeville then east from the Sierra Nevada crest to the Pine Nut Range (Figure 7; Downs 1966:2; Price 1962:77). Ethnographic data concerning the Washoe may be found in d'Azevedo 1956, 1963, 1986; Curtis 1926; Dangberg 1968; Downs 1966; Nevers 1976; Price 1962, 1980; and Stewart 1941.

Organized into extended family groups, the Washoe exploited seasonally available resources within their territory. Campsites were established at Lake Tahoe during the late spring and summer, then relocated in the valleys east of the mountains for the winter season. Villages consisted of between two and ten semicircular brush and rock shelters with the winter quarters being somewhat larger and more permanent. Each household occupied a winter house or *galls dangle,* that measured four to five meters in diameter with a central hearth and east facing doorway. Winter sites were chosen for proximity to water and the sunny aspect of surrounding topography.

Seed resources, roots, and greens were collected on a daily basis and either consumed immediately or cached for later use. Pine nuts were harvested in the fall and cached in grass lined, rock covered pits. Game was hunted individually or by groups and fishing provided a reliable and storable protein resource.

Estimates of Washoe population at the time of European contact, vary widely from 1000 to 3000+ individuals. Washoe mythology describes a "great white rock" a little east of Stewart (after Price 1962:Plate I) near McTarnahan Bridge as *gewe magum;* a place where Coyote tried to smoke out Weasel. The Washoe name for the low hills sloping west to Stewart and dividing Eagle and Carson valleys is reported to be *dawmaladaubana'; balna't'san wa't'a* and was the main Washoe settlement in Eagle Valley; and *usewi wa'ta* is the Washoe name for Clear Creek (d'Azevedo n.d. 1978 3940).

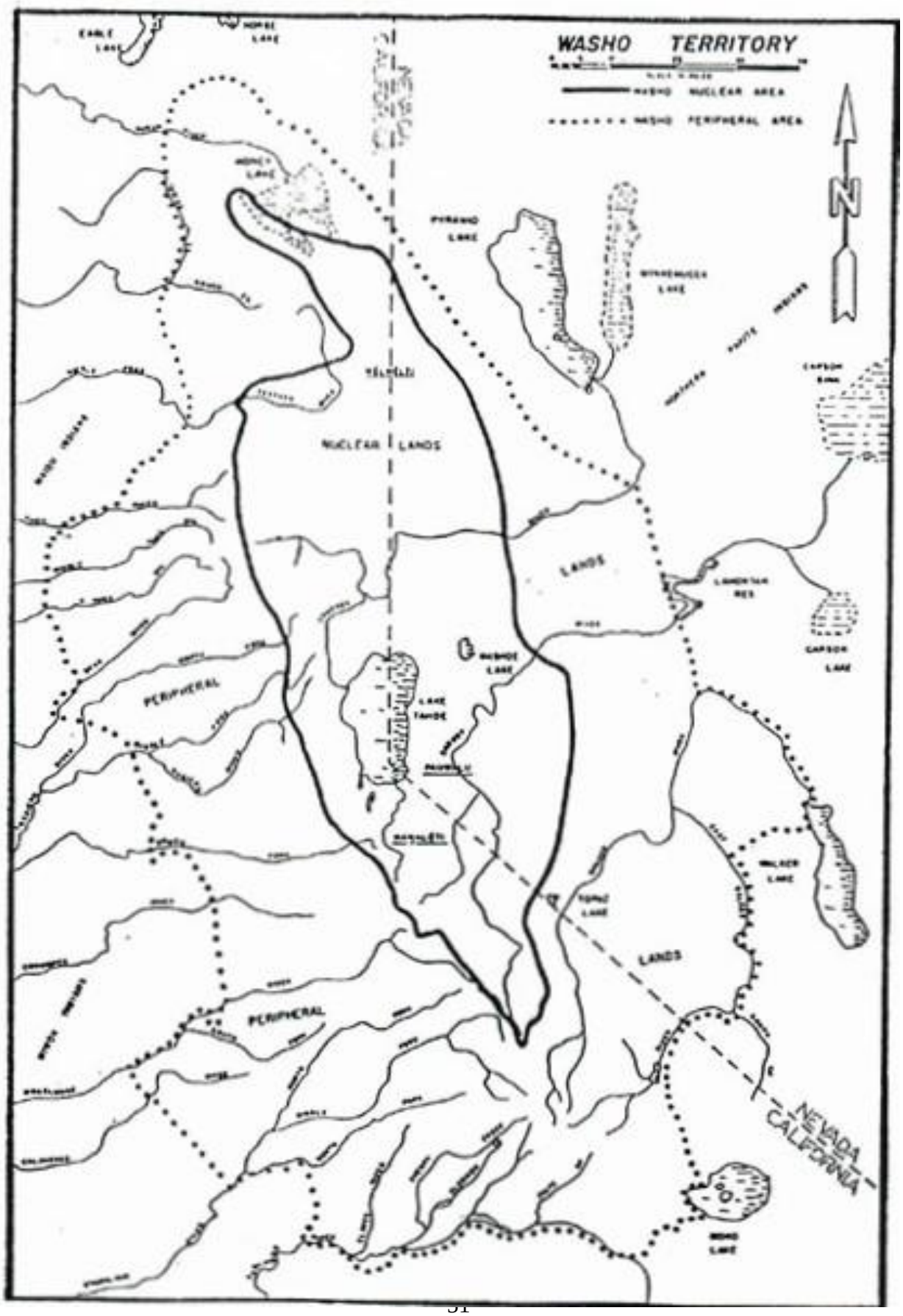

Figure 4- Washo Territory

History of the Area

The first Euro Americans to pass through the region were Joseph Walker's party of trappers in 1833 1834. John C. Fremont pioneered a trail south of the California Trail through Eagle Valley, opening up a travel route for California bound immigrants in 1844. He named the river paralleling the route for his scout, Kit Carson. The Carson River Route of the Overland Trail diverged near Empire, the main branch continuing west to Eagle Station with an eastern route following the Carson River into Carson Valley (Pendleton et al. 1982). The route then crossed the Sierra Nevada Range at either Carson or Ebbetts pass (Simpson 1876).

Simpson's overland route proved to be a feasible communications link between the eastern United States and the western frontier as demonstrated by the inauguration of Russell, Majors and Waddells Pony Express on April 3, 1860. While the overland mail was discontinued by October 24, 1861, the saga of the Pony Express has become a significant part of American history (Hardesty 1979).

During the early 1850s Mormon farmers and traders established trading posts along the Overland Trail, settling Eagle and Carson Valleys. Seeking gold along the eastern slopes of the Sierra in 1851, Frank and W.L. Hall, Joseph and Frank Barnard, A.W. Rollins and George Follensbee settled in the area and established a trading post called Eagle Station (Angel 1881). As the enterprise grew, the holding became known as Eagle Ranch and the surrounding valley as Eagle Valley. By 1858 Eagle Ranch and most of Eagle Valley was owned by Abraham Curry. Curry later subdivided a portion of the ranch into lots which became the nucleus of Carson City. Nevada achieved statehood in 1864 and Carson City was named the state capital (Angel 1881).

With the discovery of gold and silver at Virginia City in 1859, Carson City became a major supply point for the Comstock. Its role as a supply hub was strengthened after the construction of the Virginia and Truckee Railroad in 1869 and subsequent connection in 1872 with the Central Pacific Railroad at Reno (Myrick 1962).

Mining, transportation and ranching remained the dominant economic themes of the area throughout the mid and late 19th century. In the 1850s Nicholas "Dutch Nick" Ambrose established a ranch along the Overland Trail, and the townsite of Empire was platted there in March of 1860. During the 1860s a "plank and turnpike" road between Carson City and Empire served as the primary route to the Comstock. By the mid 1860s Empire consisted of several stores and a hotel, operated by "Dutch Nick" Ambrose (Angel 1881). Stables and a blacksmith shop were located south of town, closer to the river where access to water was more convenient. Early residents of Empire called it Seaport Town due to frequent spring flooding along the Carson River (Plate 1; Carlson 1974).

Industry at Empire was always tied to the needs of the Comstock. In 1862, Hobbs, Russell and Company were granted an exclusive franchise to raft logs, firewood and lumber down the Carson River (Knowles 1942). Wood was cut in Alpine County, placed in the river and floated downstream where it was caught by large booms stretched across the river. Wood rafts took 40

days to arrive at Empire. The wood was then transported to a sawmill 1/4 mile south of town, cut, and stored in local wood yards until it was sent to the Comstock by wagon, or, after 1869, by railcar (Plate 2). The extension of the Virginia & Truckee Railroad (V&T RR) to Carson City brought increased competition in the lumber industry and eventually led to the decline of the sawmill at Empire.

The major purpose for the construction of the V&T RR was to transport ore from the mines along the Comstock to mills along the Carson River. In 1860, the first mill, known as the Silver State Reduction Works and later the Spanish or Mexican Mill, was built near Empire by Hobbs, Russell and Company (Basso 1972). The present Darling Ranch House was built as the home for the Mexican Mill superintendent. Water to power Mexican Mill was diverted from the Carson River at Mexican Dam and transported to Empire via the Mexican Ditch. The Mexican Ditch was the first diversion of its kind in the state (Dangberg 1975).

During the Comstock boom, sixteen mills were located along the Carson River between Empire and Dayton (Figure 8; Basso 1972). Each mill would typically construct a timber diversion dam in the river channel to direct water into its flume system. Most mills used large wooden pelton wheels (the direct inspiration for the Ferris Wheel) to power their stamps and to generate electricity. The diversion of Carson River water fueled upstream water rights controversies between agricultural and milling interests into the 20th century. Collectively known as the Union Mill cases, litigation produced important Federal Case Law regarding doctrines of riparianism and appropriation (Dangberg 1975).

Agriculture became a dominant commercial theme as mine productivity declined. By 1880, eight thousand acres of Ormsby County were under agricultural production, but due to a lack of suitable irrigation, only 1164 acres were actively cultivated. The Andersons, Quilicis and Cooks were among the pioneer agricultural land holders along the river. Agricultural lands now operated by the Nevada State Medium Security Prison were once part of the Dangberg and Schulz Ranch.

Figure 5 Flood at Empire (1)

Figure 7- Flood at Empire (2)

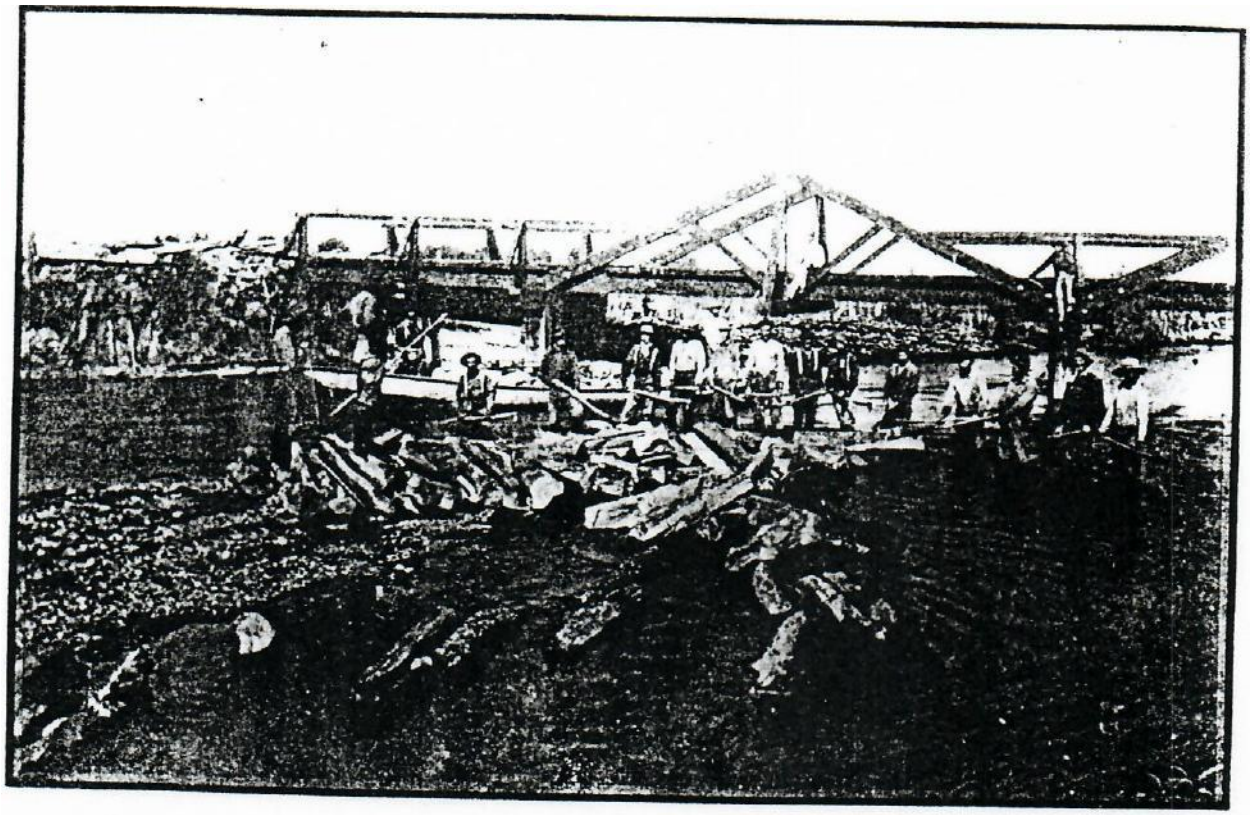

Figure 6-Wood Drive on the Carson River

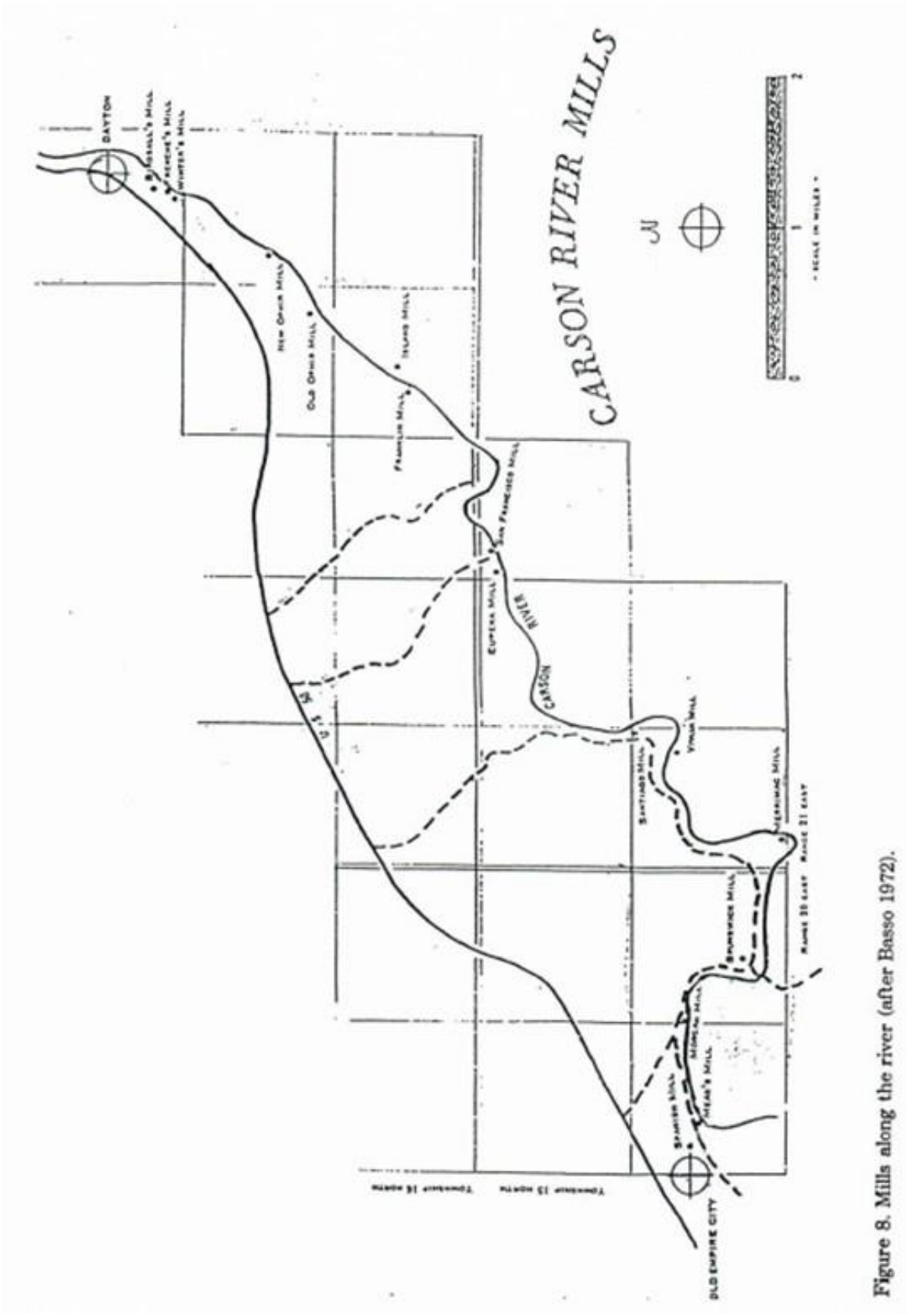

Figure 8- Carson River Mill Sites

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Chapter 5

Current Visitor Recreational Uses and Demand

Study Area

To further simplify this plan the River will be divided into three specific land areas (Figure 9):

SOUTHERN Douglas Co to McTarnahan Bridge site (2.3 miles)

This section of the river is primarily owned by the State of Nevada and managed by the State Prison system. It is undeveloped and used primarily for agriculture. In Douglas County there is a new large development under construction near the river which may create an impact in the future.

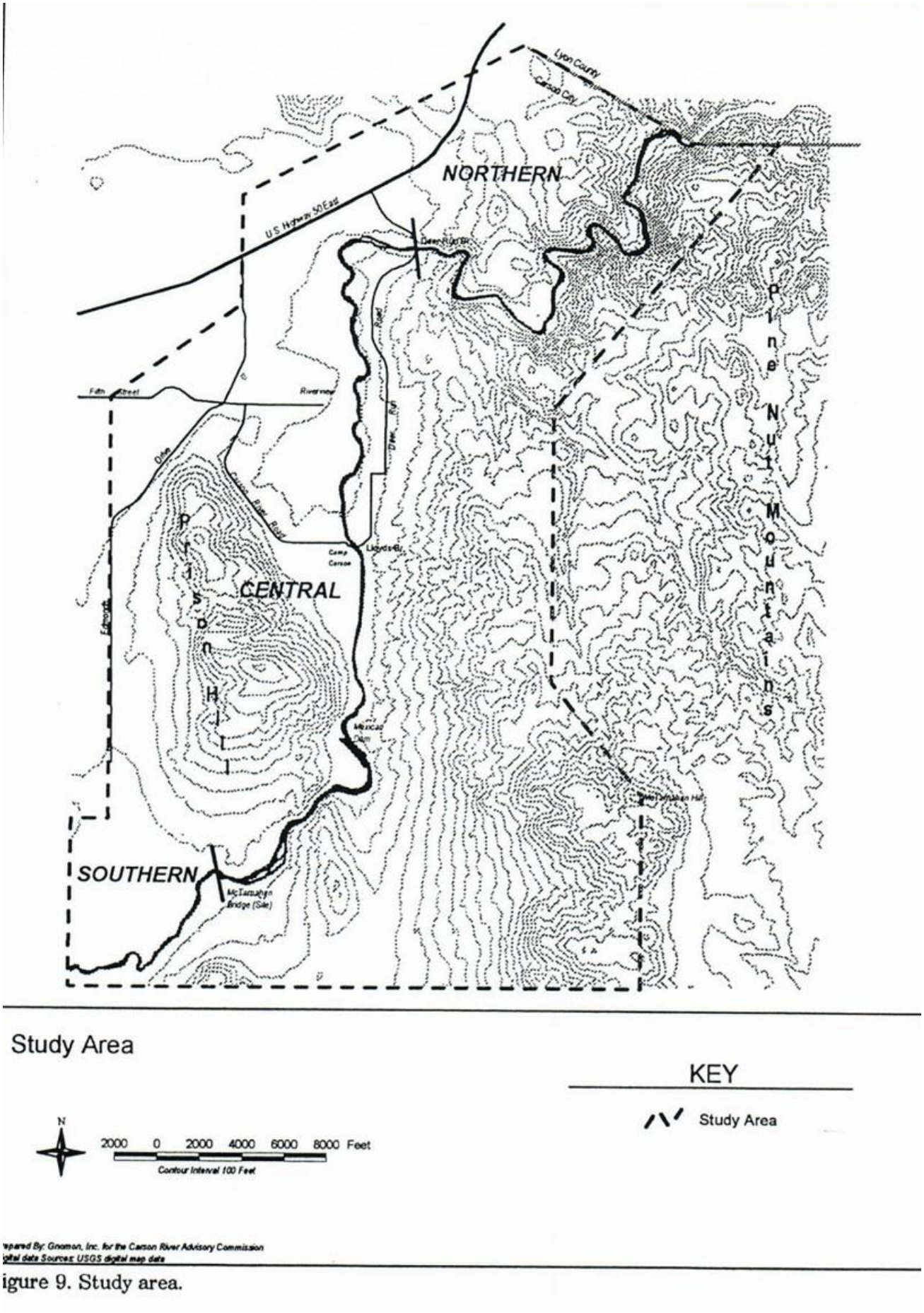
CENTRAL McTarnahan Bridge site to Deer Run Bridge (8 miles)

This section of the river is has the most development. There are many single family homes, as well as agricultural lands. The greatest potential for privately owned large parcels and subdivisions development is in this area. Three recreation areas are also in this section. Most of the recommended development proposed in this plan is along this section of the river.

NORTHERN Deer Run Bridge to Lyon County line (5.3 miles)

This section is mostly undeveloped except for one commercial/industrial extraction operation. A segment of the V&T Railroad is proposed along this section of the river.

The actual study area is not defined just by the course of the river. The Committee's primary emphasis is on land along the river, but the trail plan connects the river corridor to other Carson City recreational areas. The proposed trails and recreational development areas (see Figure 18) delineate the study area for this plan.



igure 9. Study area.

Figure 9- Study Area

Existing Public Facilities on the River

Public facilities along the river are managed and maintained by several entities including, Carson City, the State of Nevada and the federal government Figure 10.

City Ownership

CarsonRiver Park

This is a 40 acre parcel bisected by the river. A portion of the property is in the Nevada Department of Transportation (NDOT) right of way. The area on the western side of the river has a paved access and the old highway is now a parking area. The eastern side has an area that was used as a borrow pit for fill material. This area is currently used by Off Highway Vehicles (OHVs) and is also a terminus for more than one drainage. Both sides of the river have vehicular traffic along the banks and are heavily used. A restroom located on the western side has been closed for some time due to excessive vandalism. There are water, septic, and electric utilities on the site.

Riverview

This 100 acre parcel extends from the western bank of the river up to the Riverview subdivision. The existing facilities include a covered shelter with electricity, picnic tables, BBQs, restroom, and 1.6 miles of trail. The property crosses the river with one small section on the eastern bank. An area on the western side of the river will be restored to wetlands as part of the Empire Ranch Development mitigation agreement.

Silver Saddle Ranch / Mexican Ditch

This feature parallels the river along its western side from Mexican Dam to the terminus at the Darling Ranch near Empire. It has been used to power quartz mills and for irrigation since the mid 1800s. Currently, the city has ownership and right of way to some sections. For the most part, there is no public access along the Ditch.

Carson Creek Properties

These properties, along the southwestern corner of the Empire Ranch, are currently in city ownership. This property will be used to provide access to the river. If the linear park is completed, Carson Creek properties will tie into the new Empire Ranch and the BLM/Carson properties.

Empire Ranch Properties

The Empire Ranch properties lie adjacent to the Carson River along its western bank. Directly across the river are the **BLM** properties currently used in cooperative agreement with the city.

Linear Corridor Park

The city has started to develop a linear park from Hwy 395 near the junction with Stewart Street to the river. There are some properties under public ownership and some of the established trail sections are already in use.

Empire Cemetery

The Empire Cemetery is located north of Morgan Mill Road, behind Capital City Concrete, near the Darling Ranch. The cemetery dates to the mid 1800s and is maintained by the Parks and Recreation Department.

Federal Properties

Bureau of Land Management

Prison Hill

The large hill between the Pine Nut Range and Carson City, just east of Edmonds Drive, is under public ownership. A designated OEW area has been established on part of this hill. Sections of Prison Hill not designated for OHVs provide a recreation area for equestrians, bicyclists, hikers and joggers.

Carson River Properties [Joint Management w/city]

This is the largest tract of accessible public land along the river and is located just across from the New Empire Ranch properties. This parcel added significantly to city ownership along the river. These properties are not heavily used at this time. BLM is currently reviewing the uses of this site in their Pine Nut Mountain plan review.

Pine Nut Mountains

The Pine Nut Mountains are one of the first ranges east of the Sierra in the Great Basin. This mountain range, just east of the Carson River, is known for its juniper and pinyon. The BLM has recently initiated an update of their master plan for this area. The study will include a review of OHV use, fire hazards and visual classification. The Committee has sent a letter to BLM with its recommendations for this area (Appendix 2).

Bureau Of Indian Affairs [BIA]

The Washoe Tribe has family allotments in the Pine Nut Mountains. Some of these allotments are adjacent to the river, and the BIA manages these properties.

State Properties

Prison Properties

Southern

Within Carson City, the properties along the river from the Douglas County line to the McTarnahan Bridge site are primarily Nevada state land controlled and managed by the

State Prison system. These properties are primarily used for agricultural endeavors and are essentially undisturbed on the southeastern side. The public is restricted from the northwestern side properties.

Northern

Near the junction of 5th Street, Edmonds Drive and Carson River Road, the Nevada state land is controlled and managed by the prison system. These properties adjoin the BLM's Prison Hill. Equestrians, hikers, and joggers currently utilize the area. The BLM recently installed a minimal trailhead parking area on the northernmost edge of these properties.

Private Properties

The heaviest use along the river primarily occurs on private properties. The areas with the most concentrated use are the properties near Deer Run Bridge and the eastern side of the river from Mexican Dam to Lloyds Bridge. This plan makes recommendations to establish public facilities and access to public lands to resolve and mitigate the trespass and incompatible use issues on private properties.

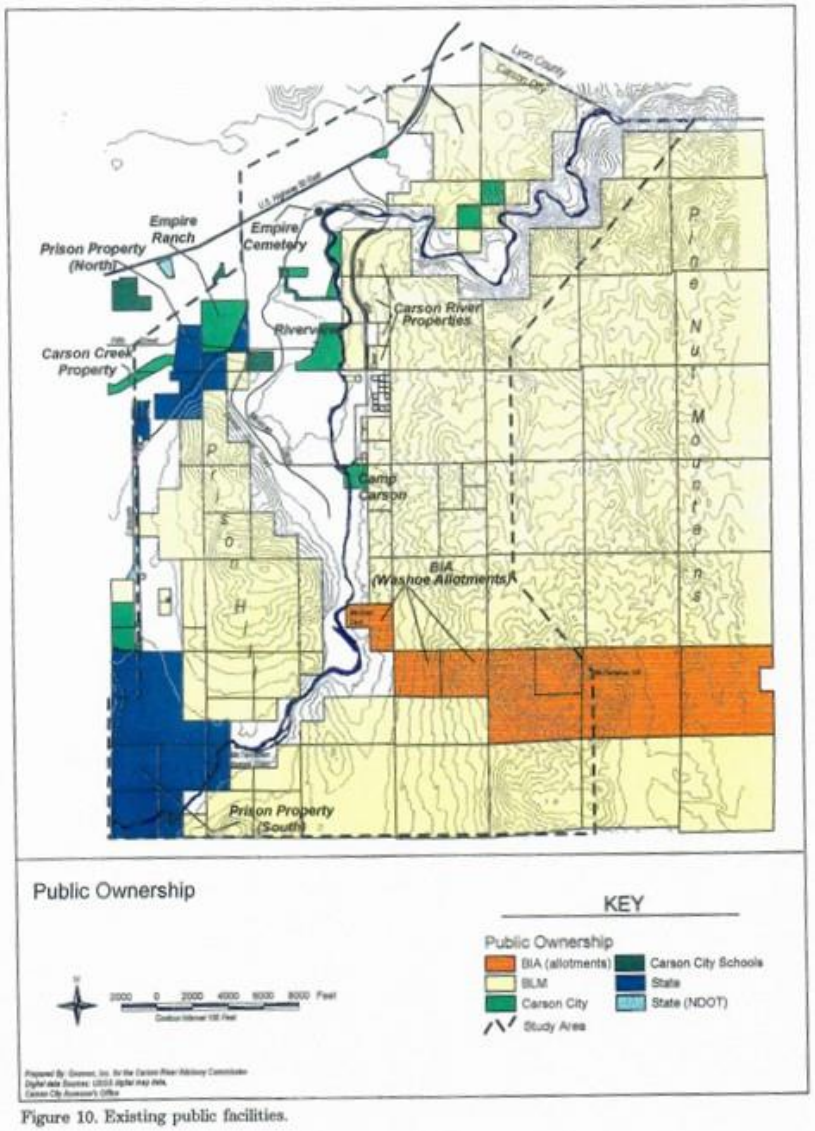


Figure 10. Existing public facilities.

Current Uses

Currently, the river area supports a variety of recreational uses including but not limited to: fishing, OHVs, mountain biking, hiking, bird watching, picnicking, camping, hunting, recreational shooting, swimming, boating, and equestrian use. Some of these uses are not considered compatible to the overall health of the river or to the public enjoyment of its resources. The Committee makes specific recommendations later in this document that address those situations.

Demand for Recreation on the River

Public Properties

A history of incompatible use has damaged natural resources in the river area. A shortage of facilities exists on public properties that support compatible recreational activities. This plan addresses the need for meeting public demand for recreation and offers solutions that support adequate protection of the river.

Private Properties

The highest recreational use by the public occurs primarily on private property along the river. This type of use needs to be directed to public properties, which will help solve the problem of non-compatible activities that are damaging the river's resources. As private properties become developed, opportunities for recreation may decrease.

If incompatible activities are curtailed through restriction or prohibition, the recreational demand should be met by proper planning. This plan addresses demand and compatible uses so that current and future needs may be met. This plan will also address the problem of private property trespass and damage to the river environment.

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Chapter 6

Planning Considerations

Master Plans

Goals and policies related to recreation and the river in the Carson City Master Plan and the Carson City Recreational Master Plan are reflected in this Committee's recommendations. This plan, specifically for the Carson River, is part of a coordinated effort to update the Carson City Master Plan.

Conservancy Area

The properties within the Carson River floodplain are designated as an example of a **Conservancy Areal** in the Carson City "Recreational Master Plan." The Committee followed this definition of **Conservancy Area** in its plan.

Conservancy Area [Defined]

Use: An area not developed or only minimally developed for varying recreational general community open space; generally, an area of natural open space or non development. The primary function is protection and management of the natural environment with recreation use as a secondary objective.

Size: Determined by function and purpose. Can range from "small" to "very large." Sufficient size to protect the resource.

Contents: The primary function is protection and management of the natural environment with recreation use as a secondary objective. Developments may include trailhead improvements, signs to provide information on use, pathways or trails appropriate for area, wildlife habitat improvements. May include facilities for recreational use such as camping, nature study, cultural resource protection and interpretation.

Population Served: Generally the entire community or regional population, but may serve a smaller portion of the community if deemed appropriate by the Parks and Recreation Commission.

Example: The Carson River floodplain, wetlands, the public lands surrounding the community administered by the US Forest Service and Bureau of Land Management and the State of Nevada.

NOTE_ 'This is not to be confused with the definition of Conservation Reserve as it applies to city zoning. Conservancy area is defined strictly for the recreational area along the Carson River.

Carson River Advisory Committee Goals

The committee goals are outlined in Chapter 1. Those goals were used as guidelines in establishing the Carson River Master Plan described herein.

Concerns from Public Workshop on the Carson River

On February 9, 1994 a public workshop was held concerning the Carson River. The comments from that workshop were part of the basic groundwork for this Committee. The Committee has made a concerted effort to address the issues raised at that meeting.

The following are some of the comments which summarize what the public felt were important points about the river. (Results of the workshop are contained in(Appendix 4.)

- Leave land alone
- Preserve natural setting
- Leave as is
- Preserve private property "as is"
- Privacy for private property owners
- Wildlife and river "as is"
- Unrestrained pets
- Acquire easements where possible
- Threat to wildlife with development
- Provide natural setting for wildlife
- We like the "undeveloped" river
- Protect wildlife habitat
- No Corridor
- Vagrant inhabitants
- Protect private property
- Lack of motorized vehicles
- City already can't maintain existing facilities
- Law enforcement in the area along the River
- Wildlife and nature left in natural state
- We need to preserve our river resource for generations to come so all may enjoy the area
- City should use funds to improve existing public areas on the River or buy lots for sale
- Private land should not be accessed against the wishes of residents or landowners
- No control of public on private property
- Limited access to private properties and public access to specific public owned areas
- Public lands do not provide a tax base
- Conservation (wise use and management) not preservation
- Different sections are good for different things
- Lack of public access for recreation
- No shooting, fires, parties, vandalism, litter, crime
- Interested in bike trails, separate walking trails and separate equestrian trails
- Natural resource/open space protection

Figure 10- Cultural Resource Sensitvity ZonesProtection of Private Property Rights

There is a general concern for the protection of private property rights along portions of the river. The concern involves zoning changes or zoning code amendments that restrict allowable uses without the concurrence of affected landowners and the condemnation, usurpation, or acquisition of private property without compensation.

Environmental/Resource Concerns

Water Quality and Health of the River

The health of Carson River and the quality of its water are affected by a number of things that take place both upstream of Carson City and within the city's limits. Historical uses have also affected the river. Among these are flood irrigation and its return waters, consumption of water through irrigation, runoff from roads and developed properties, mining, and management of lands along the river. Through Carson City the river's floodplain is largely intact and undeveloped. While it is becoming more urbanized, the river area is still largely rural. This is unusual for a community of this size. Typically, most communities develop along their rivers and stream courses. Many communities are now looking for ways to restore flood function and the natural setting of their waterways. The citizens of Carson City have a unique opportunity to take advantage of the river as a community amenity.

Mercury

One issue of foremost environmental concern is the mercury level. During the late 1800s, processing of Virginia City ores in mills located along the river resulted in mercury contamination of soils in these areas. The Carson River has been identified as a superfund project below Mexican Dam due to the high mercury concentrations in the soil along the river.

Development and Land Use

An increase in development increases water runoff from impervious surfaces such as roads and buildings which adversely affects the health of the river by causing channel widening, increased sediment loads, and the loss of pools and riffles. Increases in finer sediments, stream crossings, and engineered flood control are typical impacts to river systems from development. In terms of water quality, adverse impacts include nutrient enrichment, bacterial contamination, toxic compounds, water temperature increases, trash and increases in organic matter. Together, these changes can alter flooding, stream and river banks and courses, stream habitat and stream ecology.

Allowing the floodplain to remain intact maintains the river's ability to flood naturally depositing sediment, decreases floodwater's damaging energy, and recharges groundwater sources. This avoids costly high maintenance flood control schemes or potentially costly damage to development. Such damage is often paid for by the community through subsidized low interest loans and flood insurance. Retaining the floodplain also helps to maintain the rural and natural setting of the area.

Wetlands

Wetlands play a very important part of insuring water quality. The infiltration of water into the ground water table and replenishing the water in the water basin are necessary for proper management of water resources. Wetlands are also very important for wildlife habitat (Figure 11). Most recently the Nevada Division of Environmental Protection identified three problem aspects of the Carson River. The river has sediment, phosphorus, and temperature levels that don't meet state water quality standards for healthy streams. Samples at Mexican Ditch and at New Empire exceed the safe level for phosphorus. Higher phosphorus levels lead to algal "blooms" spreading over the water's surface, which deplete the river of oxygen and lead to the death of fragile river life. Traditional sources of phosphorus pollution include soil and river bank erosion, septic and sewers systems, livestock, urban development and resulting runoff, road building and the runoff from areas of decomposing vegetation.

Wildlife

Cattle, beaver and wild horses damage the wildlife habitat or damage the river bank. The damage done by these animals degrades water quality and the wildlife habitat. These three species should be kept out of certain areas e.g., wetlands, habitat restoration areas, and environmentally sensitive areas such as the Prison System controlled state land located in the extreme southwest area. In the latter area, there are few live cottonwoods and unusually sparse willow stands. Another wildlife species that could affect recreation along the river are rattlesnakes, which are common here. However, rattlesnakes tend to flee areas heavily traversed by man.

Man has degraded much of the wildlife habitat along the river banks and his intrusion into the riparian areas has a detrimental effect on various wildlife, especially more timid species. The damaged wildlife habitat should be restored to provide cover for fish and other wildlife. Certain public areas should have access for wildlife viewing, but some restrictions should be applied due to the nesting and wildlife offspring births in the spring.

Ranching and farming practices since the 1800s have been detrimental to fish by removing much of the river's flow. Irrigation diversion dams not only impede up and downriver migration of fish, but increase water residence times. Temperature increase and dissolved oxygen concentrations may decrease in the pooled water behind dams. Flows from irrigation water returning to the river also may be high in temperature. Water flow must increase to improve summertime water quality

for better fish survival. In order to minimize detrimental effects on fish from diversion structures, Nevada Division of Wildlife (NDOW) needs to continue to work with the Nevada Division of State Lands to control the physical character and number of diversion dams, especially those structures that are not permitted.

Mining in Nevada in the 1800s and early 1900s saw the production of many mill sites along the Carson River. With this, elemental mercury was used in the process to refine ores and there were great losses of mercury into the river. Nevada Department of Environmental Protection reported higher than normal mercury levels in the sediments in the Carson River starting at New Empire and continuing downstream. However, the water itself contained very little mercury as far down as Dayton. Downstream, just below Mexican Dam, non game fish such as carp, suckers, and dace had increased mercury concentrations in their tissues (Solberger 1995). In the Carson City area, on the other hand, rainbow trout showed low (unharmful) mercury levels in body tissues. This is attributed to their short river residence time. Trout also tended to show mercury concentrations correlating with body length and weight. In other words, the longer a fish survived in the river, the larger it grew and the higher its' mercury concentration.

Owners of land within the riparian zone should be encouraged to leave the habitat in its natural state and to restore damaged habitat. Restoration of environmentally sensitive areas as described above should provide more cover and food supply thereby increasing certain wildlife populations. Maintaining, mitigating and re establishing wetlands should naturally increase the bulrush and cattail species thereby providing additional wildlife habitat below the reservoir.

There is a health advisory by the NDOW for the consumption of fish in Lahontan Reservoir and the river below the reservoir. To ease public concern about mercury levels in Carson River fish, NDOW recommends not stocking fish types that have the potential for a long survival time in the river. Based on current biological, environmental and recreational conditions, NDOW will continue to stock both rainbow and brown trout between Mexican Dam and the old mill site (just downstream from Brunswick Bridge) in Carson City.

Overall numbers and types of wildlife in the Carson River area will probably remain at the current levels, unless major improvements are made in the general habitat, and vehicle traffic and shooting along the River are curtailed or controlled. Those major improvements would include such things as the planting of more cover, including cottonwood trees and willows along the Carson River Riparian Area. NDOW wildlife biologist Sam Stiver notes that otters occur on the Carson River except between Carson City and Lahontan Dam, a fact he attributes to the otter's sensitivity to mercury contamination.

Illegal shooting of bird species occurs frequently and is a major problem along the entire length of the Carson River. Included in illegal shooting are all of the above mentioned upland game and waterfowl, plus all other bird species that inhabit the river corridor (Buonamici, personal communication). Raptors, i.e., eagles, hawks and owls all too often are prime victims

of illegal shooting. Raptors are federally protected, but that appears to be of little concern to the miscreants that indiscriminately kill birds regardless of species. The indiscriminate shooting of all bird species appears to be the unfortunate result of individuals, that are attracted to the river for "plinking." "Plinking" shooters will shoot at just about anything: birds, mammals, trees, fence posts, tin cans, rocks, bottles, carp in the river, and so forth. With the proposed restrictions on shooting in the Carson River area, that indiscriminate shooting should be brought under control. Unfortunately, that shooting ban will also affect the serious, law abiding sport hunters.

Cultural Resources

Cultural resources are defined as significant archaeological, historical, and architectural or culturally related sites, and include physical manifestations of human activity such as encampments, roads, trails and millsites, along with less obvious areas that maintain special cultural geographic values. As defined in the Native American Graves Protection and Repatriation Act (43 CFR, Part 10; 1994), cultural geographic properties are areas or places that have special meaning to specific groups. These include traditional cultural properties, Native American religious locations, and burial grounds.

A number of cultural resources are unique to the Carson River and its surrounding environment. Thus, preservation and management are essential in order to maintain aspects of the river that distinguish it from the surrounding community, and to enhance regional character and identity. Prehistoric and historic resources contribute to recreation opportunities, community identity, aesthetic beauty, spiritual importance, and historic interest of the area. Development and management of these resources may attract numerous local and out of state visitors, contributing to the overall economy of the region.

Site files and records archived at the Nevada State Museum, Bureau of Land Management, Carson City, and Carson City Community Development were consulted in order to identify known or potential cultural resources associated with the Carson River Corridor. Previous cultural resource inventories along the river are limited due to minimal development and limited involvement of federal or state agencies that would normally require environmental impact assessments. As a result, few prehistoric resources, while likely, have been located. Figure 12 depicts cultural resource sensitivity zones, based upon known or historically documented site locations.

Abundant historic features and archaeological sites relating to the Comstock are known from the historic record. The physical extent, significance and condition of sites within the sensitivity zone have yet to be determined, but an evaluation of National Register eligibility is required as part of the Federal permitting procedure. Developers should be aware that integrity and significance of cultural resources should be evaluated prior to development.

The Washoe Tribe Comprehensive Land Use Plan (1994) identifies planning concerns and contemporary practices of the Washoe. Access to resources on public or private lands throughout Washoe territory is becoming more difficult due to destruction of resources by development and by liability concerns of private landholders.

The gathering of plant material for food, medicine and basket weaving are prevalent contemporary practices affecting land use decisions. Riparian areas, meadows and marshlands support a wide variety of important plants for contemporary gatherers including willows for basket weaving. "Good willow" for basket making is not always available in the same place yearly, so locating accessible stands can be difficult. Additionally, weavers who hold strips of willow in their mouths during preparation fear health impacts from herbicides used to control willow growth. The practice of reintroducing willow into riparian areas provides an obvious benefit for Washoe basketmakers.

Water sources, traditionally revered "as the source of our life" are still connected with Washoe spiritual practices, and pine nut harvesting is the basis of traditional food gathering and ceremonial practices. Protecting water sources and pine nut resources is a priority expressed by many Tribal members.

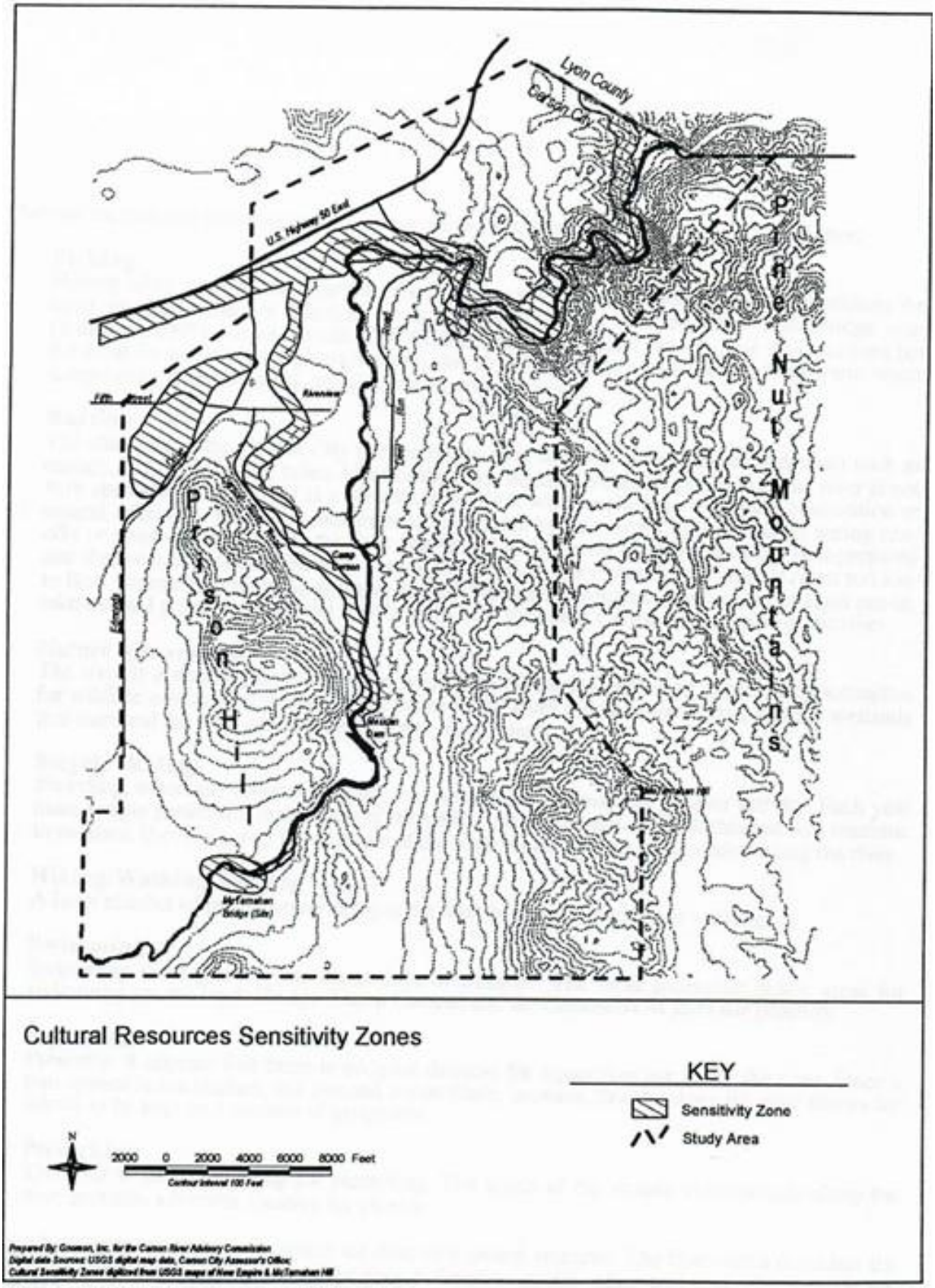

Figure 12. Cultural resource sensitivity zones.

Figure 11- Cultural Resources Sensitivity Zones

Mining

There is one active mining site on the river. This mining site is adjacent to BLM properties on the river bank.

Gravel

There is one gravel extraction site on the river. It is near the Brunswick Bridge and the owner has begun to remediate damage in the area.

Current Users/Visitors

Properties along the river are subjected to heavy use on private and public lands and have not been properly managed. The resources have historically been misused and some of the watershed has been damaged. In the past, use along the river has been minimally controlled for camping, off road vehicle use, camp fires, discharge of firearms, parties and motor vehicle use along the banks. With orientation towards enhancement and protection of natural resources, the plan may lead to conflicts with some of the current visitors who participate in incompatible use. The intent of this planning effort has been to address the spectrum of community interests and desires with regard to use of the Carson River area. While it is fair to say that some user groups have been more vocal than others, there has been no intent or desire to exclude or minimize the concerns of any group.

Compatible uses [per goals of Committee]

Fishing

Fishing takes place up and down tne river but due to river accessibility and river conditions the most popular areas are Mexican Dam to Lloyds Bridge and the Deer Run Bridge area (Solberger 1995). Nevada Division of Wildlife plants trout each year in these two locations but the trout do not last throughout the year due to adverse river conditions such as warm water temperature, high sediment, and fluctuating water flows.

Boating

The character of the Carson City portion of the river limits boating to small watercraft such as canoes, kayaks, rafts and tubes. Most of the time, boating within this portion of the river is not very spectacular. Usually it is a slow leisurely float with ample time for nature observation or mental reflection. However, this dramatically varies by year or by season. During spring run-offs or unusually wet years, the river can be too treacherous for other than the best prepared and the most experienced boaters. During dry years and dry seasons the river is often too low to float without experiencing portages longer than water stretches. The scarcity of legal put in, take out and portage areas make it difficult to float the entire Carson City portion of the river

Nature Observation

The river is a magnet for much of the wildlife in the region, affording excellent opportunities for wildlife observation. Many people come to the river for this type of use, and the wetlands that surround the river enhance this activity significantly.

Bicycle Riding

Bicycling, especially mountain biking, has become an increasingly popular activity. Each year more people participate in this type of recreation. As more trails are built this use will continue to escalate. Bicycling may become one of the most popular forms of recreation along the river.

Hiking/Walking/ Jogging

A large number of people come to enjoy the river by hiking, jogging or walking.

Swimming

Swimming takes place in the warm days of summer. The most accessible public areas for
swimming are at Lloyds Bridge (Camp Carson) and the CarsonIBLM joint use property.

Equestrian

Presently, it appears that there is no great demand for equestrian use along the river. Once a trail system is established, this demand would likely increase. Zoning along the river allows for horses to be kept on a number of properties.

Picnicking

The river is an ideal setting for picnicking. The shade of the mature cottonwoods along the river provides a favorite location for picnics.

Incompatible Uses

One of the primary goals is to protect the river as a natural resource. The Committee considers the following uses incompatible since they pose a threat to public safety and generally degrade the natural environment of the river: illegal camping, OHVs, motorized watercraft and, in some areas, hunting and shooting.

Hunting/Shooting

Development along the river, primarily in the central section, has made hunting and firearm use an issue for public safety and wildlife protection reasons. The county rifle and shotgun ranges provide an alternative to shooting along the river. Recommendations are based upon the following impacts:

- Safety of hikers, recreationalists
- Residential density incompatible with shooting

Illegal Camping

The Committee has not proposed developed campsites along the river in Carson City. Illegal camping poses a problem for the following reasons:

- Excessive litter/dumping
- Fire hazard
- Vegetation and wildlife damage
- Lack of sanitary facilities

Off Highway Vehicles (OHVs)

The protection of the environment is a primary goal of this plan, and OHV use in the immediate area of the river increases erosion and habitat destruction. The Committee does support OHV use outside the river area as addressed later in this document.

The Committee's recommendation that OHV use along the river area be restricted or limited is based on by the following potential impacts:

- Visual disfigurement of the hills
- Erosion of the hillsides increasing run off of pollutants into the river
- Vegetation and wildlife habitat damage
- Dust and air pollution
- Noise in enclosed river canyon

Motorized Watercraft

Any operation of watercraft with gas powered motors should be restricted due to the following potential impacts:

- Excessive noise
- Air pollution

Possible Developments

Historic family ranches are being purchased and further development is proposed along the Carson River. The developers will use the attraction of the river to enhance the value of the property. The enhancement will involve planning for use along the river. This will create a greater demand on the river, and will necessitate planning for compatible uses.

Public Safety

One of the primary issues has been law enforcement along the river. The Committee has made recommendations that deal directly with resolving these concerns. Commitment on the part of the public is needed to insure this proposal is carried forward to provide for the protection of the resource and safety of the visitors who use the river.

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Chapter 7

Committee Guidelines

Recommendations for any development along the Carson River

Guiding Principles

The following guidelines are established to set the foundation for this plan. These guidelines were considered before the Committee's recommendations were made. These guidelines should be incorporated and followed in the decision making process.

General Guidelines

- As its general prescription for land use in the river area, the Carson River Advisory Committee has adopted the definition of **Conservancy Area** as outlined in the Carson City Recreational Master Plan (see Chapter 6).
- The protection of private property rights, wildlife, wildlife habitat and natural and cultural resources must be addressed and weighed as a high priority in all alternatives.
- Activities along the river that cause negative impacts to natural resources and law enforcement concerns (i.e., illegal camping, fires, and shooting) should be stopped.
- Consistency in management, land acquisition and natural resource protection policies are recommended for the entire river.
- Potential impacts to sensitive natural resources should be minimized by concentrating proposed facilities in areas near, or adjacent to, existing parks or recreation areas whenever feasible.
- Activities that could have undesirable impacts on the river, wildlife, visitors or nearby residents should be monitored, and action should be taken to minimize or control negative impacts.
- The city should prepare design guidelines and standards that will maintain the rural like atmosphere of the Carson River area. The Committee makes the following recommendations that should be part of those guidelines:

    - Development should be designed to harmonize or blend with the current agricultural and rural setting.
    - Design guidelines and standards should include:
    - minimized and low intensity street lighting;
    - color schemes and architectural designs which harmonize with the local landscape, background and pastoral land use and effect;
    - primary and secondary underground power service; restrict development, including power lines, from being placed along or protruding above ridge lines.
    - Design of commercial development in the sub divisions should be thematic and harmonious with the area and be limited to the minimum convenience service

businesses for the area. They should also include landscaping and limited low intensity lighting.

- Main transportation routes should be limited and kept to two lanes, with bike lane capacity.

Private Land Issue Guidelines

Should any Title 18 zoning code amendments and/or changes for land use occur as a result of this plan, then all affected parties will be notified pursuant to and in full compliance with all local and state provisions prior to such amendments or rezoning. Existing parcels of land shall be considered as legal parcels of record pursuant to Carson City Municipal Code 18.05.076.

The Carson River Advisory Committee supports the preservation of open space (as defined in NRS 361A.010), especially agricultural lands. Goal 16 in the Carson City Recreational Master Plan also supports preservation of open space. The agricultural open space that is preferred by the Committee is properly maintained pasture, which has been a common use since initial settlement of the valley.

The committee encourages the city to be flexible and to offer tax incentives through the Open Space Tax program [NRS 361A.010], hillside ordinances amendments, or planning flexibilities such as: higher densities, building height, setbacks, lot size, or clustering to protect open space from development, as permitted in CCMC 17.69. Planned Unit Developments automatically grant a density bonus for open space.

Private land exchanges/acquisitions of parcels along the river with public land agencies is highly encouraged. The parcels exchanged for the river properties could have tax incentives or planning compromises made to help insure the exchange. Other developable lots should be identified for these exchanges. The Committee recommends the exchanges be made for the following reasons:

Protection of wildlife
Wetland restoration
Access
Scenic
Restrict development
Protection of cultural resources
Flood Zone protection

Property owners should be given tax breaks for any property dedicated to protect wildlife habitat or for the establishment of any recreational trail. A formula can be developed to allow for these considerations.

Non recreational business along the river area is emphatically discouraged.

All public recreational development should be at least 150 feet from private property, whenever possible, with the planting of native vegetation whenever possible for screening.

Also, all development will be designed with the utmost respect for, and minimum disturbance to, private property. This should lead to a reduction of, or elimination of, trespass on private property.

Individual Property Owners

The width of the river channel, floodplain and riparian area vary from one location to the next (Figure 13), hence, development[2] setbacks should vary accordingly. A minimum recommended development setback of 50 feet from the mean high water mark should allow some low intensity development in areas where the channel, floodplain and riparian area are situated in a narrow zone, while still protecting habitat and wildlife corridors. To prevent encroachment upon wildlife in areas of wider channels, floodplain and riparian zones, other developments could require greater setbacks. Developments warranting additional setbacks include intensive versus passive recreation, high density versus low density housing, and certain industrial and agricultural uses.

Individual land owners who participate in this plan for recreational activities need to be informed of NRS 41.510 that provides that an owner, lessee, or occupant of premises owes no duty to keep the premises safe for entry or use by anyone using his land in a recreational capacity.

Parcel Map Process/Subdivision—Planning Unit Development Process

A 300 foot buffer from the mean high water mark is recommended, and it is recommended that the city work with the developer to minimize any diminishment of property use that might result from the creation of such a buffer. Again the Committee wishes to encourage the possibility of planning compromise or tax break incentives to insure this buffer for open space. The Planned Unit Development process allows for these compromises. (Exceptions to this rule are lot size, topography or location that would make this buffer recommendation impractical).

Other development proposals along the river, recreational or other, need to address the guidelines and recommendations of the Committee in this document.

Recreational Development/Management Guidelines

- Within the recreation areas, activities should be located to minimize impacts on the river environment. High activity recreation uses and related facilities will be located as far from the river as possible. Wetlands and native vegetation should be used to further isolate intensive uses from the river. In general, only those uses that are river dependent such as fishing, boating, swimming, and nature observation will be located on the river. Picnic areas, trails, roads, trailhead parking, and restrooms should all be sited away from environmentally sensitive areas.

Development (definition): Any construction that requires a building permit, excluding outdoor recreational facilities (NOTE: This recommended setback is not intended as a public access easement).

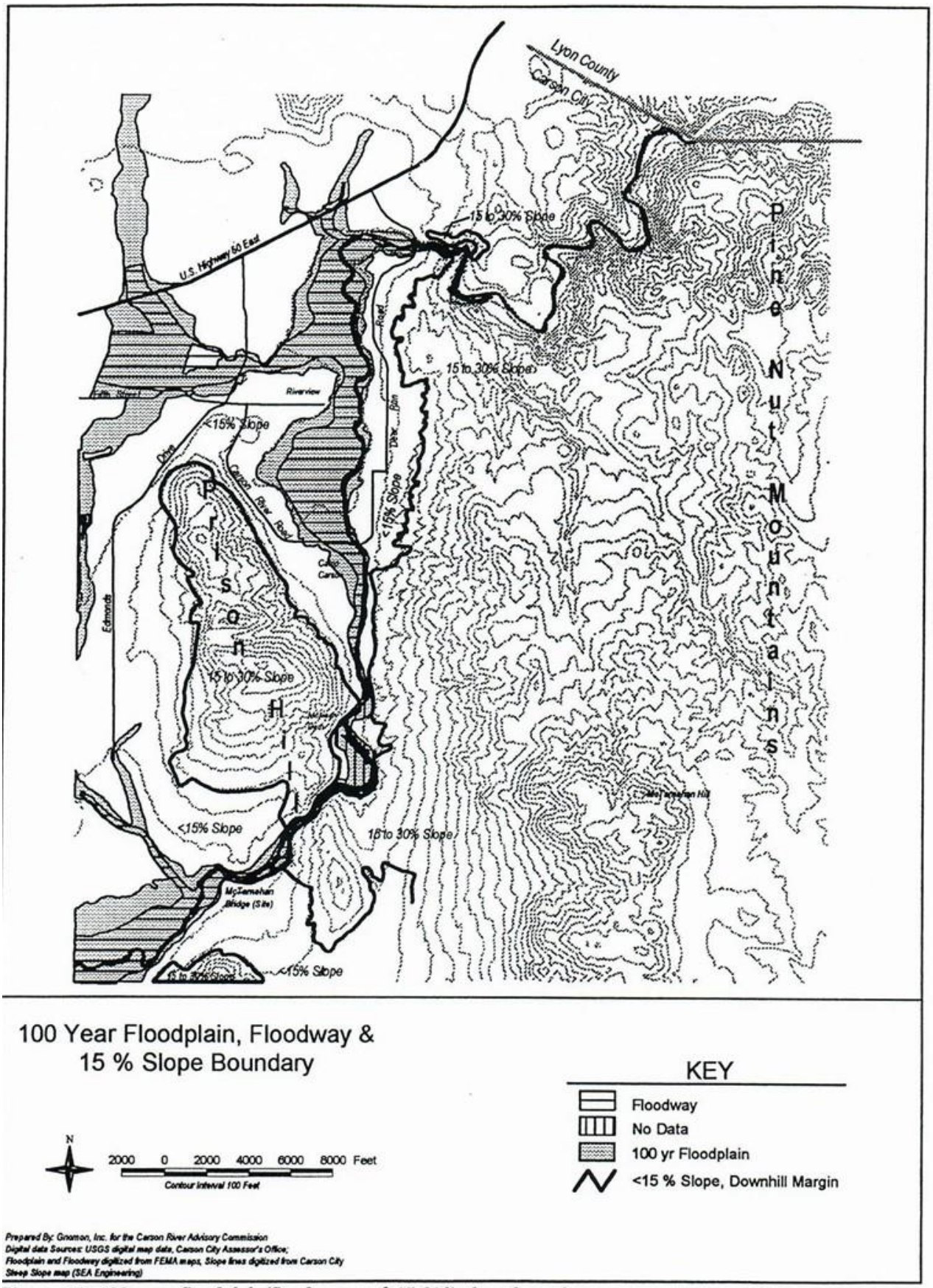

Figure 13. 100 year floodplain/floodway and 15-30% slope boundary.

Figure 12 Foodplain, Floodway & 15 % Slope Boundary

- ❖
- ❖ Passive recreation activities should be the primary use of the river area. These include, but are not limited to watercraft, nature observation, fishing, picnicking, hiking, biking, walking, equestrian and swimming. Therefore, the recommended improvements along the river will support passive recreation developments which include, but are not limited to trailheads, day use areas, and trails.
- ❖ Public facilities should be built with adequate budgets to support their operation, management, and maintenance. Furthermore, existing facilities should be repaired and brought up to standard operation.
- ❖ The identification and protection of historic, archaeological and architectural resources is a requirement for any project requiring federal permits, funding, or loans, and Nevada Department of Environmental Protection permits pursuant to Section 106 of the National Historic Preservation ACT (36CFR part 800). In addition, projects involving sites listed on the National Register of Historic Places, or eligible for nomination to the National Register, must be reviewed by the Carson City Historic Architectural Review Commission (NRS 384, CCMC 18.07).
- ❖ Any new properties obtained or currently owned by the city or other public agency along the river should be managed as open space (NRS 361A.010). A resource plan should be written for each newly acquired parcel and the guidelines of this Committee should be followed. Again, agricultural use is a high priority for the Committee.
- ❖ Effective/timely law enforcement within the river area should be a high priority.
- ❖ Partnerships between local, state, and federal agencies and private enterprises should be encouraged for the management of the recreational areas.
- ❖ No development, except trails, should be allowed in sensitive areas, i.e., wetlands, floodway, or riparian areas, unless development fully complies with CCMC 12.09 and 18.11.
- ❖ Where it is possible and feasible to do so, access to public facilities, trailheads and day use areas should be in accordance with standards set forth in the Americans with Disabilities Act. Federal and state grants to enable this type of construction should be pursued and supported by Carson City.

General Recommendations

1. Coordinated Resource Management Plan (CRMP)

The City should initiate or reactivate a Coordinated Resource Management Plan (CRMP) process for the Carson River area. Every effort should be made to include private property owners in the process from its inception. A CRMP process is, in simplest terms, one in which all stakeholders work together to create an agreement about how each will manage lands

within their control to accomplish a common natural resource goal. As an example, a storm water management plan would be part of the city's contribution to improving the health and vitality of the Carson River. A CRMP process is an effective tool for putting all stakeholders on a level playing field. It is a consensus process and probably is the best method available for Carson City to achieve positive long term natural resource management for the Carson River.

2. Vehicular Recommendations

- Heavy truck traffic, with the exception of local pick up and delivery, should be prohibited along any developed and maintained roadways, i.e., Deer Run Road or Carson River Road, proposed for incorporation into the trail plan.
- Public vehicular traffic should not be allowed along the river except on established and maintained roadways.
- All vehicular traffic in the floodplain or in undeveloped areas adjacent to the river should be restricted (CCMC 12.09).
- The area bounded by the eastern bank of the river and the western edge of the power line road, from the Deer Run Bridge to the Douglas County line, excluding Hot Springs Mountain, should be "closed" to OHV use as shown in Figure 14. The area along the west side of the river should also be "closed" to OHV use, except for the southern part of Prison Hill which has been designated "open" as defined below (Figure 14).
    - "Closed" is defined as not allowing any OHV use. This does not include vehicles that are registered and traveling on maintained roadways.
    - The area from the power line east to the first ridgeline of the Pine Nut Mountains is recommended to be "limited."
    - "Limited" is defined as restricting OHVs to established roadways.
    - The area from the first ridgeline of the Pine Nut Mountains eastward is recommended to be "open." The southern part of Prison Hill, as shown on Figure 14, has been designated "open" to OHV use.
    - "Open" is defined as no restrictions for OHV use in this area.

3. Recreational

A. Trailhead Recommendations:

Trailheads providing public access to the river and public lands should be established in specific areas that would minimize the impact to the wildlife habitat and natural resources.

Each river trailhead should have at a minimum:

- Law Enforcement/Periodic Patrol
- Restrooms (summer months at least)
- Phone
- Informational sign, including emergency phone numbers and rules/regulations

- ❖ Each OHV trailhead should have at a minimum:
- ❖ Law Enforcement/Periodic Patrol
- ❖ Informational sign, including emergency phone numbers and rules/regulations

If budgets allow, then the following are also recommended:

- Potable water
- Paving dust control
- Interpretive signage
- Equestrian needs, if possible
- Hitching posts
- Drive through trailer parking
- Watering troughs

Each parking area should be designed to minimize off road travel from the parking area.

The trailheads should be designed to accommodate the users for that area, i.e. equestrian, hikers, fisherman, watercraft or bikes.

B. Trail Recommendations:

The Committee supports the trail design guideline recommended in the Eagle Valley Trail System report prepared by 2M Associates, Berkeley, California, for Carson City Parks and Recreation Department.

The multipurpose trail design (Figure 15) is recommended for the **CENTRAL** part of the river and the low impact single track (Figure 16) trail design for the other sections of the river. An exception would be the trails along the river within the boundaries of BLM properties, which would be single track where they are not part of a loop trail system. If future use increases in the **SOUTHERN** or **NORTHERN** section of the river, then the multipurpose design may be revised for those areas. There may be some areas where width is insufficient to construct the entire trail as outlined above. Asphalt paving should be considered for those segments of the multipurpose trail that are subject to heavy use. Proper signs and enforcement as outlined above should be part of this design.

Trails connecting public lands should be established with a concerted effort to minimize impact on adjacent private parcels.

Trails should be designed to allow several options for users to utilize sections of the river or surrounding areas.

Trails should be designed to minimize damage to the resources. When designing trails, areas already impacted should be used whenever possible to minimize additional impact.

Where there is public property on both sides of the river, a trail should be established adjacent to the river on one side only to minimize impacts on wildlife and wildlife habitat.

Trails should be designed to accommodate the different types of users, i.e., mountain bikes, equestrian, hikers/walkers, etc.

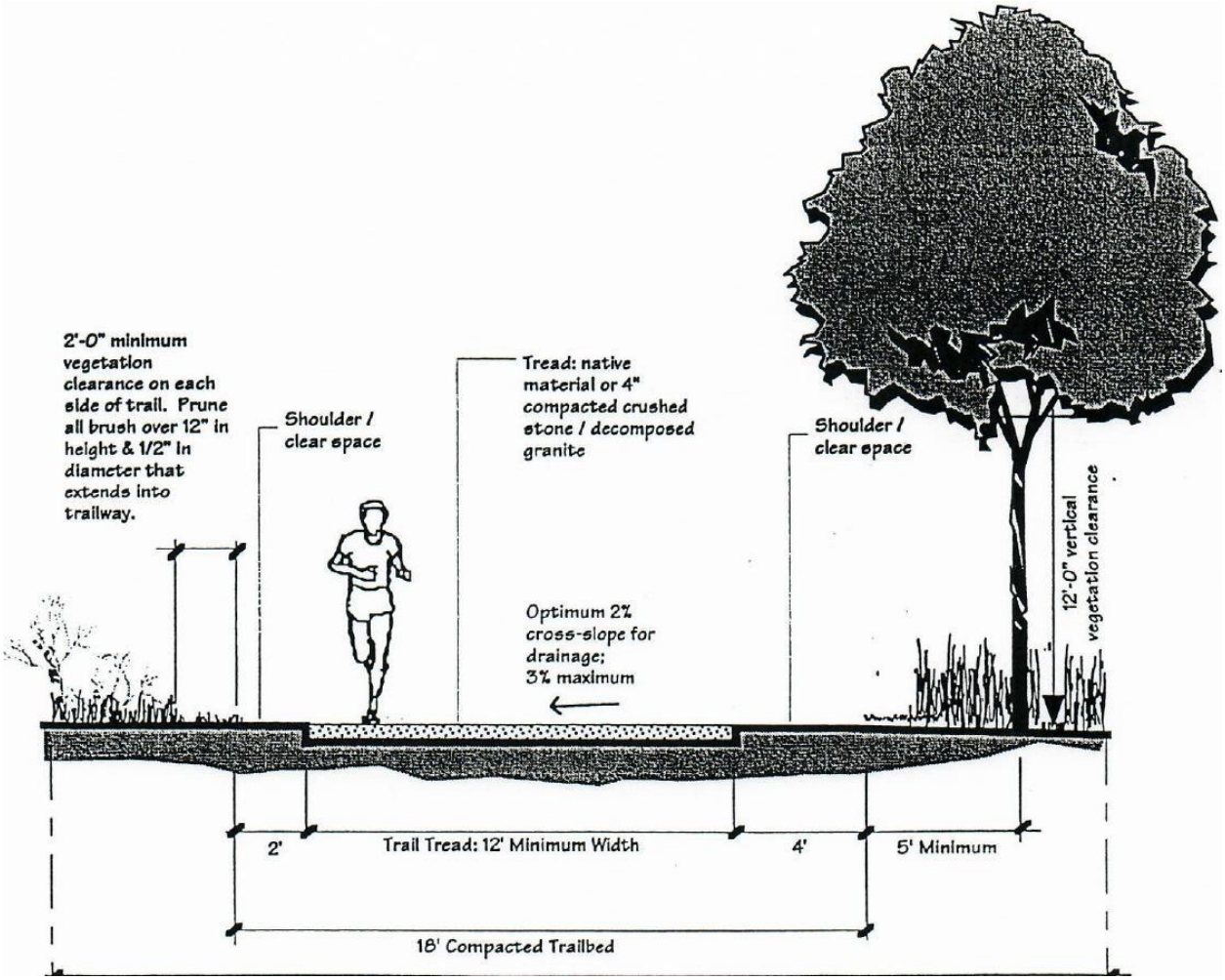

Figure 13- Trail Spec for Multi Use

Notes:

5% maximum grade

AASHTO Task Force on Geometric Design for details about horizontal alignment, sight distances, signing and marking, drainage, intersections, and grade separation structures.

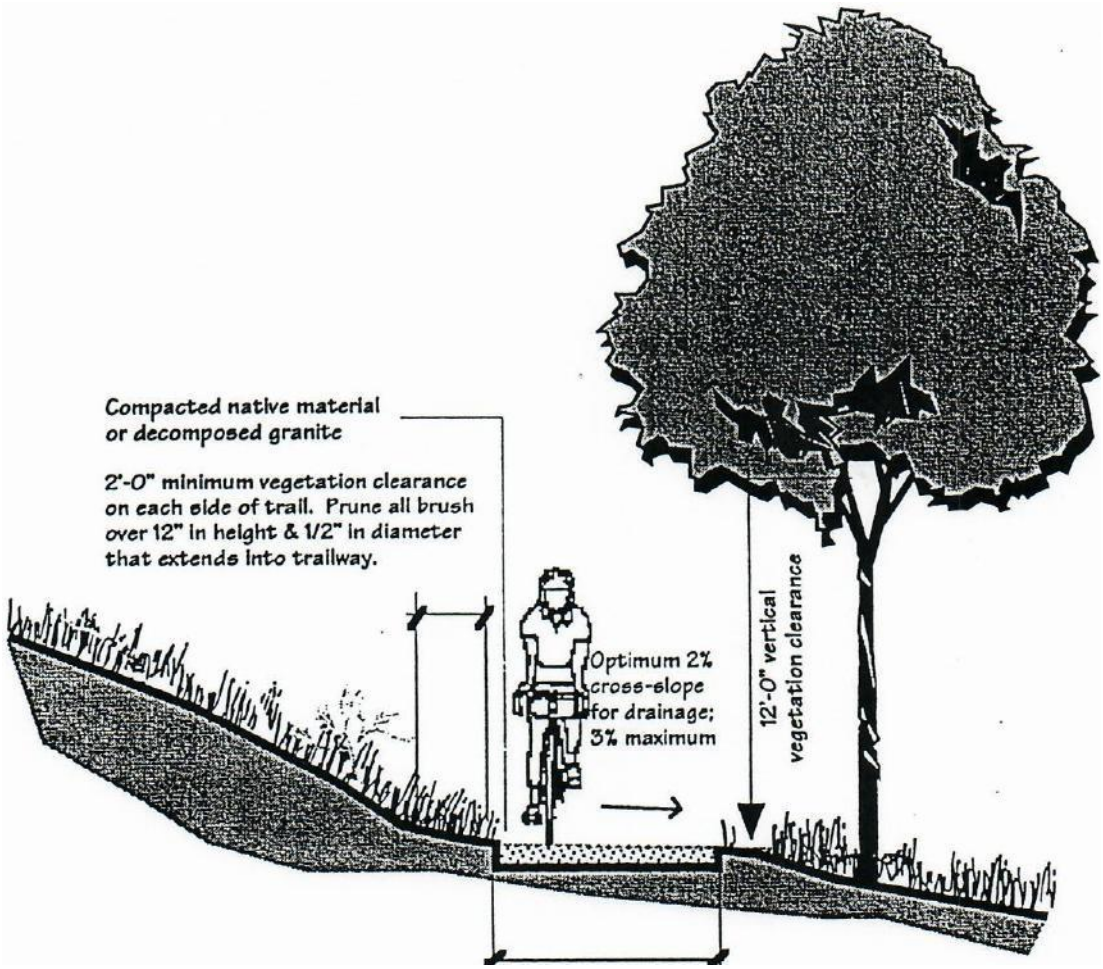

Figure 14- SIngle Track Trails

	Easy	Moderate to Pifficult	Primitive
Tread *Width:*	*0 0"*	5' 0"	4 ' 0"
Sustained Running Slope (Maximum):	57.	8.370	12.57.
Maximum Grade Allowed:	8.3%	107.	157e
for a maximum distance of:		50'	not applicable

For the protection of wildlife, it is recommended that a 150 foot buffer zone be established. This buffer zone would be measured from the mean high water mark. Trail design specifications in Figures 15 and 16 show a range of 8 to 35 feet of right of way. The trail centerline will correspond with the exterior 150 foot recommended setback buffer zone boundary. This is to be used as a guideline, acknowledging that there will be conditions such as

topography, vegetation density, cultural sites, private land holdings, wetlands, and so forth that would not allow the full 150 foot buffer from the river.

Trails may be acceptable in wetlands or sensitive areas if used for passive activities, e.g., nature study and interpretation.

To enhance the trail experience for visitors, bicycle trails need to be designed in short loops of 5 10 miles for children/families use and greater than 10 miles for recreational use. Hiking trails need to be designed in short loops of 2 3 miles for children/families and 3 10 miles for recreational use.

Trails adjacent to private property should have natural visual barriers or screening.

C. Camping Recommendations:

No unauthorized camping or overnight use should be allowed along the river, on Prison Hill, or within the interface of public and private property.

4. Water Quality and General Health of River

To protect the Carson River, restore it, and keep it healthy, it is important to develop a strategy and plan that can minimize the impacts of urban growth. Such a strategy needs to include management of storm water, assessment of problem areas, management of natural resources along the river, and the establishment of management objectives. As part of that plan the Committee recommends the following:

Any development in the 100 year floodplain that requires filling should be strongly discouraged or prohibited (Figure 17). In circumstances where development, because of design constraints of the land, may impinge upon the edge of the 100 year floodplain, exception to filling may be allowed provided that 1) the encroachment is minimized and restricted to the edge of the floodplain; 2) the encroachment is necessary as part of the site development outside of the floodplain; 3) the encroachment will not adversely alter the force of flood waters; and 4) as a result of development design and construction, there will be a no net loss of floodplain.

Septic systems and/or tanks should be discouraged in the 100 year floodplain.

Fences should not obstruct flood flows and should be designed to avoid collecting flood debris. No fence should exist, be placed, or be constructed below the high water mark.

As mentioned in the Private Land Guidelines, the exclusion of development which requires filling of the 100 year floodplain can be accomplished through consideration of density transfer, cluster development out of the floodplain, land acquisition through purchase or land trades, etc.

Any development project should be evaluated for storm water impacts to the river and appropriate Best Management Practices (BMPs) should be required, including storm water retention and treatment, and erosion or sediment control. A design storm event should be established which considers the type of storm event most likely to affect the river. The development of storm water BMPs should be made within the context of a city wide storm water management plan. Storm water management and thoughtful design are the best solutions for development impacts.

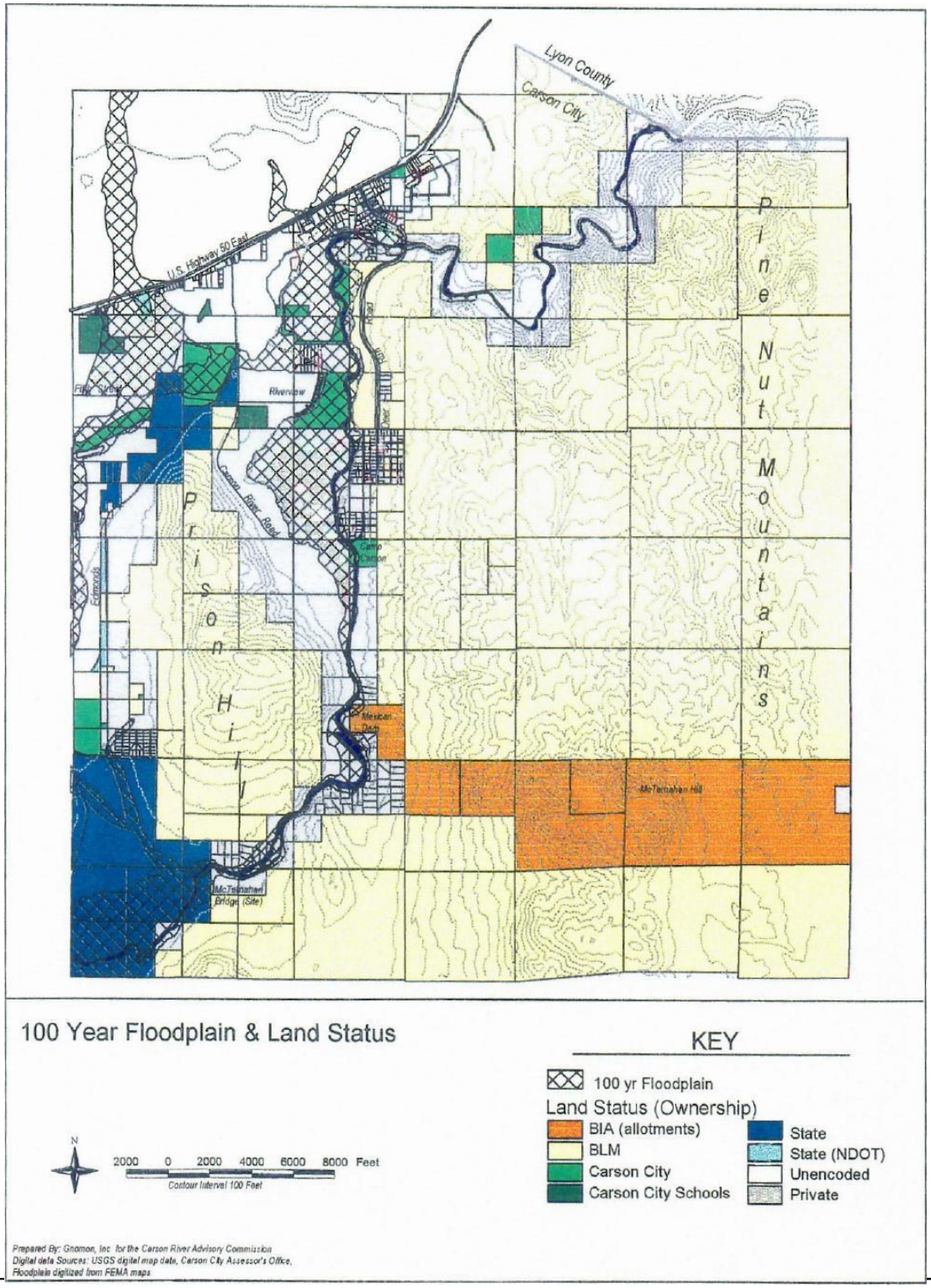

Figure 15- Flood Plain and Status

5. Wildlife Protection

- Because of nesting and wildlife births in the spring, the public should be encouraged to avoid the Carson River prime habitat areas from April 15th to June 30th.
- Pets should be kept on a leash on public lands at all times. Riparian zones must be protected per CCMC 12.09 and 18.11.
- On public property or for those requiring development/parcel review, a buffer of 300 feet from the river bank should be required to protect the wildlife corridor. Trails, if possible, need to provide a minimum buffer of 150 feet. This buffer will vary according to terrain and the extent of the land adjoining the corridor is determined to be suitable for wildlife. (See trail recommendations for further details.)
- Cattle should be fenced out of riparian areas and wild horses should be fenced out of the environmentally sensitive areas. This recommendation does not imply that wild horses will be kept entirely away from the river, only from certain environmentally fragile areas.
- Due to beaver damage in the environmentally sensitive areas, existing trees should be wrapped with chicken wire, and new willow and cottonwood growth should be established.
- An annual county wide volunteer program of wrapping trees with chicken wire should be established to protect mature trees from beaver damage.
- A beaver control program should be established.
- Owners of riparian land should be highly encouraged not to cut down willow and cottonwood trees.
- Wetlands mitigation and restoration, e.g., the imposed restoration project in Riverview Park, should be supported.
- Greater "in stream" flows should be created by supporting upstream water rights purchases that currently are being studied to provide more water for the Stillwater Wildlife Area.
- Damaged cottonwood, willow stands and river banks should be restored.
- Illegal diversion dams must be removed.
- Potential pollutants introduced into the river should be monitored and controlled.
- OHVs should be restricted from any riparian areas and from close proximity drainages.
- Some areas along the river should be closed to discharge of firearms or weapons including hunting, in accordance with Carson City Municipal Code. The areas of most concern are from the McTarnahan Bridge site to Deer Run Road Bridge.

6. Signs

Signs along the River should be standardized to meet CCMC title 15 requirements. This includes a standard recreational symbol sign at each site, and the use of materials that will not detract from the environmental setting of the River.

7. Interpretation

Environmental education nature study areas should be identified and established in cooperation with the Carson City School District. The areas should be properly developed and equipped. Pilot

programs in Lyon and Douglas County high schools where students monitor the river and its associated resources should be arranged and expanded.

An interpretive plan should be developed for the Carson River.

Any historic structures obtained through any land acquisition or parcel development should be considered for supporting interpretative elements of the area.

8. Fishing

The Nevada Division of Wildlife program to enhance the fishery in the river should be supported.

Fisherman access points need to be established in the areas designated for fishing by NDOW. This can include handicap access as well.

Habitat restoration and water quality improvement to further enhance and expand the Carson River fisheries should be supported.

9. Boating

As mentioned in Chapter 6 power boating is not recommended.

Boating regulations, safety requirements and interpretive information on low impact recreation near wildlife habitats should be at waterway trailheads.

Put in, take out and legal portage areas need to be established as follows:

Boat put in areas need to be established on the northwestern river bank near the western or eastern boundary of the state land controlled by the State Prison System. Two possibilities exist:

1. A gated power line access road extends to the river along the western boundary of Carson City and state land.
2. Along the eastern boundary of state land, the Snyder Avenue extension is adjacent to the river bank. Near the McTarnahan Bridge site is an area recommended for a river crossing trail.

A public portion of the Snyder Avenue extension goes to the USGS gaging station located just east of BLM land extending into the river. Access problems exist (e.g., the gaging station land is private, there is no turn around at the gaging station, and the BLM portion of Snyder Avenue is on a steep bank well above the river. Nevertheless, because the Mexican Dam obstacle is just downstream, a take out point should be considered for this area.

Portage rights need to be obtained from the landowners of the western or eastern side of Mexican Dam. The eastern side portage is physically superior and could afford access for garbage facilities.

For safety and liability reasons portage rights should be obtained on the western or eastern shore of the rock dam located just below Camp Carson and the Carson River Road Bridge.

Put in and take out areas should be established at the Deer Run and Brunswick Canyon Bridges.

10. Mining/Gravel Extraction

Gravel extraction should be restricted from the area along the river and should include gravel pits.

The Committee recommends that BLM designate the area along the river for withdrawal from mineral entry.

Performance standards for extraction need to be developed jointly by the Carson River

Advisory Committee and Carson City. These guidelines should address but not be limited

to**:** **Provision of CCMC 18.05.040**

- Natural drainage and erosion control
- Re vegetation/restoration efforts
- Transportation routes
- Security
- Public health, safety, and welfare

And their impact on:
Water quality Wildlife Buffer zones along the river
Surrounding land use including residential
Viewscape from the river and city

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Chapter 8

Recommended Uses by Management Area

Management Areas

The River properties have been divided into the following descriptions for simplification in making recommendations:

Public Properties

City Properties

State Properties

Federal Properties

Bureau of Land Management

Bureau of Indian Affairs

Private Properties

Individual Lots

Proposed Development Parcels

V &T Railroad

Agricultural

Undeveloped Private Parcels

Commercial

The river, as mentioned in Chapter 2, is divided into three areas.

SOUTHERN

This section of the river has the greatest potential for an area that can be left natural and undisturbed. It has very minimal use since the State Prison System does not allow trespass. Better management of the riparian area along the river, wildlife and wildlife habitat restoration and an unintrusive single track trail are proposed. The river flows slowly through this fairly level area, with the characteristics of a mature river with meandering oxbows. The area provides an excellent opportunity for nature study. This area should be inventoried for historic and prehistoric cultural resources and evaluated for National Register eligibility and interpretation potential.

CENTRAL

The highest frequency of residential development occurs within this section of the river, and it is heavily used by the public. Recreational development is proposed for this section. There also are several excellent opportunities to accommodate daily visitors and still protect the river, its habitat, and privacy of property owners. The river flows slowly through this area and only has one main portage point at Mexican Dam. This area will have the most concentrated use due to its location, allowing other sections of the river to be exposed to less impact. Cultural resource inventories will most likely be conducted as part of the large parcel development/Corps of Engineer/federal permit requirements.

NORTHERN

This area is primarily owned by private parties, but the likelihood of further development is minimal except for the V&T Railroad. If the V&T is constructed, this area will assume a much different character. Adjacent to the river, properties are private but ownership immediately outside of these parcels is public. Because of the steep canyon walls, recreation opportunities are limited to those associated with trails, fishing or whitewater recreation for experienced boaters. Most of the Comstock mill sites are located along this portion of the river. These sites need to be inventoried and evaluated for National Register eligibility and interpretive potential. This area also has the only commercial business along the river. There is recreational potential for this area if land exchanges with public entities can be accomplished.

Specific Recommendations

A general plan was drawn up to show recommended recreational development along the river (Table 1) which includes trailheads and trails as shown in Figure 18.

Public Properties

City Properties

Camp Carson [Central]

- Carson City Parks and Recreation should revisit the existing 1974 Master Plan and review the development plan for the park. The plans do not follow the requirements of development in a Conservancy Area or this plan.

- Vehicular traffic off the roadways along the river and in the borrow pit on the eastern side should be restricted.
- Vehicular traffic along the river on the western bank should be restricted by stopping traffic at the pavement edge.
- The damage done by OHVs in the borrow pit and along the river should be repaired.
- The borrow pit may be used as a snowplay area.
- This park should be connected to the linear park near Edmonds.
- As recommended in the guidelines in Chapter 7, the existing facilities need to be brought up to operating condition.
- Trailheads should be established.
- Interpretive areas should be established.

Table 1. Recommended Uses for Properties Along the River.

RECOMMENDED USES

E- Existing
R - Recommended

	PICNICKING	SWIMMING	BOATING	FISHING	TRAILHEAD	TRAILS	ENVIRONMENTAL EDUCATION	INTERPRETIVE
City Owned [All Central Section]								
Camp Carson	E	E	E	E	E	R		R
Riverview	E	E		E	E	E	R	R
Carson Creek [right of way]						R		R
Mexican Ditch [city owned]						R		R
Linear Park [not along river]						R		
Empire Ranch [western side]						R		R
Empire Ranch [eastern side]				R	R	R	R	R
Empire Cemetery								R
State Properties								
Prison properties [Southern]						R	R	R
Prison Properties [Northern]					R	E		
Federal Properties								
Carson/BLM joint use park	R	R	R	R	R	R	R	R
Pine Nut Mountains					R			
Prison Hills Recreation Area					E	E		R
BIA properties [Washoe Allotments]								R
Private Land Owners								
Individual lot owners [Central]						R		
Sub Division/Develop [Central]					R	R		R
V&T Railroad proposal					R	R		R
Agricultural use property						R		

Figure 16- Recommended Uses

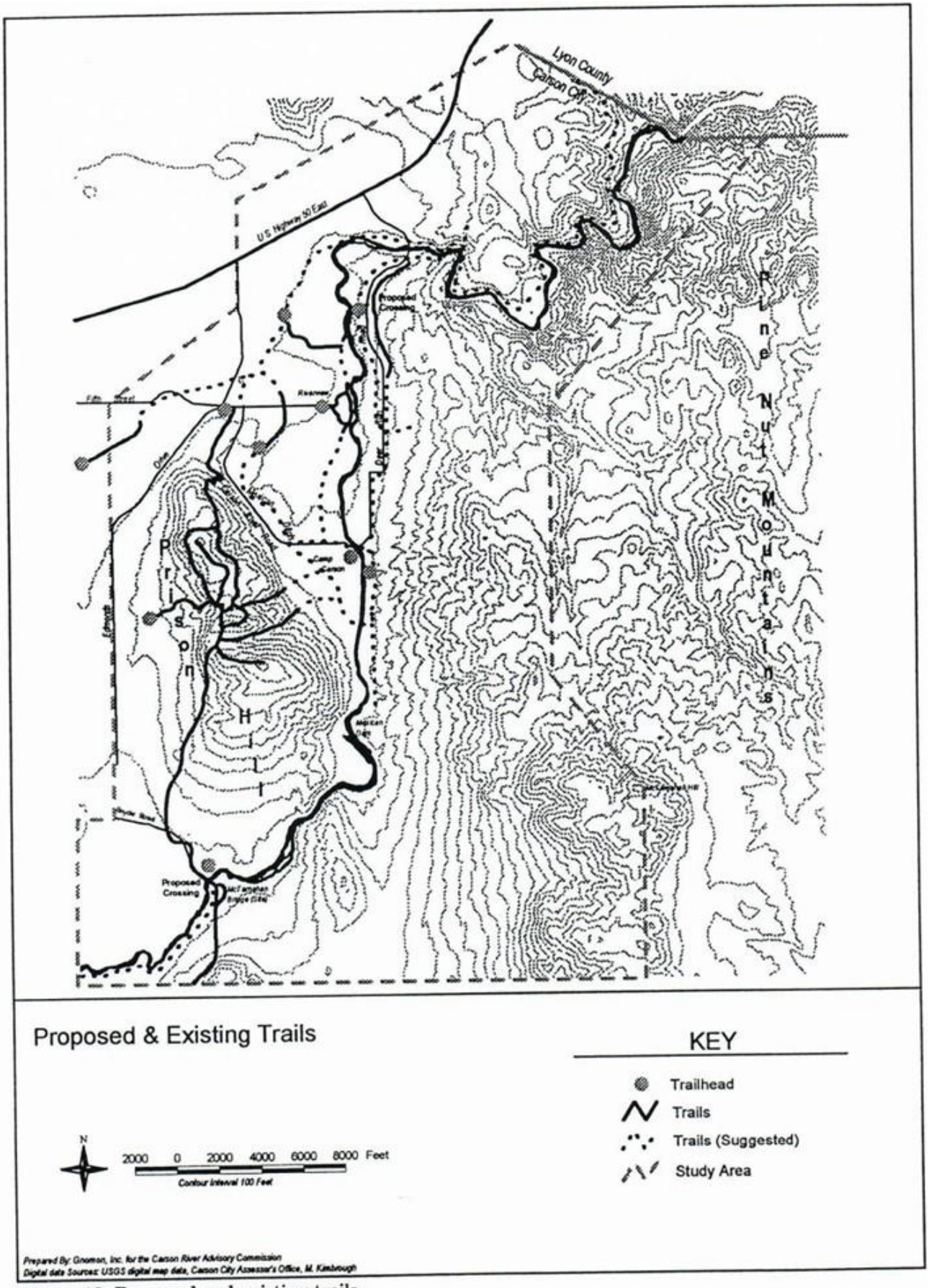

Figure 18. Proposed and existing trails.

Figure 17 - Proposed and Existing Trails

Riverview Park [CENTRAL]

Parks and Recreation should review its trail construction specifications and follow guidelines established in the Eagle Valley Trail System Report.

Wetlands should be interpreted and the trail should incorporate the wetlands interpretation.

Carson Creek & Mexican Ditch Linear Park

- Easements and properties should be obtained to allow the connection of trails as proposed in this plan. An inventory and evaluation of Mexican Ditch for National Register eligibility and interpretive potential should be conducted.
- Interpretive areas should be provided.

Linear Corridor Park

An effort should be made to finish the Corridor Park from the Sierra to the river. Of primary concern is the section from Hwy 395 to the river.

Deer Run Road to Lloyds Bridge Roadway

These roadways have been designated as part of the trails and the primary concern would be for equestrian users along the roadways. Bicyclists and hikers can use the low traffic roadway until a better trail is established along the roadway. A single track parallel with the roadway might be an alternative if a bike lane were established.

Empire Cemetery

Maintenance should preserve the state of arrested disrepair, and the area should be monitored to insure limited encroachment by surrounding commercial activity.

State Properties

Prison Properties [SOUTHERN]

- A river crossing for hiking/biking or equestrians at McTarnahan Bridge should be established.
- Boating access area along the western or eastern boundary of this property should be established.
- In the review of this document by concerned agencies, the Committee was informed by Warden Burns that public use along the river would not be supported. Nevertheless, this committee recommends that the city negotiate with the State of Nevada to obtain a right away on and across state property near the McTarnahan Bridge site (Nevada State Prison Land) for the purpose of providing public access to areas south and east of the river. This area is the least disturbed along the Carson City portion of the river, although the wildlife habitat

is in need of restoration. Again, the trail should be only along the southeastern side. This area should be left as undisturbed as possible.

- Cattle and wild horses should be excluded from the river banks and extensive habitat and wildlife restoration work should be done.
- This area would be an ideal nature observation area for scientific river studies, and partnership with WNCC or other educational institution should be pursued.

Prison Properties [Northern Prison Hills Property]

Prior authorization should be acquired to construct a trail on prison property.

River Bottom

If necessary, supports for bridges should be allowed for crossing the river

Federal Properties

Bureau of Land Management

- Carson/BLM Joint Use Park [Central]
- A river crossing for hiking/biking or equestrian use should be established.
- Overnight use should be discontinued.
- OHV use should be discontinued.
- A trailhead should be established as set forth in the trailhead recommendations.
- Old roadways in the floodplains should be closed and restored to a natural landscape.
- BLM needs to withdraw the area from mineral entry.
- An interpretive/environmental education area should be established.

Pine Nut Mountains

- See (Appendix 2**)** for letter sent to BLM outlining the Committee's recommendations for management of OHVs and recreation in this area.
- A trailhead should be established on Sedgevi' ay for OHVs.

Virginia Range

A connector trail to the Pine Nut Mountains should be designed and built.

Prison Hills Recreation Area

- Trails for hiking/biking/equestrians that can be used to get through the OHV area from Hot Spring Mountain to Prison Hill and over to 5th Street should be constructed.
- There should be non motorized access from Camp Carson to Prison Hill.
- The Committee supports the existing OHV use but does not recommend any expansion.
- Proper signage, with interpretation of area included as part of that plan, should be installed.
- A trailhead north of the McTarnahan Bridge site, within the existing OHV area, that will accommodate all the recreational needs of the area, should be established.
- A river crossing near the McTarnahan Bridge[3] site which will provide recreational access to public lands south and east of the river into Douglas County should be established.

  Note Since access to and from the McTarnahan Bridge site is on privately owned property. If the actual McTarnahan Bridge site is reconstructed or used in any way, specific agreements and approval would need to be obtained from subject property owner(s).

Bureau of Indian Affairs

BIA Washoe Tribe Allotments

- Signs and barriers to stop OHV use along the river and adjacent hillside should be placed.
- Partnership with the Washoe Tribe to restore the area to natural conditions, to the extent
- possible, should be developed.
- An inventory and evaluation for National Register eligibility and interpretive potential should be conducted.
- Interpretive area should be established.

Private Properties

Private Land Owners

All private land owner recommendations:

- Property owners should be encouraged to preserve the scenic, natural and cultural resources, and wildlife habitat values when establishing any structure, storage or disturbance of any kind adjacent to the river.
- Property owners are to adhere to Carson City Municipal Code specifically defined in 8.08.150 (Public Nuisance ordinance)
- Owners of riparian area lands should be encouraged to leave habitat in its natural state and restore damaged habitat; furthermore, a program should be initiated to encourage landowners to re establish cottonwood and willow stands on river banks and in riparian areas.

Subdivision/development owner up for parcel review recommendations:

- Existing agricultural lands should be preserved.
- In the **NORTHERN** section of the river, public land exchanges should be encouraged with the owners.
- Where appropriate, interpretive areas should be established.

V&T Railroad properties

- At such time the V&T Railroad is re established, it is recommended that a trail be designed to allow public access.
- Where appropriate, interpretive areas should be established.

Agricultural use property recommendations:

Cattle should be limited from riparian areas for protection of wildlife habitat and riverbank stabilization.

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Appendix 1

Carson City BOS Resolution Formally Establishing The Carson River Advisory Committee

RESOLUTION NO: 1993-R-52

A RESOLUTION FORMALLY ESTABLISHING THE CARSON RIVER ADVISORY COMMITTEE

WHEREAS, the Carson City Board of Supervisors desires impartial recommendations from qualified persons regarding the Carson River in Carson City, Nevada; and

WHEREAS, Section 2.320 of the Carson City Charter allows the board to create advisory boards to advise the board in specific areas of local government; and

WHEREAS, the Board desires to create an advisory board to make suggestions to the Board of Supervisors regarding the Carson River Corridor; and

WHEREAS, the board desires to set forth guidelines regarding membership of the committee, purpose of the committee, length of term of the members of the committee, frequency of meetings, and other related matters.

NOW, THEREFORE, the Board hereby resolves as follows:

1. The Carson River Advisory Committee is hereby formally established consisting of nine (9) members appointed by the Board of Supervisors.

2. The Carson River Advisory Committee shall be composed of:

a. Four (4) owners of property along Carson River:

One (1) owner of 20+ acres; and

Three (3) owners of less than 20 acres, representing various geographic areas along the Carson River;

b. One (1) Citizen-at-large;

c. One (1) person representing wild life issues;

d. One (1) person representing environmental/planning issues;

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e. One (1) person representing historic/cultural/V&T/issues/native americans; and

f. One (1) person representing recreation issues.

3. The purpose of the Carson River Advisory Committee shall be to provide the Board of Supervisors with advice on matters concerning the Carson City master plan update as it pertains to uses of the Carson River, the coordination and implementation of various enhancement projects along the Carson River and the promotion of education and public awareness of the vital resources of the Carson River.

4. The members of the Carson River Advisory Committee shall serve terms of three (3) years. Any vacancies shall be filled in accordance with the provisions set forth in Resolution #1993-R-58. All members shall serve without compensation.

5. The meetings of the Carson River Advisory Committee shall be held regularly at least once each month or at the call the chair. The City shall provide secretarial services to the Carson River Advisory Committee.

6. Members of the Carson River Advisory Committee may be removed by the Board of Supervisors for continued absence or other good cause.

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CARSON CITY, NEVADA

CONSOLIDATED MUNICIPALITY AND STATE CAPITAL

RESOLUTION NO. 1994-R-32

A RESOLUTION OF SUPPORT OF PLANNING FOR THE FUTURE OF THE CARSON RIVER

WHEREAS, the Carson River has always been and continues to be an important part of this community signifying our high quality of life; and

WHEREAS, the Carson River has been part of the community's masterplan since 1983; and

WHEREAS, the City respects the rights and concerns of private landowners along the Carson River by stating there is no present intent to use the powers of eminent domain now or in the foreseeable future; and

WHEREAS, the Carson River has been and should continue to be a resource for outdoor recreation for the enjoyment of all citizens; and

WHEREAS, the Carson River offers outstanding natural, cultural and wildlife resources; and

WHEREAS, the Carson River and its reflection of the rural character of Carson City should be planned for future generations.

NOW, THEREFORE, be it resolved the Carson City Board of Supervisors does hereby resolve to support the creation of a Citizens Task Force to develop and recommend a course of action for the future of the Carson River public lands within Carson City that will be proposed as an amendment to the City's masterplan.

ADOPTED this 7th day of April, 1994.

AYES:	Supervisors	Greg Smith
		Janice Ayres
		Tom Tatro
		Kay Bennett
		Marv Teixeira, Mayor
NAYES:	Supervisors	None
ABSENT:	Supervisors	None

Marv Teixeira

ATTEST: MARV TEIXEIRA, Mayor

Kiyoshi Nishikawa

KIYOSHI NISHIKAWA, Clerk-Recorder

Appendix 2.

Carson River Advisory Committee Letter to the Bureau of Land Management on Pine Nut Mountain Management Plan

CARSON RIVER ADVISORY COMMITTEE
2621 NorthGate, Carson City, Nev 89706

David Loomis Team Leader
Bureau of Land Management
Carson City District Office
1535 Hot Springs Road
Carson City, Nevada 89706 0638

Dear Mr. Loomis,

We want to thank you for this opportunity to comment on the Pine Nut Mountain management plan. This letter represents a consensus opinion of the Carson River Advisory Committee.
The Advisory Committee was established by the Board of Supervisors to make recommendations on the Carson River for the Carson City Master Plan. There are nine appointed members with Supervisor Kay Bennett as the Board representative. More than $^{1}/z$ the membership of the board are land owners adjacent to the Carson River. There are also resource specialists in the makeup of the Committee. We have attached a brochure that highlights areas of responsibility and goals for the Committee.

In regards to your plans for fire management strategies the Committee recommends the following:
We do not know the history of BLM's success with control burns in an ecosystem like the pinyon juniper. We certainly would support burning activities that lessen the fire hazard. We would just like to be shown or given more information on safety measures or procedures for this type of of control.
Firewood cutters do some damage to the resource when they come into the area. We assume they would be able to drive off road to get to the trees which would cause quite a bit of damage. We would support tree cutting if it can be done with minimal damage to the resource.

The proximity of the residential area to this area make "let burn" not a viable option.
We are especially interested in the management of OHV designations in the Pine Nut Mountains. We are not against OHV use in the Pine Nuts but we feel the resources in the watershed of the Carson River should have a priority in their management. We do want to support an area to be set aside for OHV use in this plan.

We would like to make the following recommendations:

The power line road dissecting the western side of the mountain range become a line for designation of closed and limited. From the power line road East the designation should be limited. West of the Power line road should be closed up to the Douglas County Line.

The ridge of the Pine Nut Mountains on the western Slope would be the western edge for the open designation. This would allow all the watershed directly flowing into the Carson River to be limited at the most.

We feel a new trail head should be established at the ridge on Sedgeway Drive for the 0HV's. The local residents have asked that Sedgeway then be paved up through the residential area to eliminate the dust problem.

Any OHV not registered as a legal vehicle should not use any established maintained roadway.

All the areas should be properly signed according to the designations.. The use of Carsonite type signs with decals on each road is recommended.

In regards to the visual management inventory we suggest that all the areas visual from the River corridor would be classified as II. We would reccomend the III classification just over the watershed line suggested for OHV open designation.

Two more important issues we want to address are overnight use and revegatation. We would like to see a revegetation plan for the disturbed areas be part of this plan. We also want to highly recommend that no overnight use be allowed in the Carson River watershed area.

The Committee has established 12 goals and the above comments are related to specific ones as follows:

Goal #2. **Develop a plan for the safety and security of the public, wildlife, and natural resources on public and private land.**

Violations of trespass have been observed on private property by the OHV's. We feel it is also a safety issue with the OHV in heavily used areas along the River and residential areas below the Power line road. Unregistered vehicles are not allowed public roadways and do not support the maintenance of roadways through registration fees.

Goal #3 **Develop a Natural Resource Plan**

A major component of the Plan is to consider the watershed. The use of OHVs on the western slope of the Pine Nut Mountains has caused serious damage to the drainages. This damage to the watershed has a very detrimental effect on the water quality of the River. The drainages have been so badly damaged that the incidents and effects of flash floods appears to have increased.

Goal #5 **Develop program for enhancement/protection/preservation of Wildlife**.

Restricting vehicles in the River area will benefit the wildlife and habitat in those areas as the water of the River attracts all the wildlife.

Goal #6 **Develop a plan to protect/enhance/preserve/restore cultural resources**

The Carson River area is rich in history and the indiscriminate OHV use can damage the resources. Closing the Carson River to OHV's will help protect these areas.

We hope you can support our goals to protect the Carson River for futures generations. Our goals were established to protect the resources of the Carson River and feel we have some very viable options for your review.

Thank you for your consideration to these matters,

For the Carson River Advisory Conunittee:
Charlene Foerschler
Chairperson

cc Steve Kastens Parks and Recreation Director
Walt Sullivan Community Development Director

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Appendix 3

Nevada State Parks / Dayton State Park Bird Check List

Mimids and Thrashers
_____ Northern Mockingbird
_____ Sage Thrasher

Robins and Bluebirds
_____ American Robin
_____ Western Bluebird

Gnatcatchers and Kinglets
_____ Blue-gray Gnatcatcher
_____ Golden-crowned Kinglet
_____ Ruby-crowned Kinglet

Waxwings and Starlings
_____ Cedar Waxwing
_____ European Starling

Shrikes
_____ Northern Shrike
_____ Loggerheaded Shrike

Warblers and Vireos
_____ Warbling Vireo
_____ Orange-crowned Warbler
_____ Nashville Warbler
_____ Common Yellowthroat
_____ Yellow-breasted Chat
_____ Yellow Warbler
_____ Yellow-rumped Warbler
_____ MacGillivray's Warbler

Icterids
_____ Western Meadowlark
_____ Red-winged Blackbird
_____ Brewer's Blackbird
_____ Brown-headed Cowbird
_____ Northern (Bullock's) Oriole

Finches and Sparrows
_____ Black-headed Grosbeak
_____ Evening Grosbeak
_____ Lazuli Bunting
_____ House Finch
_____ American Goldfinch
_____ Lesser Goldfinch
_____ Green-tailed Towhee
_____ Rufous-sided Towhee
_____ Dark-eyed Junco
_____ Savannah Sparrow
_____ Vesper Sparrow
_____ Lark Sparrow
_____ House Sparrow
_____ Black-throated Sparrow
_____ Sage Sparrow
_____ Chipping Sparrow
_____ Tree Sparrow
_____ Brewer's Sparrow
_____ White-crowned Sparrow
_____ Fox Sparrow
_____ Song Sparrow
_____ Lincoln's Sparrow

Others
_____
_____
_____
_____
_____
_____
_____

Please fold and deposit this list off in one of our fee collection tubes upon your departure.

This list will assist in updating the Dayton State Park's Resource Management Plan. Public participation is always welcome and encouraged in the preservation of our Nevada State Heritage.

Compiled by Glen R. Gill, volunteer for Nevada State Parks. February, 1995.

Dayton State Park
PO Box 1478
Dayton, Nevada 89403
(702) 687-5678

Birds of Dayton State Park

NEVADA
STATE PARKS

We need your assistance and skills in identifying the birds of this park!

Please help us by completing the following questions before beginning your bird observations:

Date:_____

1. Do you have a bird guide ( ) or a pair of binoculars ( ) with you this visit?
(please check appropriate boxes if applicable)

2. How many hours of bird watching/identification do you have?
a. ( ) Under 30
b. ( ) 30 - 80
c. ( ) 80+

Thank you, please enjoy your stay.

Waterfowl
_____ Common Loon
_____ Western Grebe
_____ Horned Grebe
_____ Pied Billed Grebe
_____ White Pelican
_____ Double-crested Cormorant
_____ Whistling Swan
_____ Canada Goose
_____ Snow Goose
_____ White-fronted Goose
_____ Mallard Duck
_____ Pintail Duck
_____ Gadwall Duck
_____ American Widgeon
_____ Blue-winged Teal
_____ Cinnamon Teal
_____ Green-winged Teal
_____ Wood Duck
_____ Redhead Duck
_____ Canvasback Duck
_____ Ring-necked Duck
_____ Greater Scaup
_____ Lesser Scaup
_____ Common Goldeneye Duck
_____ Bufflehead
_____ Common Merganser
_____ Red-breasted Merganser
_____ Ruddy Duck

Hawks, Eagles, Vultur[illegible]nd Falcons
_____ Turkey Vulture
_____ Northern Goshawk
_____ Cooper's Hawk
_____ Sharp-shinned Hawk
_____ Northern Harrier/ Marsh Hawk
_____ Rough-legged Hawk
_____ Red-tailed Hawk
_____ Swainson's Hawk
_____ Golden Eagle
_____ Prairie Falcon
_____ American Kestrel

Quail, Pheasant and Grouse
_____ Sage Grouse
_____ California Quail
_____ Chukar
_____ Ring-necked Pheasant

Marsh Birds
_____ White-faced Ibis
_____ American Coot
_____ Great Blue Heron
_____ Green Heron
_____ Black-crowned Night Heron
_____ Great Egret
_____ Snowy Egret
_____ American Bittern

Shore Birds and Gulls
_____ Common Snipe
_____ American Avocet
_____ Killdeer
_____ California Gull
_____ Ring-billed Gull

Pigeons and Doves
_____ Rock Dove
_____ Mourning Dove
_____ Band-tailed Pigeon

Owls
_____ Western Screech Owl
_____ Great Horned Owl
_____ Long-eared Owl
_____ Barn Owl
_____ Burrowing Owl

Goatsuckers
_____ Common Poorwill
_____ Common Nighthawk

Swifts
_____ Vaux's Swift
_____ White-throated Swift

Kingfishers
_____ Belted Kingfisher

Woodpeckers
_____ Red-shafted Flicker
_____ Yellow-shafted Flicker
_____ Lewis Woodpecker
_____ Yellow-bellied Sapsucker
_____ Hairy Woodpecker
_____ Downy Woodpecker

Flycatchers, Larks and Swallows
_____ Western Kingbird
_____ Ash-throated Flycatcher
_____ Willow Flycatcher
_____ Gray Flycatcher
_____ Say's Phoebe
_____ Western Wood Pewee
_____ Horned Lark
_____ Cliff Swallow
_____ Violet-green Swallow
_____ Tree Swallow
_____ Bank Swallow
_____ Rough-winged Swallow

Corvids
_____ Scrub Jay
_____ Pinyon Jay
_____ Black-billed Magpie
_____ Common Raven
_____ American Crow

Parids and Pipits
_____ Mountain Chickadee
_____ Plain Titmouse
_____ Bushtit
_____ Water Pipit

Wrens
_____ House Wren
_____ Bewick's Wren
_____ Rock Wren
_____ Winter Wren

Nuthatches
_____ Red-breasted Nuthatch

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Appendix 4

Carson River Planning Public Workshop Results

Why Plan for the Future of the Carson River?

The increasing population in the region and the resulting development pressures could bring about far
_aching changes to Carson City and its river. *Now* is the time to address existing problems and opportunities along the river and to plan for the protection of the qualities that are valued by the people of the region. At this time there is no plan, but there is a high level of interest in the river. This was documented in the City's Visioning Process last fall, and again by the long list of issues and values generated at last month's public workshop.

The Planning Process

The planning effort must be carried out by the people who care about the river. This process began on February 9, when over 100 people attended a workshop focusing on the Carson River. The purpose of the meeting was to document the river related issues and values that are important to citizens of Carson City.

Working with facilitators in six groups, the participants first listed issues of concern about the river and about the planning effort itself. Then the groups listed the qualities they value about the river. Participants combined similar sounding "issues" and "values" and labeled them to indicate the subject of the list. All of the lists generated at the meeting, along with their headings, are printed below. These issues and values _ will drive the Carson River planning effort: These problems must be addressed, and these are the resources and qualities that need to be protected for the future.

The Next Step

Many people at the public workshop expressed interest in participating in the Carson River planning process. At the March 17th evening meeting of the Board of Supervisors, the steering committee will commend that a citizens' Carson River Task Force be formed. Through the Task Force everyone will have the opportunity to participate in developing solutions to the issues raised at the public workshop.

Workshop Results

Among the concerns you will see in the workshop results are: private property rights, privacy, law enforcement, wildlife, natural beauty, public access, recreation and funding. The following is a transcription of the flip charts from each of the six working groups:

ISSUES

Water Quality/Quantity

- Water availability control
- Sewage

Status Quo

- Leave land alone
- Comment: Most of the river is beautiful as it is. We may lose that by changing things.
- Preserve natural settings
- Leave as is
- Value Keep the river as it is – with public use
- Concern: That the river will change
- We need to preserve our river resource for generations to come so all may enjoy the area.
- Encroachment, golf courses, condos

No existing park maintenance

- The city has not improved park area at 1.loyda Bridge. How can they handle the Whole river
- Comment: The city should use these funds to improve existing public areas on
- river (parks) and/or buy lots which art for sale.
- Concern over City's ability to maintain a larger park area.

Private property rights

- Opening the door to a much greater extent i.e. public or private landowners property.
- Privacy limited.
- Landowners' rights
- Destruction of property
- Comment Private land should not be accessed against the.wishes of residents or land owners.
- Invasion of privacy.
- No control of public on private property
- Irrigation
- Government interference with private rights
- Preserve private property As is
- Infringement on private property.
- Lite Carson River public access is ELM and prison property for public use.
- Don't disturb private land.
- Loss or our money and property.
- My rights as a land owner to have government butt out!
- Taking land from owner:.
- We will not sell our property.

Wildlife impacts

- Value Wildlife and nature left in natural state.
- Concern: Increased access will intrude on wildlife.
- Room for wildlife to live.
- Preserve nature
- Wildlife refuge
- Wildlife preservation
- Driving away existing wildlife
- Loss of vegetation
- Try to leave u much area wild as possible

Law Enforcement

- Law enforcement in th; area along the river.
- Policing
- Uncontrolled shooting
- Keep Out' signs
- Police problem added
- Privacy
- Walking along the river on my private property

Natural environmental quality

- Natural setting
- Plant life
- Natural environment beauty, access
- Wild animal refuge area
- Wildlife, animal and pl.ant
- Abundance/diversity of wildlife
- Value: Wildlife and river as it is!! Keeping it pristine
- Value: Wild horses, water fowl, plants, birds
- Support wildlife
- Wildlife
- Scenic beauty .
- Natural condition wildlife, vegetation
- Wildlife
- Natural beauty! Let's keep it that way.

- The wildlifc, flora and fauna
- Wildlife
- Beautiful, tranquil, nice for short
- canoe trip

Peace and quiet

- Peace and quiet
- Peaceful location
- Rural setting
- Serenity
- Uncrowded
- Peace and quiet (on cold/wet days
- when no shooting/dirt biking)
- Value: Quiet and peaceful nature

PrivateJpublic

- Limited access to privately owned areas and public access to specific public owned areas.

water issues

- irrrigation
- Water quality
- Water availability various purposes

Recreation

- Canoeing access
- Hiking trails

Loss of tax revenue

- Tax. Public lands do not provide a tax base.

Government control without public input

- Mandated government control
- No management by BLM closure
- Too many environmentals screwing with it. Leave it be, as it is.

Habitat impacts

- Environmental impacts of public trails
- Unrestrained pats e.g., dogs
- Wildlife
- Animal/plant natural habitat

Super fund

- EPA clean up effects

Trail impacts

- Visual impact, trail fencing, access parking, toilet facilities
- Park and trail access hours
- Noise impact
- are not needed on both sides of the river

Desi re for multiple use

- True multiple uite.
- Conservation (wise use and management) NOT preservation. sections arc good to control things.

Management and law enforcement

- Lack of police or ranger patrol
- Firearms
- Drugs and alcohol
- Motorized vehicles
- Education and enforcement issues
- Homc owners have already been threatened by hunters.

Flood control

- Flood potential and impart

Public access

- Antagonistic property owners
- Access by public for illegal ad.:ivities
- Public access will cause pollution
- Lack of public access for recreation
- Public access
- Motorized access allowed

Maintenance and funding

- Concerns: Funding for maintenance.
- Maintenance

- River view and Camp Carson arc not maintained now. How can more be maintained.
- Maintenance of parks present and future

Trash/pollution

- Trash, pollution
- Patrols, maintenance, trash
- Pollution
- Garbage. fires during drys, leave alone
- When I need new (used) tires, I can alvays find just my size in the River!

Liability

- Liability
- Liability

Government distrust

- City needs to take care of current problems.
- The increase of taxes to pay for this.
- Waste of tax payers money.
- Government cannot tike• care of what is in their trust.
- Government already owns 87% of land. No more.
- More government bureaucracy, park rangers, fire protection
- Distrust of government process concerning this
- Deer Run. Road pavement
- Liability
- Liability

Owners' rights

- frorced public use of private land
- Invasion of privacy
- Public access to private property
- Use BLM lands for trail
- Will not sell land
- Lack of public opinion
- Government interference with private property

environmental issues

- The pollution of the Carson River The destruction of the nature state of the [river] due to influx of parks and trails
- Washo Tribal member 1. Pollution of river, 2. Loss of wildlife and access for basket materials
- Private property and no trespassing prevents gathering of plants, (food, medicine)
- Community effort to clean up river bank areal.

Crime

- Control of visitors
- Motorcycles •
- I live by the park at Lloyds Bridge. The gunfire bottle shooting, juvenile drinking that the privacy a park offers arc not wanted. Take the park out. Homosexual activity already predominant in our area.
- It ahould be known that there is now wide spread access to the river.
- Changing this to a "corridor' would encourage transient and homeless camping as experieix:ed on the Truckee. Graffiti, garbage and litter would engulf the area. An additional concern is the "100 mile love canal' we arc experiencing due to the sewer water flowing all the way from Woodfords to the 'Carson Sink".
- Crime/danger to children, pets Shooting
- Fires
- Party noise
- Vandalism
- Litter, homeless crime poll

Public access

- The river is a wonderful resource! A government land grab will not be beneficial. The proposed corridor will be detrimental to environment, wildlife and the life of the river.
- To allow the river available to me.
- Transient 'a and campers living along the river

Historic cduc.'adon interpretation

- Access after V & T goes to U.C. new road
- Natural and historic re ourccs nterpretasion

Property rights

- Private owners rights
- Disturbing our privacy
- Government interference on private Property

No action

- Leave it as it is.
- Ieave the river the way it is!!
- No new homes

Infrastructure

- Who decides what?
- Liability
- Maintenance
- Fire
- Medical
- With the developrncrit will come a fcc, now that the river's free
- Toad facilities
- Who is responsible for doing all this mess
- Funding sources for planning and development
- Appropriate use

private rights

- Private land rights
- Government ta_r; lg private land from owners
- Property along the proposed corridor is private, owners property, don't want to give it up.

Trash

- traffic
- Public trashing the area
- Trash
- Making the areas more accessible will invite vandalism and destruction.
- Wildlife suffer as will quality of living there.

Shooting

- Hunting/fishing
- Shooting

Pollution

- Pollution
- Environment
- Water quality

Animated parks that have not been developed,

- Who's to pay?
- Carson has a park along the river. It is accessible now at 5th Street.
- Clean up public areas. Maintain existing parks.
- Who will pay for it? How much? What about insurance?
- City funds to maintain a large recreation area.
- No development_ There is not enough septic, public utilities, etc.
- Property along the river will be sold to
- the highest bidder and public access denied.
- Concern: Dense government along the is not v.antcd.
- Overdevelopment

Threats to wildlife

Access for wildlife
Will be bad for wild life
Eagle
Preservation of wetlands and wildlife is desired
Protect wildlife. Leave river alone.

keep underdeveloped corridor on private property

- keep river as natural as possible.
- No corridor in any existing developed residential areas.
- Present park system is under utilized.
- Why do we need more? Will just raise taxes and nuisance to private citizens.
- Develop parks/ELM land already along the river.
- Failure of parks to maintain existing facilities.

No corridor

- River valley not only floodplain, it is seismological liquid earth. Tnis means the earth turns toliquid (potential "tidal wave" of carth.)
- This is a massively fault ridden area (active) carefully studic by seismology labs around the country. . won't and can't be developed. Therefore development is not a threat so long as we keep our one acre minimum (already low). Any "corridor" development for sight¬seeing tourists (with realtors for development) is ridiculous.
- There already have FATAL accidents in the rural areas every year! We can't support more than residential traffic.

Water for horses

- Water for animals
- Wild horses
- Our areas has wild horses and wildlife. This will be destroyed by more activity and carelessness.

Impact of horses and beavers

- policing
- Surely will not be policed parks.

Amenities

- Provide trails in public areas both mountain/road bikes
- Connection to the community amenity
- Recreation

- flooding
- Protection of floodplain/Don't disturb.
- Noise
- Transients
- Overuse
- Need environmental impact study

Cost infrastructure
- City can't maintain a project that large
- Superfund public health issues

Policing
- Vandalism, vagrancy

Littering
- Litter
- Overuse of the land (litter, etc.)
- The public littering

Access
- Traffic on the river road and Pinion Hills Drive
- Public access
- Public access

habitat impact
- Protection of existing wildlife in itsnatural (as is) habitat.

j\lo change
- Leave the river alone
- Keep river as is

AEricuitural use vs. public
- Corridor is good plan if kept away from livestock there arc many areas that can be developed along that theme.
- Ranchers esttlr do not co- hab well with populated areas The corridor does not work with them.
- Cattle and people do not mix. Rigid control and policing necessary, otherwise good concept.

Government interference, existing property rights
- Just one concern: My rights as a land owner government butt out.
- Carson City taking away private property
- Government interfering with private property
- Leave my land alone!!
- I will fight for my property rights!!
- Infringement on private property
- Govt interference with private property owners
- No respect for the owners now! Lots of trespassers now.

pollution "people"
- Clean up trash areas and keep access open to non motorized vehicles.
- Pollution, trash
- Trash ..
- Garbage
- Environment
- Pollution and garbage
- Noise
- Noise impact
- Low impact recreation opportunities (rafting, trails, picnic areas, etc.)
- Fishery development
- Camping
- Horseback riding
- Picnic
- Hazing
- The trail there already is great and sufficient

Environmental/wildlife & resource protection
- What about the wildlife?
- Wildlife Disruption and environmental problems
- Too many projects with people involved will create a disturbance to the wildlife
- Not destroy wildlife habitat
- Natural habitat preservation
- Concerned about the wildlife geese and bald eagle especially
- Natural resource/open space protection
- Environmental impact
- Why develop pristine land
- Trail fencing
- What are the access plans?
- Off road use.
- Keep public access open along the river to ELM lands on both sides.
- Access to trails are being cut off by private property
- Concerned about loosing access to the river

Traffic
- Increased traffic on Carson River Road if the corridor were to be placed along the river.
- Traffic
- Access parking

Water
- Water flows
- Management of river bank stabilization and clean up of snags.
- Low water flow
- Flood potential
- Water quality
- Poor water quality

Security

Values

peace and quiet

- Quiet and controlled
- Peaceful, quiet. BeautifuL
- Peaceful. Quiet. Soul replenished.
- Isolation. A place to be. Spiritual

renewal.

- Solitude and peacefulness.
- Lack of motorized vehicles.
- Undeveloped areas.

Water

- 'Waters in the desert'

Wildlife and habitat

- Myriad area wildlife and riparian habitat \
- Wild life habitat
- trees and animals
- Animal populations
- Trees
- Wildlife
- Wildlife refuge
- Still relatively untouched
- mosquito replenishment

Scenic beauty

- Views
- Scenic areas, wildlife viewing

History

- Historic ruins
- Along the V & T grade

Recreation

- Rafting
- Rowing
- Swimming
- Photography
- Ideal novice canoe run (Mexican Darn to Deer Run Bridge)
- Picnicking, fishing, hiking
- Recreation
- Sandy area for riding quads
- Room enough for motorcycles,
- equestrians, etc.

Wildlife

- Abundant wildlife
- Undisturbed wildlife
- River has and is natural habitat for Still in its natural Jute
- It is natural
- Wildlife
- Wildlife
- Watching wildlife
- The wildlife and trees
- Wildlife
- Wildlife habitat
- The wildlife
- potential for preservation in natural state
- Willdlife
- The wildlife

Recreation

- Recreation
- Recreation value
- A place to walk, canoe, kayak and enjoy nature
- Recreation potential
- Close to home. For relaxation and recreation.

Flood control

Flood control

Natural beauty

- The natural beauty
- Beautiful views, wildlife scenes The river has its natural beauty
- Attractive

- Beauty
- Pristine visual
- Clean air
- Something to be proud of

Limited access
- Limited access
- Limited use
- Limited access to river

Quiet
- Usually quiet
- Quiet
- Peacefulness, serenity, quiet
- Solitude
- too much traffic

Desirability
- Low density housing development
- Open space
- Privacy

No development
- Good thing = no corridor, no government intervention
- Conservation reserve means zoning.
- Leave it alone.
- Lack of people and government control

Wildlife
- Wildlife
- Wildlife
- Wildlife including endangered animals

Solitude
- Privacy and quiet
- Quietness. Beauty of the undeveloped land.
- Undeveloped
- Solitude, peace

Near water
- Near water
- "Naturalness"
- Natural
- Natural arts.
- History
- Safety
- Safe, kids and animals

Recreation
- Recreation: Rafting, hunting and fishing, hiking/wildlife
- ORV use

No population
- No population (almost no)
- Undeveloped
- Nothing to attract public crowds
- Ability to work in our barns, on our properties without interference
- Limited use

Public access
- Rafting acceas -To be able to camp on the river
    - 1) Develop public lands for trails, fish access etc.; 2) Acquire easement on private land where possible; 3) Keep it rustic if developed for public use 11untary from civic groups. As per iliac Rim Trail. Possible tax break for owners granting easements.

Flooding
- Flooding

Wildlife habitat
- Threat to wildlife
- wildlife protection
- Lots of wildlife habitat
- Degradation of natural resources
- "No Trespassing"

Private property
- Private property
- Owning and paying for right to live in
- quiet area.
- Lirriitcd government interference

Natural heritage
- Provides craft materials (basket weaving, etc.)
- Carson River Washo Tribal heritage and culture
- Tribal heritage provides food ¬(hunting, fishing) and recreation picnicking, swimming

Wildlife
- Bird watching

- Wildlife
- Wildlife• .
- Provide natural setting for animals
- Rustic fishing wildlife

Safety
- Safety
- Safe environment for children

Access
- Access
- Public access
- The places of public access

Limit access
- Not a lot of people
- Minimum of access
- Limited public access
- Ability to keep out riff raft
- No public

Historic issues
- Historic sites

Recreation
- Walking dogs
- Fishing
- Trails
- Recreation
- Rafting
- Hazing
- Off road trails trucks
- Off road use

Cleaner on private land
- This area of the river has been kept cleaner than public area.
- No trash
- Cleanliness in private areas

Views
- Photography
- Four season view
- Open space

Peace quiet and beauty
- Natural beauty
- Natural beauty
- Natural beauty
- Serenity
- Beauty
- Quiet
- Leaving it the way it is!
- Left in its natural state
- No dams

Undeveloped
- We like the "undeveloped" river itsbeauty.
- Like it the way it is
- Serenity

Wildlife habitat
- Accessibility now for the wildlife i.e.
- wild horses
- Wildlife plant habitat (viewing)

Accessibility
- Being able to be in an almost country atmosphere in a 5 minute walk from home. (dirt path/wildlife/river)
- Riverview Park.
- Public access

Visual resource
- Visuals
- Beautiful river must be kept that way by city policing.

peace and quiet

Land misuse
- Liability
- eroding the land and disturbing Inc peaceful river area
  Tramps

Too many dirt bles, ATV etc. now
- Land maintenance
- Unwanted litter
- Eliminate trash, erosion, land abuse We need to know the impact of a corridor on the river and wildlife. Non motorized access
- Create bike trails

- Improve access for canoeing, revise dam
- Interested in bike trails, separate walling trails, and separate horse trails We need more "park" like areas in Carson and less development (housing).

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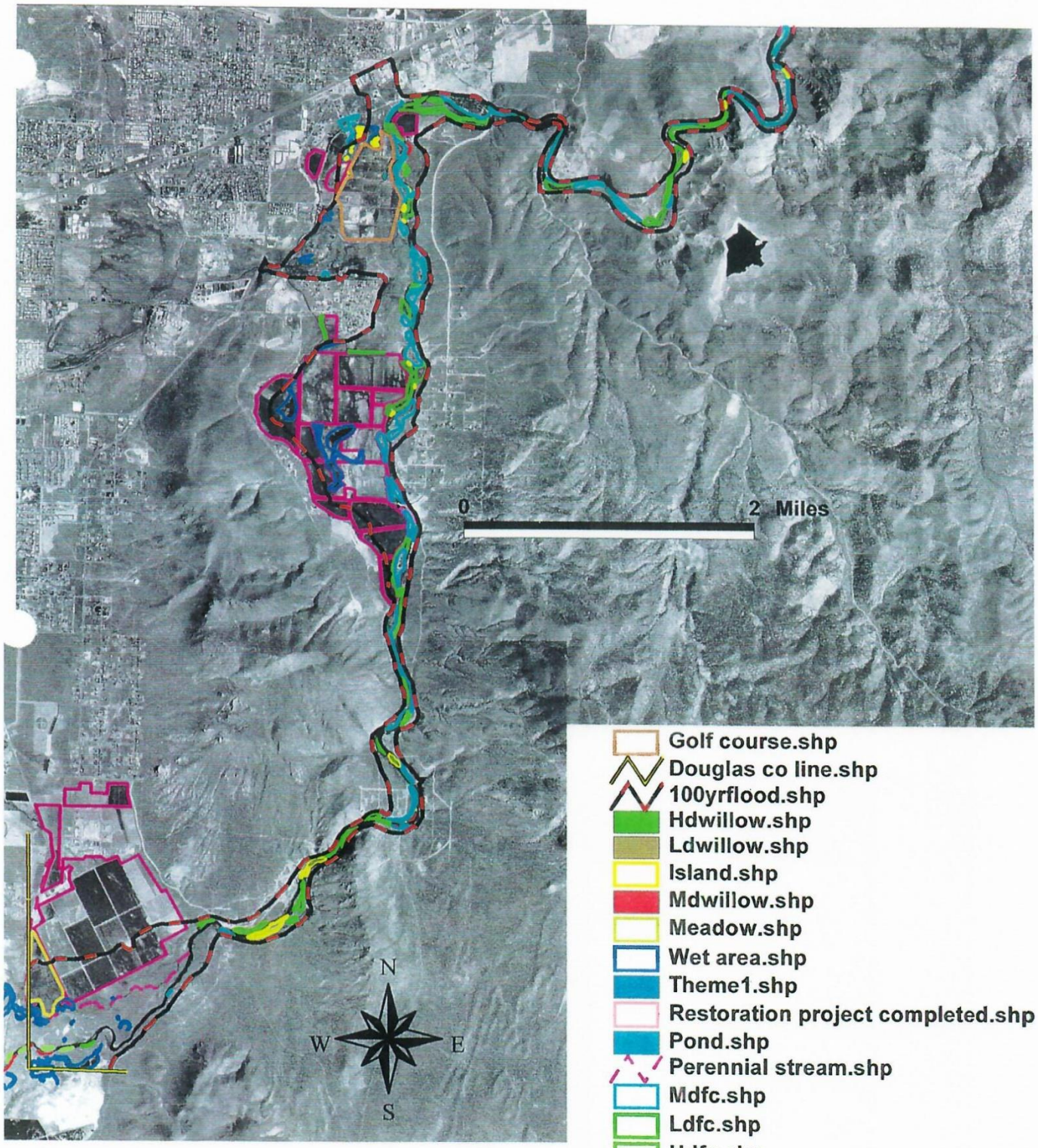
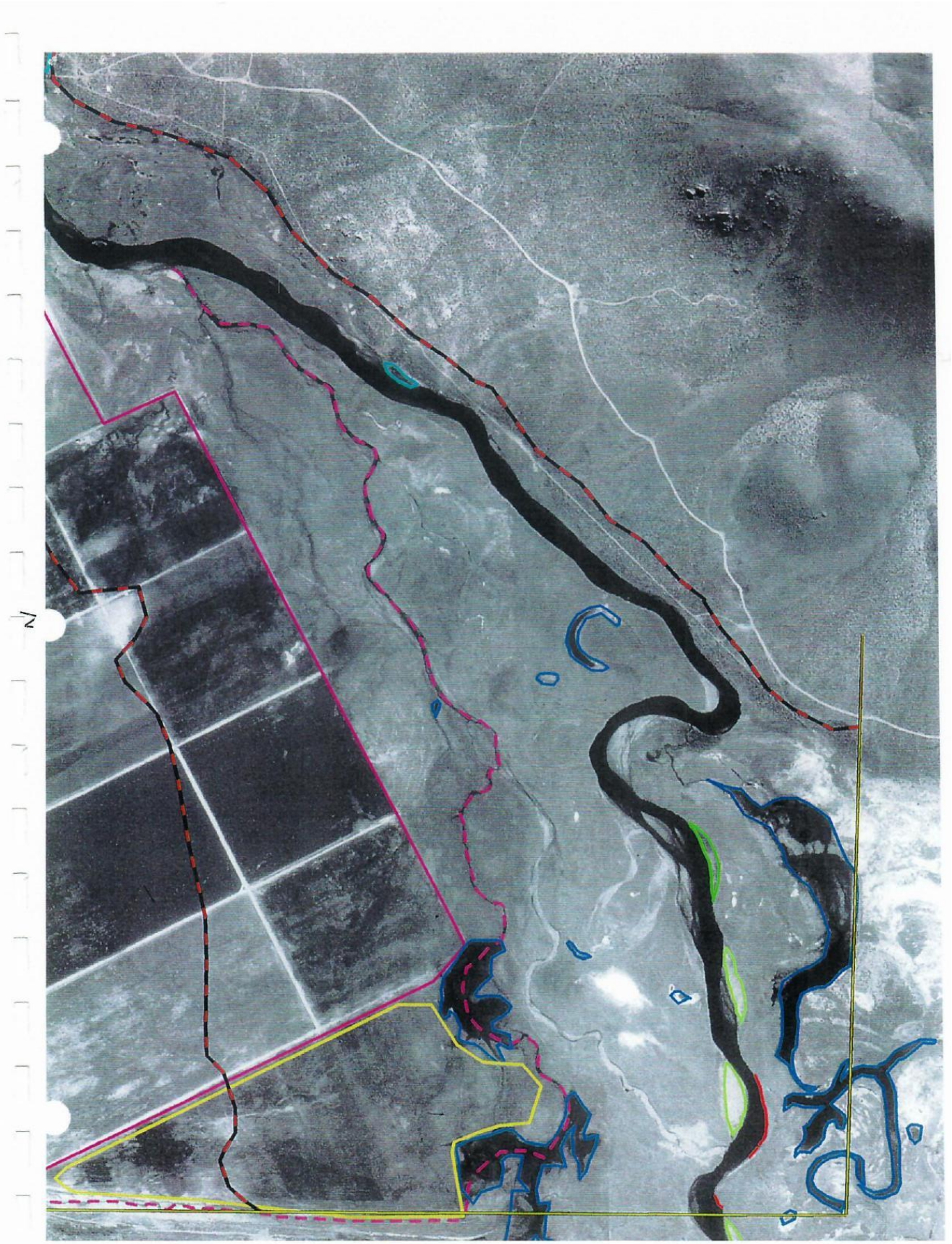
Appendix 5

Digitalized Aerial Maps of the Carson River



approx. scale of individual sheets is 1" = 714'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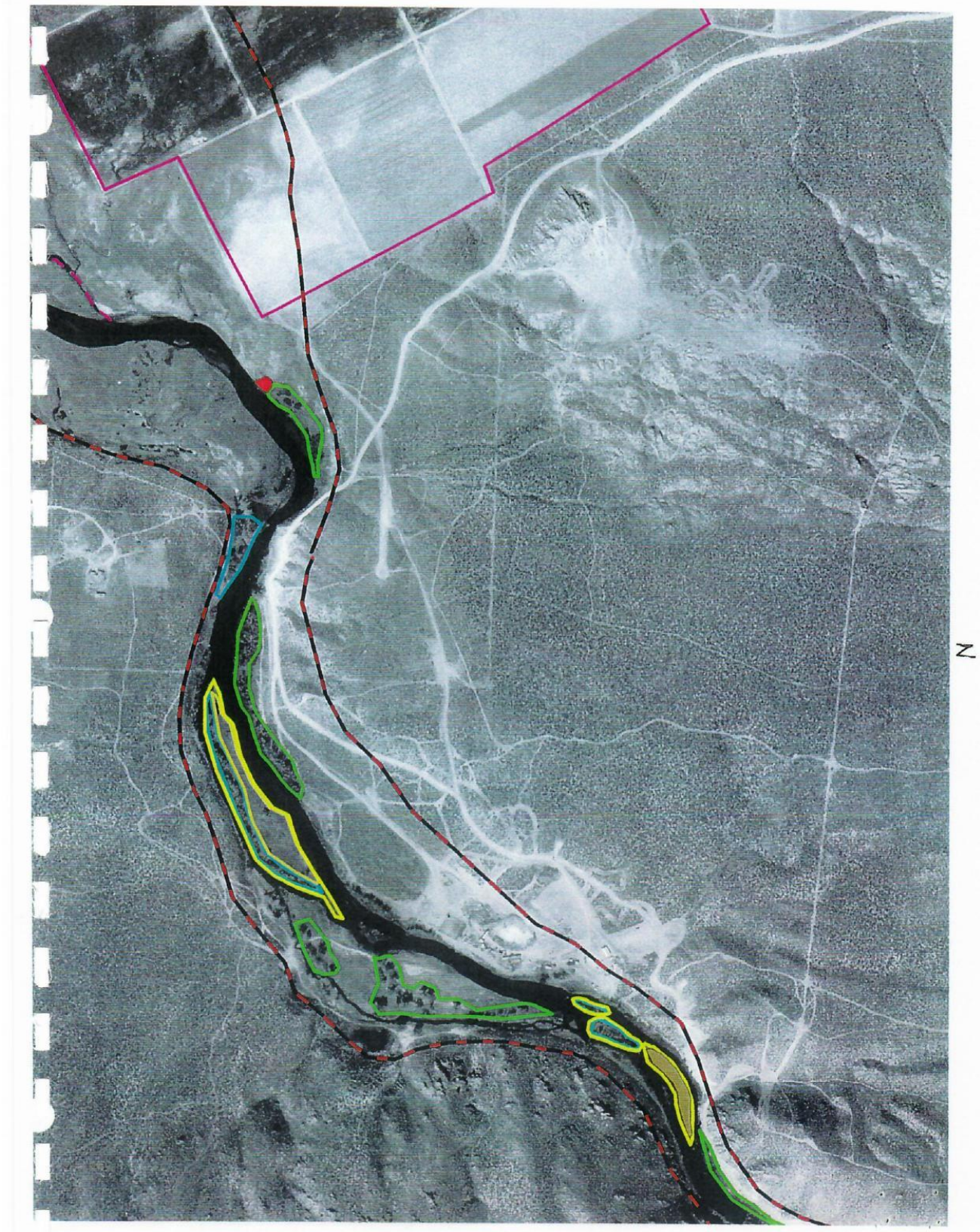
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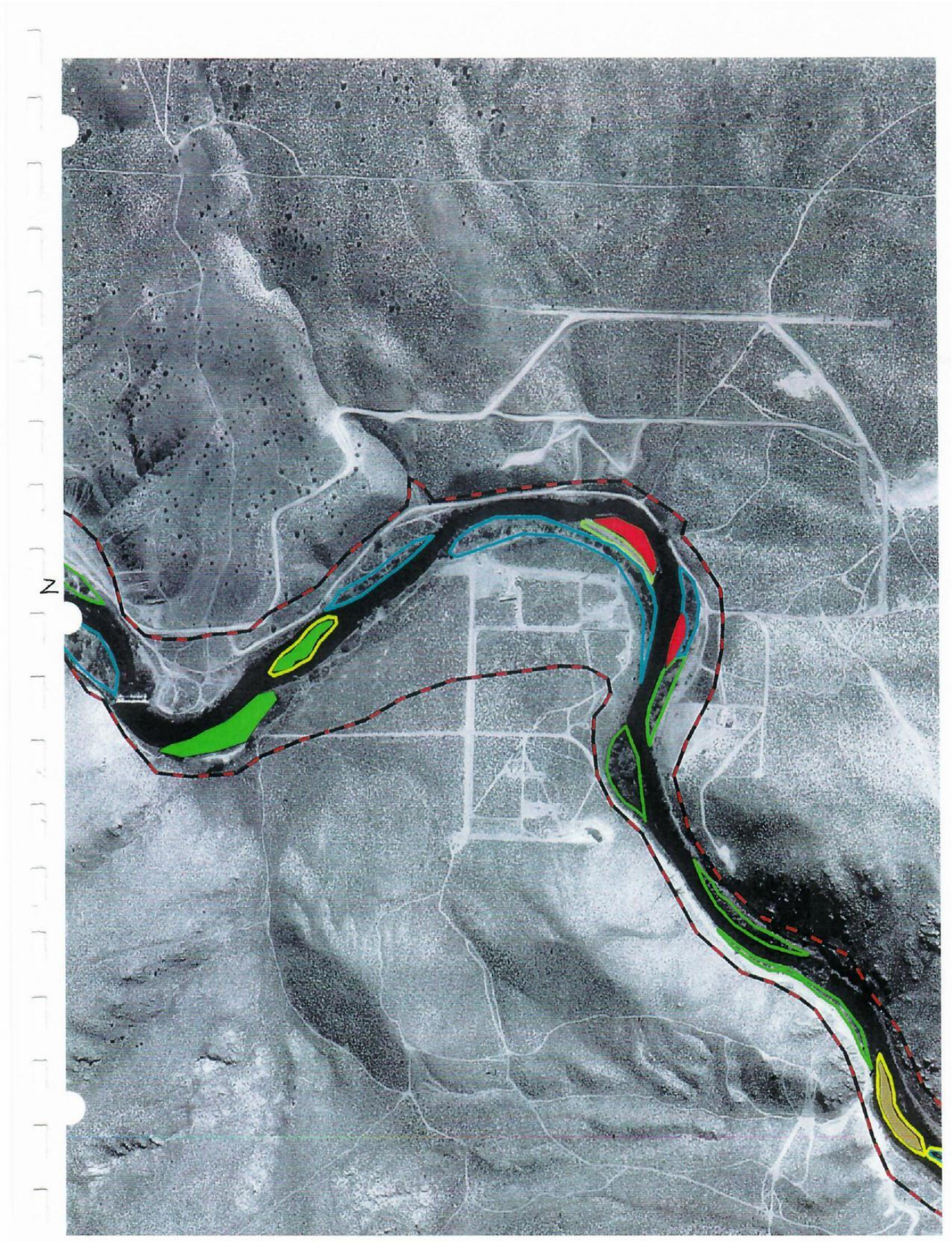
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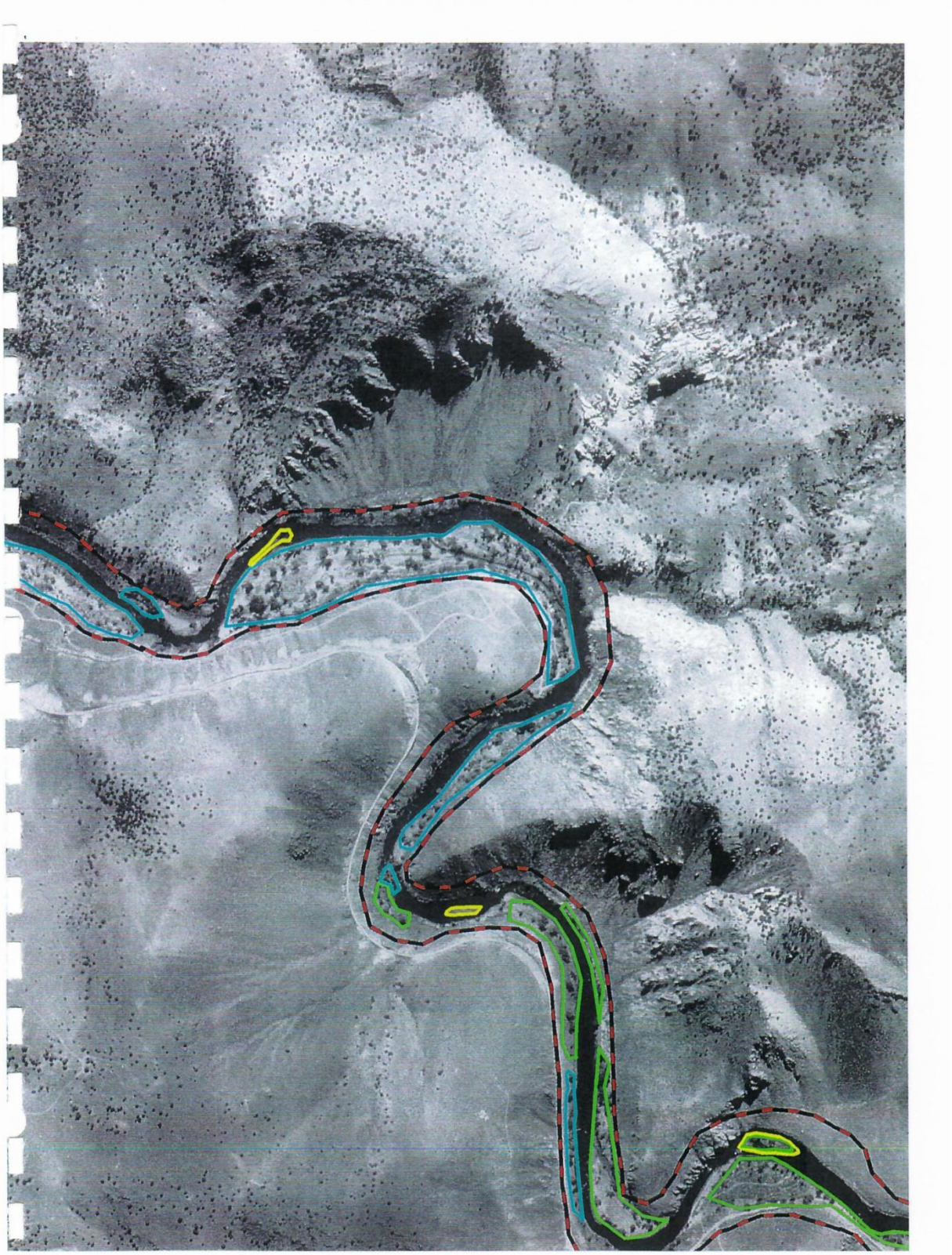
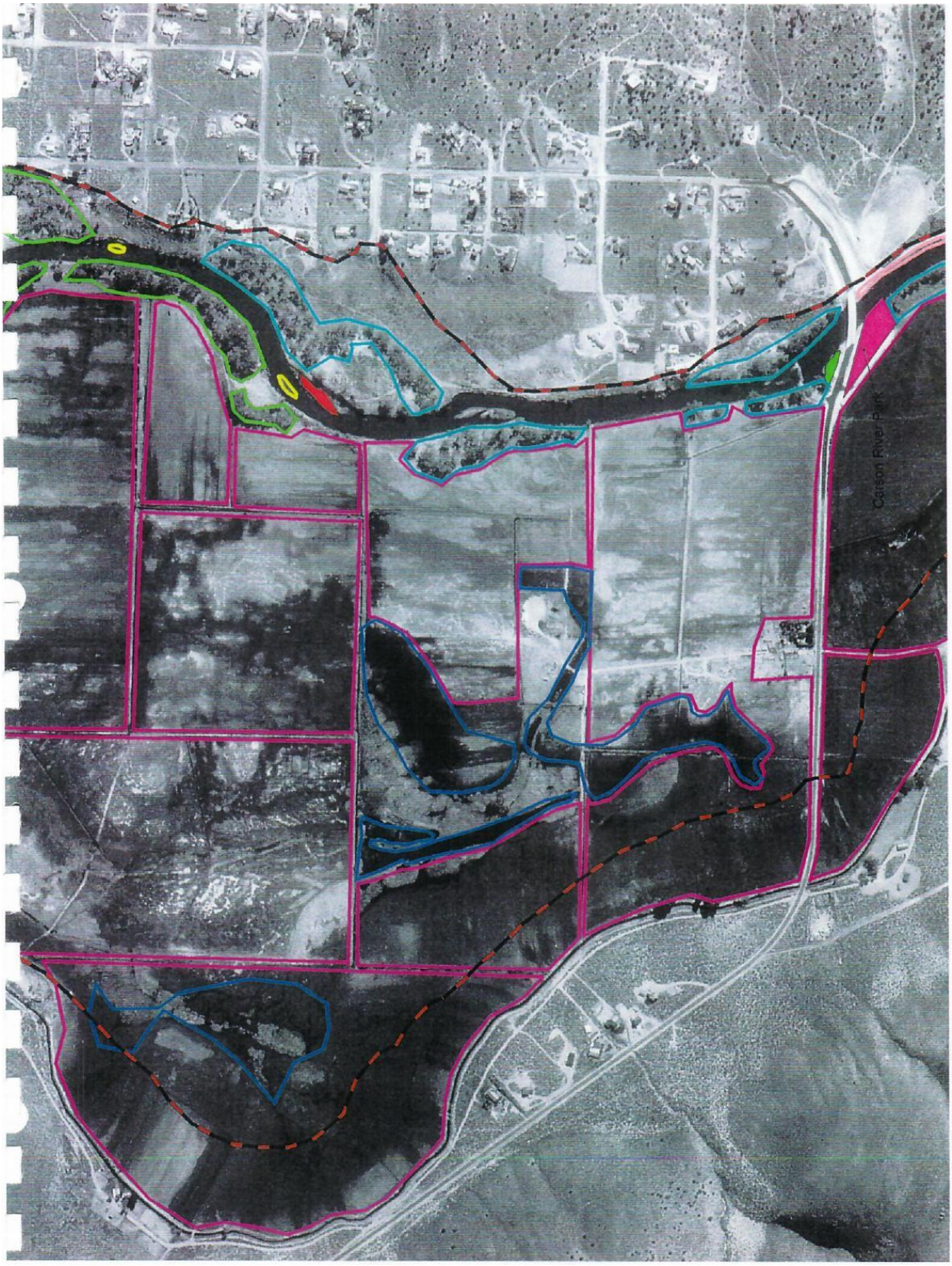
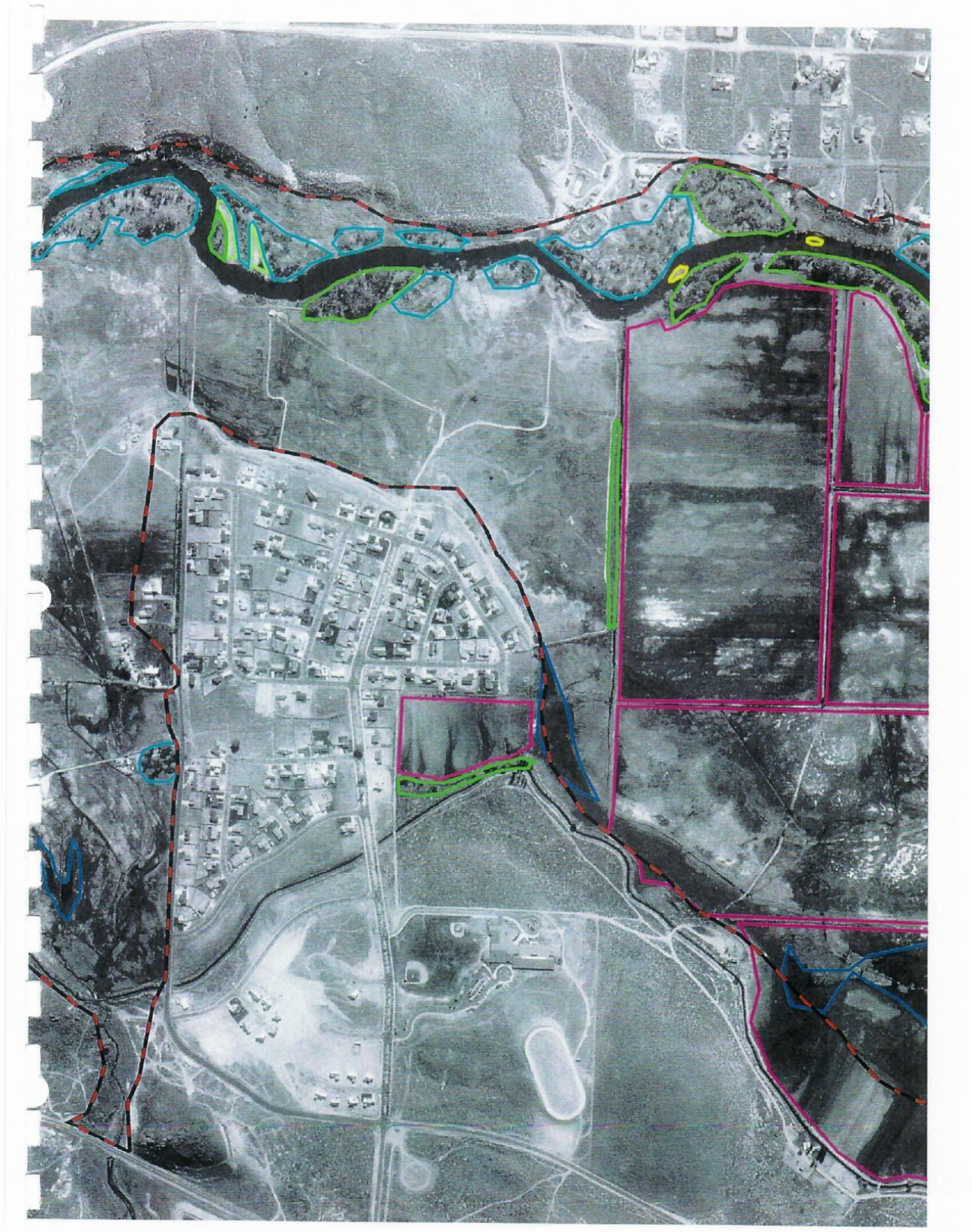
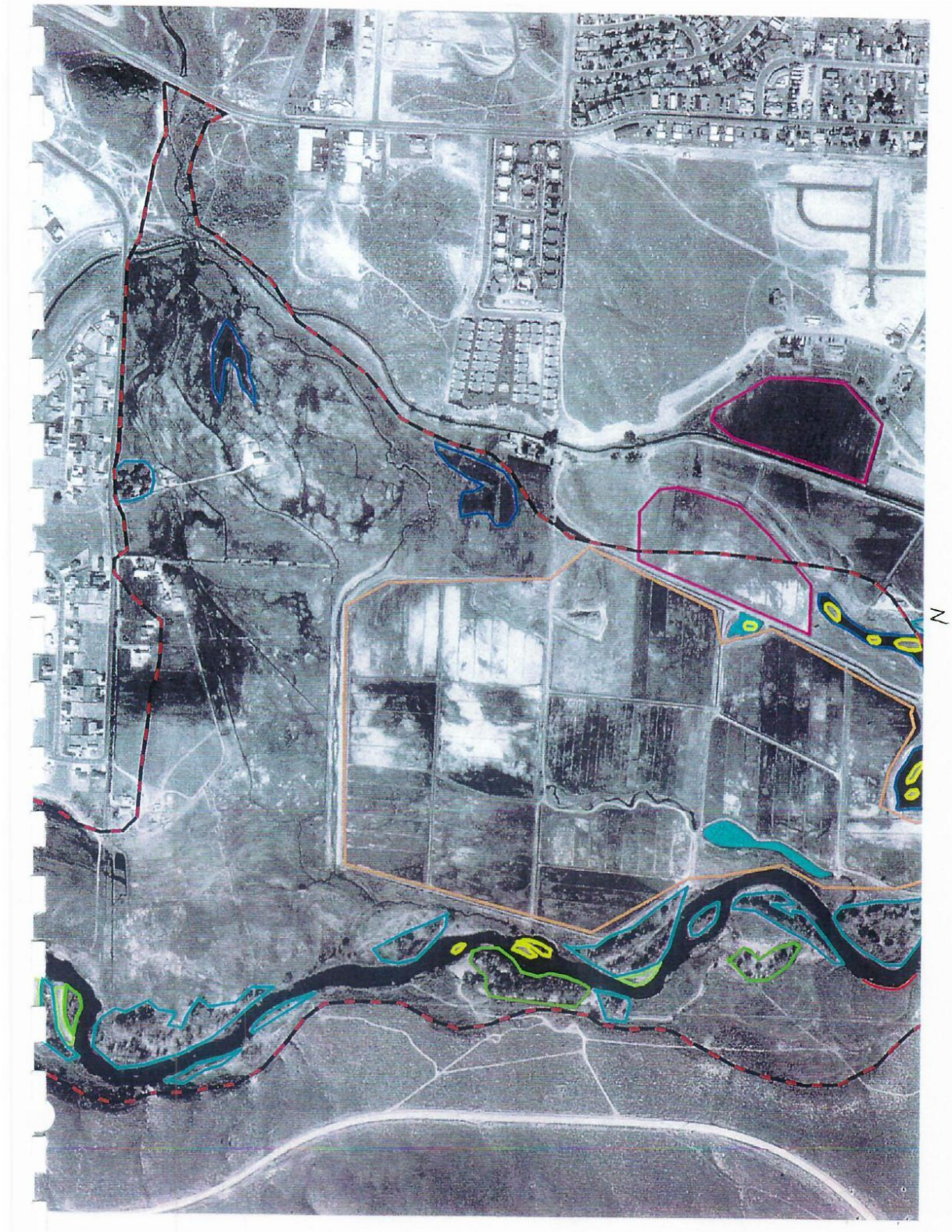



Carson River Park


Carson River Park

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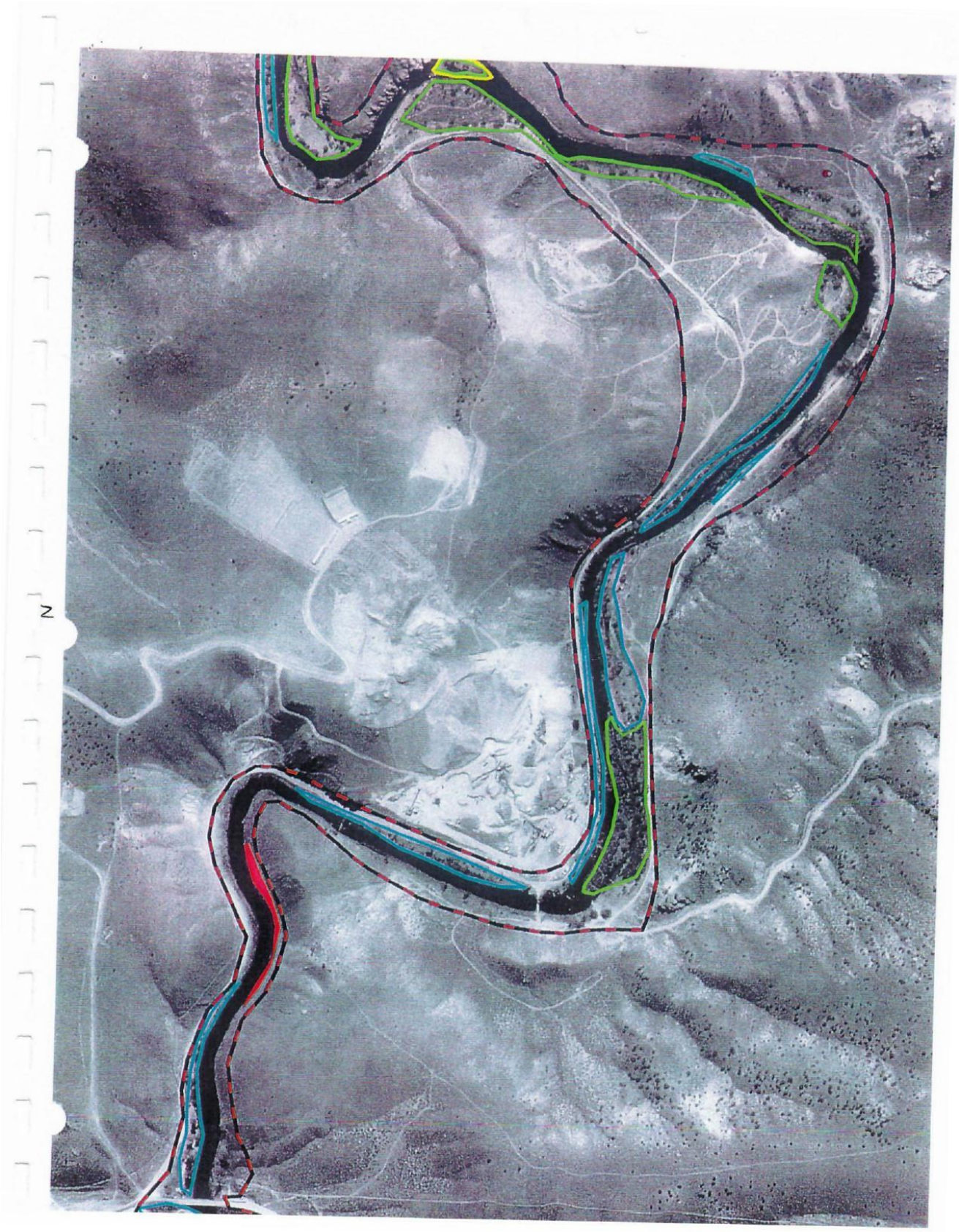
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Appendix 6

Existing Corridor Inventory Worksheet Greenline Woody Species Age Class Data-

USDA NRCS

EXISTING CORRIDOR INVENTORY WORKSHEET

Natural or Introduced Corridor

Riparian/Stream Corridor Type

LOCATION
County _____
Township _____
Range _____
Section _____
Subsection _____

ADDRESS
Landowner _____ mailing
_____
_____ rural post
_____ or fire code
number

Phone # Day: _____ Evening: _____

CORRIDOR INFORMATION
Corridor Type: _____ Corridor Location: _____

Surveyed by: _____ Length: _____ Width: _____

Measure	Yes	No	Few or none	Occasional	Numerous	Excellent	Good	Poor	Don't Know
Natural hydrological processes operate across the site									
A complement of plant species normally associated with community type is present									
All layers of vegetation normally associated with community type are present									
Potential source of large woody debris is within 100 feet of streambank *									
Adequate vegetation to protect banks during high flows is present									
Range of age classes of dominant native tree or shrub species is present *									
Known migration or dispersal corridor									
Invasive, exotic species									
Introduced gaps (clearings, roads, etc.)									
Obstructions in or across stream channel									
Bank collapse or bare spots									
Connected to adjacent patches or corridors									
General plant community vigor									

* Apply only to naturally forested or shrub dominated riparian corridors. If answer to any * question is no, please describe the the problem in the comment section.

Comments: _____

States are encouraged to weight the measures in the matrix and add other criteria where necessary to describe local conditions and to improve the accuracy of corridor ratings and management objectives.

Corridor Rating

Excellent	
Good	
Fair	
Poor	

Corridor Management Objective:

Preservation	
Enhancement	
Restoration	
Other	

New Plantings Recommended:

Yes	
No	

Natural Resources Conservation Service -Conservation Corridor

A-2

Table 6.12. Woody species regeneration field form

Stream/riparian reach name: _____ Date: _____

Drainage _____ Photo # _____

Examiners _____

Location _____

GREENLINE WOODY SPECIES AGE CLASS DATA

SPECIES	NUMBERS OF INDIVIDUAL PLANTS					
	Seed/sprout	Young/sap	Mature	Decadent	Dead	Total
TOTAL						

NOTES

135

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Appendix 7

Supplementary Map Type

SUPPLEMENTARY MAP TYPES

Restoration Project (completed)

A restoration project is an area in the Carson River riparian corridor that has been planted with woody species such as Sandbar Willow, Fremont Cottonwood and shrubs like Silver Buffaloberry Bush Shepherdia argentea. The planting methods using these woody species include willow-cottonwood seedlings, willow stakes, and willow bundles. The propagation of woody species has restored sites from conditions of eroded banks, exposed banks and loss of willow/cottonwood habitat. Restoration components on certain sites included a mixture of native basin grass (Sodar Streambank 60% and Greenleaf Pubescent 40%) and artificial duck boxes placed on mature cottonwood. For example, native basin grasses, willow, cottonwood and duck boxes were placed in Carson River Park and Morgan Mill Road River Access Area in Carson City in the Spring, 2001.

Bank Corridor Conditions

Exposed Bank

An exposed bank is an area above the river forming flow that is devoid of vegetation.

Eroded Bank

An eroded bank is a vertical riverbank subject to frequent and severe erosion.

Land Types

Recreation Area

A recreation area is a site that contains trails and paths, where members of the public walk and or use recreational vehicles. The land can be corporate, private or publicly owned. Recreation areas are frequented by a range of species such as mammals, birds, reptiles and amphibians, which can tolerate some disturbance. Species however tend to avoid closer contact with people in these and other areas; and are commonly nocturnal or active during night time.

Developed Recreation

A developed recreation area will be defined as a planned site that is specifically designed for recreational activities e.g. a park. Species that frequent these areas are able to tolerate disturbance from people such as noise and modifications to habitat, provided fragments of habitat exist. The majority of bird species could be found in parks, if parks are managed so as to preserve some portion of undisturbed and/or less disturbed habitat. Trails are beneficial to access all habitat for nature viewing. Bird boxes placed along trails will attract cavity nesters. The American Kestrel Falco sparverius has nested in Carson City parks in low-density cottonwood

(Walters, 2001). The Bullock's Oriole, now called the Northern Oriole Icterus galbula has been observed in park areas during summer months (Walters, 2001). The House Sparrow or English Sparrow Passer domesticus and the European Starling commonly nest and forage in developed recreation areas like parks. The European Starling is detrimental to native American songbirds, since they fiercely take over nests and consume wild fruit stock (Audubon, 1999). Starlings were introduced from Europe into New York in 1890 (Field Guide to the Birds of North America, 1987).

Intensive Recreation

Recreation areas like these are characterized by multiple paths and or recreation vehicle roads/trails that are adjacent to or intersecting the Carson River corridor.

Golf Course

The north end of the study area on City owned land contains this type. Golf Courses provide developed and structured recreation opportunities in addition to providing open space in the form of mowed turf grasses. The introduced grasses are managed to provide a permanent vegetative cover as a recreational playing surface. Several wildlife species, particularly Canada Geese are likely to utilize this habitat on an almost year-long basis. Wildlife utilize golf course grasses directly as forage, however the wildlife food resources provided by this type of management scenario are limited. The association of semi-permanent wet areas and ponds interspersed with this habitat make it valuable for waterfowl, shorebirds, and water birds such as Black Crowned Night Herons and Great Blue Herons.

Other Miscellaneous

Acres not readily classified as a recognized type. Roads, ditches, dwellings, structures and other developed sites within the study area are included in other miscellaneous.

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Appendix 8

Monthly Flow Rates of the Carson River

UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY - NEVADA INSTALLATION 03/16/2001

STATION NUMBER 10311400 CARSON RIVER AT DEER RUN ROAD NEAR CARSON CITY, NV STREAM SOURCE AGENCY USGS
LATITUDE 391052 LONGITUDE 1194140 DRAINAGE AREA 958. DATUM 4600. STATE 32 COUNTY 510
HYDROLOGIC DATA SUBJECT TO REVISION

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	95	135	154	144	---	---	---	---	---	---	---
2	91	96	130	139	157	---	---	---	---	---	---	---
3	85	92	131	122	178	---	---	---	---	---	---	---
4	91	94	129	115	185	---	---	---	---	---	---	---
5	95	98	126	117	190	---	---	---	---	---	---	---
6	98	100	131	116	183	---	---	---	---	---	---	---
7	92	98	126	113	183	---	---	---	---	---	---	---
8	84	98	128	108	156	---	---	---	---	---	---	---
9	84	109	133	112	168	---	---	---	---	---	---	---
10	85	124	141	111	179	---	---	---	---	---	---	---
11	81	127	156	127	173	---	---	---	---	---	---	---
12	85	116	137	135	153	---	---	---	---	---	---	---
13	91	111	145	125	155	---	---	---	---	---	---	---
14	96	111	161	119	152	---	---	---	---	---	---	---
15	86	116	161	120	148	---	---	---	---	---	---	---
16	86	115	163	130	146	---	---	---	---	---	---	---
17	85	118	161	146	158	---	---	---	---	---	---	---
18	83	117	155	146	154	---	---	---	---	---	---	---
19	82	117	155	139	157	---	---	---	---	---	---	---
20	81	121	150	141	152	---	---	---	---	---	---	---
21	82	126	160	142	136	---	---	---	---	---	---	---
22	89	126	162	150	141	---	---	---	---	---	---	---
23	92	111	167	156	142	---	---	---	---	---	---	---
24	99	127	164	153	137	---	---	---	---	---	---	---
25	61	111	164	166	149	---	---	---	---	---	---	---
26	65	128	153	163	---	---	---	---	---	---	---	---
27	70	126	155	165	---	---	---	---	---	---	---	---
28	81	114	163	165	---	---	---	---	---	---	---	---
29	84	151	169	156	---	---	---	---	---	---	---	---
30	95	142	174	153	---	---	---	---	---	---	---	---
31	97		162	144	---	---	---	---	---	---	---	---
TOTAL	2484	3496	4651	4248	---	---	---	---	---	---	---	---
MEAN	47.9	117	150	137	---	---	---	---	---	---	---	---
MAX	97	151	174	166	---	---	---	---	---	---	---	---
MIN	18	92	126	108	---	---	---	---	---	---	---	---
AC-FT	2940	6930	9230	8430	---	---	---	---	---	---	---	---

Unreadable

UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY - NEVADA INSTALLATION 03/16/2001

STATION NUMBER 10311400 CARSON RIVER AT DEER RUN ROAD NEAR CARSON CITY, NV STREAM SOURCE AGENCY USGS
LATITUDE 391052 LONGITUDE 1194140 DRAINAGE AREA 958. DATUM 4600. STATE 32 COUNTY 510
PROVISIONAL DATA

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001 SUBJECT TO REVISION
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	95	115	154	144	---	---	---	---	---	---	---
2	21	96	110	139	157	---	---	---	---	---	---	---
3	[illegible]	97	111	122	178	---	---	---	---	---	---	---
4	21	94	129	115	185	---	---	---	---	---	---	---
5	25	98	126	117	190	---	---	---	---	---	---	---
6	28	100	133	116	183	---	---	---	---	---	---	---
7	32	98	126	113	183	---	---	---	---	---	---	---
8	31	98	128	108	156	---	---	---	---	---	---	---
9	34	109	133	112	168	---	---	---	---	---	---	---
10	35	124	141	111	179	---	---	---	---	---	---	---
11	41	127	156	127	173	---	---	---	---	---	---	---
12	45	116	137	135	153	---	---	---	---	---	---	---
13	51	111	145	125	155	---	---	---	---	---	---	---
14	56	111	161	119	152	---	---	---	---	---	---	---
15	46	116	161	120	148	---	---	---	---	---	---	---
16	46	115	163	130	146	---	---	---	---	---	---	---
17	45	118	161	146	158	---	---	---	---	---	---	---
18	43	117	155	146	154	---	---	---	---	---	---	---
19	42	117	155	139	157	---	---	---	---	---	---	---
20	41	121	150	141	152	---	---	---	---	---	---	---
21	42	126	160	142	136	---	---	---	---	---	---	---
22	49	126	162	150	141	---	---	---	---	---	---	---
23	52	111	167	156	142	---	---	---	---	---	---	---
24	59	127	164	153	137	---	---	---	---	---	---	---
25	61	111	164	166	149	---	---	---	---	---	---	---
26	65	128	153	163	---	---	---	---	---	---	---	---
27	70	126	155	165	---	---	---	---	---	---	---	---
28	81	111	163	165	---	---	---	---	---	---	---	---
29	84	151	169	156	---	---	---	---	---	---	---	---
30	95	142	174	153	---	---	---	---	---	---	---	---
31	97		162	144	---	---	---	---	---	---	---	---
TOTAL	1484	3496	4651	4248	---	---	---	---	---	---	---	---
MEAN	47.9	117	150	137	---	---	---	---	---	---	---	---
MAX	97	151	174	166	---	---	---	---	---	---	---	---
MIN	18	92	126	108	---	---	---	---	---	---	---	---
AC-FT	2940	6930	9230	8430	---	---	---	---	---	---	---	---

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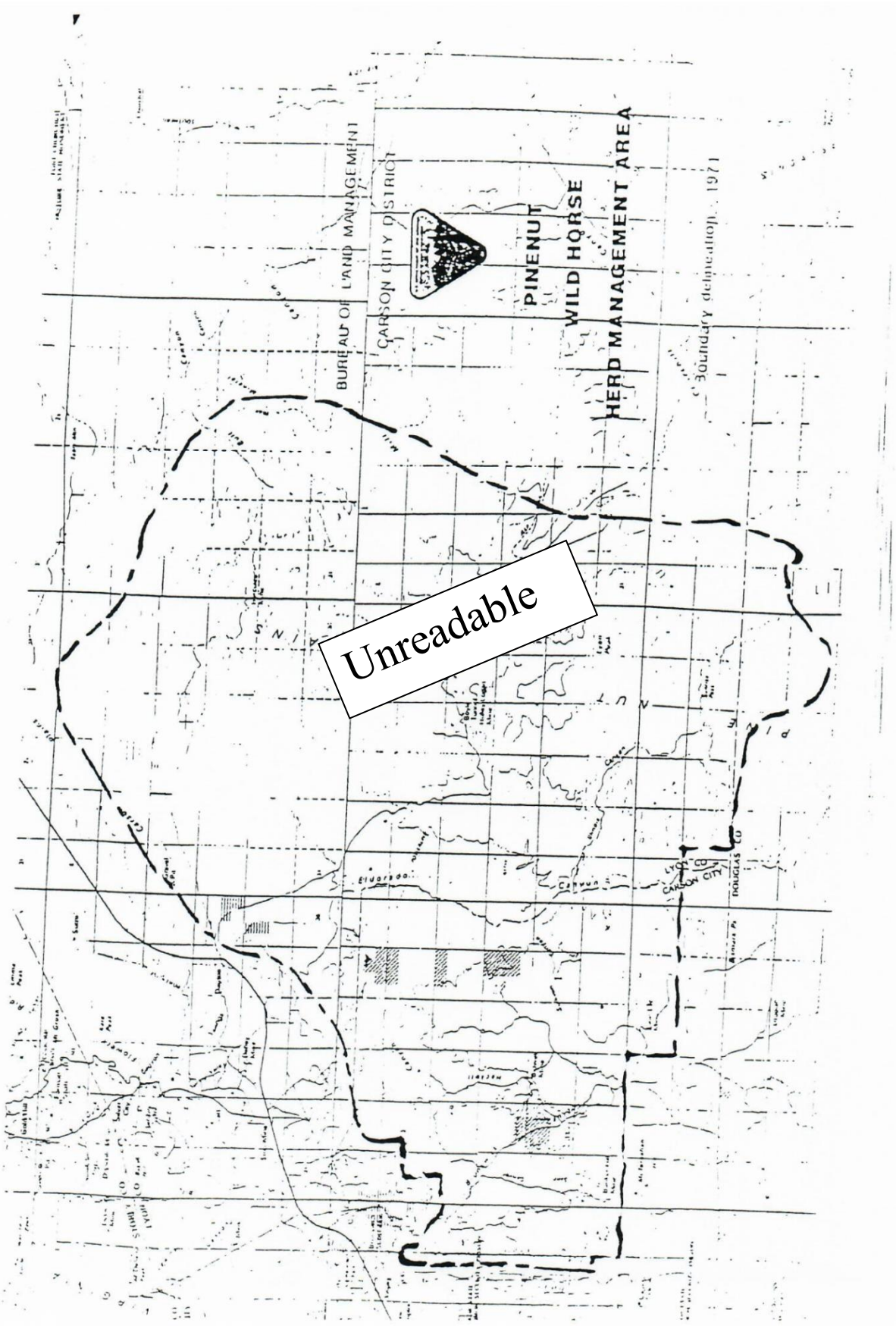
Appendix 9

Pinenut Wild Horse Herd Management Area


PINENUT
WILD HORSE
HERD MANAGEMENT AREA
Boundary delineation, 1971
BUREAU OF LAND MANAGEMENT
CARSON CITY DISTRICT
Unreadable
LYON CO
CARSON CITY
DOUGLAS CO

Appendix 10

Carson City Bird List

CARSON CITY BIRD LIST

List of Sources: Jack Walters of Carson City/Lahontan Audubon Society. James J. Eidel of Carson City/Lahontan Audubon Society. The Carson River/New Empire Bird List. February, 2001. The Great Basin Bird Observatory. Reno, Nevada.

Geographic Area: This bird list covers: From Cradlebaugh Bridge (Douglas County) on Highway 395 to Winters Ranch near Dayton, Nevada, Lyon County. Area covered: One half mile from center of river on both sides, and linear from bridge to ranch. Incline Sewage Ponds (North end) and Carson City Sewage Reservoir included. Both are within a half mile of river (Walters, 2001).

Geological and vegetation make up of area: Starting at Cradlebaugh Bridge: Flat valley, slow moving water until one mile east; then foothills and mountains of the Pine Nut Mountains; rapids and Fremont Cottonwood Communities all the way to Dayton; Hillsides: Pinyon Pine, Utah Juniper, Sagebrush, Rabbitbrush, Horsebrush, Desert Peach, Ephedra, Wild Rose, Saltbrush, Buffaloberry Brush and Willow.

Legend:

S - Summer F - Fall W - Winter Sp - Spring
M - Seen during migration N - The bird nests in the river area

A - Abundant C - Common uc - Uncommon
R - Rarely seen in this area
V - Vagrant that occasionally is seen during migration along the river
rx - Bird migrates most of the time, but occasionally stays the winter on the river

* Endangered + Candidate for listing = Threatened

Grebes:	
Eared Grebe	S F W sp N C
Western Grebe	S F W sp uc
Clark's Grebe	F W N uc
Pied-Billed Grebe	S F W sp N C
Pelicans and Cormorants:	
American White Pelican	S sp C
Double-Crested Cormorant	S F W sp C

Sandpipers, Dowitchers, and Snipe:

Killdeer	S F W sp N C
Long-Billed Curlew	S F sp N C
Willet	S F sp N C
Long-Billed Dowitcher	S F sp M C
Short-Billed Dowitcher	F sp M C
Dunlin	S F sp M C
Sanderling	S F SP M uc
Marbled Godwit	F sp M UC
Greater Yellowlegs	S F W sp M C
Lesser Yellowlegs	S F sp M C
Solitary Sandpiper	S F W N uc
Spotted Sandpiper	S F W sp N C
Common Snipe	S F W sp N

Gulls and Terns:

Bonaparte's Gull	F W R
California Gull	S F W sp A
Glaucous Gull	W R
Herring Gull	F W uc
Mew Gull	W R
Ring-Billed Gull	S F W sp C
Thayer's Gull	F W uc
Caspian Tern	F W uc
Forester's Tern	S sp N C

Vultures and Hawks:

Turkey Vulture	S F sp N C
Sharp-Shinned Hawk	F W sp C
Cooper's Hawk	S F W sp N C
Northern Goshawk	F W uc
Red-Tailed Hawk	S F W sp N A
Swainson's Hawk	S F sp N uc
Rough-Legged Hawk	W M C
Ferruginous Hawk	F W M C
Northern Harrier	S F W sp N C
Osprey	F sp M uc
American Kestrel	S F W sp N C
Prairie Falcon	S F W sp N C
Peregrine Falcon	F M R
Golden Eagle	S F W sp N C
Bald Eagle	F W C

Grouse, Quail, and Pheasants:

California Quail	S F W sp N C
Mountain Quail	S F W sp N C

Chukar	S F W sp N C
Ring-Necked Pheasant	S F W sp N uc
Pigeons and Doves:	
Rock Dove	S F W sp N A
Mourning Dove	S F W sp N C
Owls:	
Barn Owl	S F W sp N uc
Short-Eared Owl	S F W sp N uc
Long-Eared Owl	S F W sp N uc
Great Horned Owl	S F W sp N C
Western Screech-Owl	S F W sp N uc
Burrowing Owl	S F sp N uc
Northern Saw-Whet Owl	S F W sp N R
Nightjars:	
Common Poorwill	F M uc
Common Nighthawk	S F sp N C
Swifts:	
White-Throated Swift	S F sp N C
Hummingbirds:	
Black-Chinned Hummingbird	S F W sp N C
Broad-Tailed Hummingbird	S F W sp N C
Calliope Hummingbird	F sp N uc
Rufous Hummingbird	S F sp C
Anna's Hummingbird	F M uc
Kingfishers:	
Belted Kingfisher	S F W sp N C
Woodpeckers and Sapsuckers:	
Northern Flicker (Red-Shafted)	S F W sp N C
Northern Flicker (Yellow-Shafted)	F W uc
Downy Woodpecker	S F W sp N C
Hairy Woodpecker	S F W sp N C
Nuttall's Woodpecker	sp uc
Lewis's Woodpecker	F W sp N uc
Red-Naped Sapsucker	S F W sp N uc
Flycatchers:	
Western Kingbird	S F M N C
Olive-Sided Flycatcher	S F M N uc
Western Wood-Pewee	S F sp N C

Black Phoebe	S	F	W	sp	N	uc
Say's Phoebe	S	F	W	sp	N	C
Gray Flycatcher	S	F	sp	N	C	
Dusky Flycatcher	S	F	sp	N	C	
Hammond's Flycatcher	F	sp	M	uc		
Cordilleran Flycatcher	S	F	sp	N	uc	
Willow Flycatcher	S	F	sp	N	uc	
Ash-Throated Flycatcher	S	F	sp	N	uc	
Larks:						
Western Meadow Lark	S	F	W	sp	N	C
Horned Lark	S	F	W	sp	N	C
Swallows:						
Tree Swallow	F	sp	M	C		
Violet-Green Swallow	S	F	sp	N	C	
Bank Swallow	S	F	sp	N	C	
Northern Rough-Winged Swallow	S	F	sp	N	C	
Cliff Swallow	S	F	sp	N	C	
Barn Swallow	S	F	sp	N	C	
Jays, Crows and Magpies:						
Scrub Jay	S	F	W	sp	N	C
Pinyon Jay	S	F	W	sp	N	C
Stellar's Jay	S	F	W	so	N	uc
Clark's Nutcracker	F	W	M	uc		
Black-Billed Magpie	S	F	W	sp	N	A
American Crow	S	F	W	sp	N	C
Common Raven	S	F	W	sp	N	C
Titmice and Chickadees:						
Juniper Titmouse	S	F	W	sp	N	uc
Mountain Chickadee	S	F	W	sp	N	C
Bushtits:						
Bushtit	S	F	W	sp	N	C
Creepers:						
Brown Creeper	S	F	W	sp	N	uc
Nuthatches:						
White-Breasted Nuthatch	F	W	sp	N	uc	
Red-Breasted Nuthatch	S	F	W	sp	N	C
Wrens:						

House Wren	S F sp N C
Winter Wren	W M uc
Bewick's Wren	S F W sp N C
Marsh Wren	S F W sp N C
Rock Wren	S F W sp N C
Canyon Wren	S F W sp N uc
Kinglets and Gnatcatchers:	
Golden-Crowned Kinglet	F W M C
Ruby-Crowned Kinglet	F W sp M C
Blue-Gray Gnatcatcher	S sp N C
Thrushes:	
Western Bluebird	S F sp N C
Mountain Bluebird	S F W sp N C
Townsend's Solitaire	S F W sp N C
Hermit Thrush	F W M uc
American Robin	S F W sp N A
Varied Thrush	W R
Swainson's Thrush	F M uc
Shrikes:	
Loggerhead Shrike	S F W sp N C
Northern Shrike	W M uc
Mimic Thrushes:	
Northern Mockingbird	S F W sp N C
Sage Thrasher	S F sp N
Pipits:	
American Pipit	F W sp N uc
Dippers:	
American Dipper	F W uc
Waxwings:	
Cedar Waxwing	S F W sp N uc
Bohemian Waxwing	W M R
Starlings:	
European Starling	S F W sp N A
Vireos:	
Cassin's Vireo	F sp M uc
Plumbeous Vireo	S F sp N C
Warbling Vireo	S F sp N C

Warblers:

Orange-Crowned Warbler	S	F	W	sp	M	C
Nashville Warbler	F	sp	M	C		
Virginia's Warbler	F	sp	M	R		
Yellow-Rumped Warbler (Audubon's)	S	F	W	sp	N	C
Yellow-Rumped Warbler (Myrtle)	F	sp	M	uc		
Black-Throated Gray Warbler	S	F	sp	N	C	
Townsend's Warbler	F	sp	M	C		
Hermit Warbler	F	sp	M	uc		
Yellow Warbler	S	F	sp	N	C	
MacGillivray's Warbler	S	F	sp	N	C	
Wilson's Warbler	S	F	sp	M	N	C
Common Yellowthroat	S	F	sp	N	C	
Yellow-Breasted Chat	F	sp	M	uc		
Black-and-White Warbler	F	M	V			
Northern Waterthrush	F	sp	N	V		
American Redstart	F	sp	V			

Grosbeaks, Buntings and Sparrows:

Black-headed Grosbeak	S	F	sp			
Blue Grosbeak	S	F	sp			
Rose Grosbeak	F	V				
Lazuli Bunting	S	F	sp	N	C	
Green-Tailed Towhee	S	F	W	sp	N	C
Spotted Towhee	S	F	W	sp	N	C
Vesper Sparrow	S	F	sp	N	C	
Savannah Sparrow	S	F	W	sp	N	C
Song Sparrow	S	F	W	sp	N	
Lark Sparrow	S	F	sp	N	uc	
Black-Throated Sparrow	S	F	sp	N	C	
White-Throated Sparrow	W	M	V			
Sage Sparrow	S	F	sp	N	uc	
Chipping Sparrow	S	F	sp	N	C	
Brewer's Sparrow	S	F	sp	N	C	
Dark-Eyed Junco (Oregon)	S	F	W	sp	N	C
Slate-Colored Junco	W	M	uc			
Pink-Sided Junco	W	M	V			
White-Crowned Sparrow	S	F	W	sp	N	C
Golden-Crowned Sparrow	F	W	M	uc		
Fox Sparrow	F	sp	M	uc		
Lincoln's Sparrow	S	F	W	M	C	

Blackbirds and Orioles:

Yellow-Headed Blackbird	S	F	sp	N	C	
Red-Winged Blackbird	S	F	W	sp	N	
Brewer's Blackbird	S	F	W	sp	N	A
Brown-Headed Blackbird	S	F	W	sp	N	A
Bullock's Oriole	S	F	sp	N	C	
Western Tanager	S	F	sp	N	C	

Weavers:

House Sparrow	S	F	W	sp	N	C

Finches:

American Goldfinch	S	F	W	sp	N	C
Lesser Goldfinch	S	F	W	sp	N	C
Red Crossbill	S	F	W	sp	N	C
Cassin's Finch	S	F	W	sp	N	C
House Finch	S	F	W	sp	N	C
Evening Grosbeak	S	F	W	sp	N	uc

Accidentals Species on the Carson River:

Black Swift
Purple Martin
Red-Eyed Vireo
Ovenbird
American Tree Sparrow
Scott's Oriole
Summer Tanager

Appendix 11

Bird Field Observations

BIRD FIELD OBSERVATIONS

Bird species observed or heard at **Riverview Park,** Carson City, Nevada by. Date: February 24, 2001. Compiled by Nancy Bish, Lahontan Audubon Society.

Black-crowned Night Heron
Great Blue Heron
Canada Goose
Mallard
American Kestrel
Rock Dove
Belted Kingfisher
Killdeer
Northern Flicker
Western Scrub Jay
Pinyon Jay
Black-Billed Magpie
Common Raven
Marsh Wren
House Wren
American Robin
European Starling
Song Sparrow
House Sparrow
White-Crowned Sparrow
Dark-Eyed Junco
Western Meadowlark
Red-Winged Blackbird
House Finch
Lesser Goldfinch

Bird species observed at **Silver Saddle Ranch,** Carson River Road, Carson City, Nevada. Date: February 24, 2001. Complied by Nancy Bish, Lahontan Audubon Society.

Great Blue Heron
Canada Goose
Common Merganser
Red-Tailed Hawk
Black-Billed Magpie
Bushtit

Bird species observed near **Lloyd's Bridge** and **Brunswick Canyon** in Carson City, Nevada. Date: February 18, 2001. Compiled by Jack Walters, Lahontan Audubon Society.

Bald Eagle
European Starling
Black-Billed Magpie
Say's Pheobe
Black Pheobe
Mallard
Oregon Junco
Common Raven
Song Sparrow
Belted Kingfisher
Scrub Jay

Appendix 12

Soil Survey of Carson City, Nevada

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FOREST SERVICE
U. S. DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
BUREAU OF INDIAN AFFAIRS
NEVADA AGRICULTURAL EXPERIMENT STATION
GENERAL SOIL MAP
CARSON CITY AREA, NEVADA
MAP UNITS
LYON
COUNTY
DOUGLAS
WASHOE
CARSON CITY
Unreadable

Appendix 13

List of Sensitive Species Occurring in Carson City District

List of Sensitive Species Occurring In Carson City District

Nevada Natural Heritage Program, March 2000

SNAME	COMMNAME	Usfws	Blm	Usfs	Srank	Grank	State	Townrange	Prec.
Plants									
Astragalus convallarius var. *margaretae*	Margaret rushy milkvetch				S2	G5T2		015N021E	S
Rorippa subumbellata	Tahoe yellowcress	C	|S|	|S|L|	S1S2	G2	|CE|	015N018E	M
Rorippa subumbellata	Tahoe yellowcress	C	|S|	|S|L|	S1S2	G2	|CE|	015N018E	S
Rorippa subumbellata	Tahoe yellowcress	C	|S|	|S|L|	S1S2	G2	|CE|	015N018E	S
Invertebrates									
Cercyonis pegala carsonensis	Carson Valley wood nymph	<C2	|N|		S2	G5T2		015N020E	M
Euphydryas editha monoensis	Mono checkerspot	<C2	|N|		S2	G5T3T		015N019E	S
Pseudocopaeodes eunus obscurus	Carson alkali skipperling	C			S1	G3G4T1		014N019E	
Speyeria nokomis carsonensis	Carson Valley silverspot	<C2	|N|		S1	G3T1		015N020E	S
Speyeria nokomis carsonensis	Carson Valley silverspot	<C2	|N|		S1	G3T1		015N019E	M
Reptiles									
Elgaria coerulea palmeri	Sierra alligator lizard				S2	G5T3T4		015N019E	S
Mammals									
Aplodontia rufa californica	Mono Basin mountain beaver	<C2NL			S1	G5T3T4	|YES|	015N019E	M
Aplodontia rufa californica	Mono Basin mountain beaver	<C2NL			S1	G5T3T4	|YES|	015N019E	S
Corynorhinus townsendii	Townsend's big-eared bat	(PS)	|N|	|S|I|L|	S3B	G4		015N021E	S
Birds									
Strix occidentalis occidentalis	California Spotted Owl	<C2		|S|I|L|	S1N	G3T3	|YES|	015N019E	S

Appendix 14

Carson City Rare Species List

Nevada Natural Heritage Program

Department of Conservation and Natural Resources
1550 East College Parkway, Suite 145 • Carson City, Nevada 89706-7921
voice: (775) 687-4245 • fax: (775) 687-1288

CARSON CITY RARE SPECIES LIST
(15 February 2001)

This list provides information for the 49 Carson City plants and animals included on the Nevada Sensitive Animal and Sensitive Plant lists and on the Nevada Plant and Animal Watch List, including the various agency status and ranks, geographic range by state(s) and Nevada counties, and sand and wetland habitat indicators. These data reflect **only what was entered in our computer databases** as of the above date; additional information for some species may await processing in paper files, or may have been entered subsequently. More detailed state-wide information for these taxa is available in our Detailed Rare Plant and Rare Animal lists. **Further information** may be available on-line for some taxa in other lists or reports, or as maps or images, and **general information is available for nearly all taxa on the NatureServe web site.**

Click on a column heading for an explanation of that column. You may need to **scroll horizontally** in your browser to see all columns. You may also jump to the sensitive taxa or the watch-list taxa.

RANKS.....	ESA.	BLM	FS.	NV.	3N	TAXON NAME AND (VERNACULAR NAME).....	HAB	HISTORIC RANGE.	END
SENSITIVE TAXA									
********** Dicots									
T2G5 S2					D	Astragalus convallarius var. margaretiae (Margaret rushy milkvetch)		Cc,Do,Ly,St	Y
G2 S1S2	C	s	sl	CE	T	Rorippa subumbellata (Tahoe yellowcress)	W	Cc,Do,Wa /CA	
T1T2QG4G5 S1S2					W	Silene nuda ssp. nuda (naked catchfly)		Cc,Wa	Y
********** Insects									
T2G5 S2	<C2	n				Cercyonis pegala carsonensis (Carson Valley wood nymph)		Cc,Do	

3?G5 S2	<C2	n			Euphydryas editha monoensis (Mono checkerspot)		Cc,Do,Ly,Wa	
T1G3G4 S1	C				Pseudocopaeodes eunus obscurus (Carson alkali skipperling)		Cc,Wa	P
T1G3 S1	<C2	n			Speyeria nokomis carsonensis (Carson Valley silverspot)		Cc,Do,Wa	
********** Amphibians								
G2 SH	<C2		l		Rana muscosa (mountain yellow-legged frog)	W	Cc,Do,Wa	
********** Reptiles								
T3T4G5 S2					Elgaria coerulea palmeri (Sierra alligator lizard)		Cc,Do,Hu,Wa	
********** Mammals								
T3T4G5 S1	<C2N L			yes	Aplodontia rufa californica (Mono Basin mountain beaver)	W	Cc,Wa	
G4 S3B	(PS)	n	si		Corynorhinus townsendii (Townsend's big-eared bat)		ALL BUT Do,Li	
G4 S1S2	<C2	s	s	yes	Euderma maculatum (spotted bat)		ALL BUT Hu	
G5 S2S3			il	yes	Martes americana (marten)		Cc,Do,Wa	
G5 S3B					Myotis californicus (California myotis)		ALL BUT El,Eu	
G5 S3B	<C2	n			Myotis ciliolabrum (western small-footed myotis)		ALL COUNTIES	
G4G5 S2B	<C2	n			Myotis thysanodes (fringed myotis)		ALL COUNTIES	
********** Birds								
G5 S3	RI	p	si	yes	Accipiter gentilis (Northern Goshawk)		ALL BUT Cl,Do, Es,Li,Mi/CA	

T3G4 S3B	<C2	p		yes	Athene cunicularia hypugaea (Western Burrowing Owl)		ALL COUNTIES	
G4 S3	<C2	p		yes	Buteo regalis (Ferruginous Hawk)		ALL COUNTIES	
G5 S2B		p	i	yes	Buteo swainsoni (Swainson's Hawk)		ALL BUT Cl	
G4 S2S3B	<C2	n		yes	Chlidonias niger (Black Tern)	W	ALL BUT Cl,Do, Es,Li	
G5 S2S3N			s	yes	Gavia immer (Common Loon)	W	Cc,El,Mi,Wa	
G5 S3		n	s	yes	Oreortyx pictus (Mountain Quail)		Cc,Do,Hu,Wa	
G4 S4?B		p	s	yes	Otus flammeolus (Flammulated Owl)		ALL COUNTIES /CA	
T3G3 S1N	<C2		si	yes	Strix occidentalis occidentalis (California Spotted Owl)		Cc,Ly,Wa /CA	

WATCH-LIST TAXA

********** Dicots

G3 S3				D	Camissonia nevadensis (Nevada suncup)		Cc,Ch,Do,Ly,Pe, St,Wa	Y
G3? S3?				D	Lupinus malacophyllus (soft lupine)		Cc,Do,Ly,Wa	Y

********** Annelids

G? S?					Varichaeta nevadana (endemic Tahoe annelid)		Cc,Do,Wa	

********** Mammals

G5 S3	(PS)			yes	Glaucomys sabrinus (northern flying squirrel)		Cc,Do,Wa	
G5 S3?	(PS)				Lasiurus cinereus (hoary bat)		ALL COUNTIES	

5		<C2	n		Myotis volans		ALL COUNTIES
	S4B				(long-legged myotis)		
G5		<C2	n		Myotis yumanensis		ALL BUT El,Eu,
	S4B				(Yuma myotis)		La,Wp
G5				yes	Ochotona princeps		ALL BUT Cl,Li
	S3				(American pika)		
G5					Sorex trowbridgii		Cc,Wa
	S2				(Trowbridge's shrew)		
G5					Tadarida brasiliensis		ALL COUNTIES
	S4B				(Brazilian free-tailed bat)		
G4					Tamias speciosus		Cc,Do,Wa
	S3				(lodgepole chipmunk)		
********** Birds							
G3		<C2		yes	Agelaius tricolor	W	Cc,Do,Ly,Mi,St,
	S2				(Tricolored Blackbird)		Wa
G5			p	yes	Aquila chrysaetos		ALL COUNTIES
	S4				(Golden Eagle)		
G5			p	yes	Asio flammeus		ALL BUT Cl,Es,
	S4				(Short-eared Owl)		Li,Mi,Ny
G5			p	yes	Dendroica petechia	W	ALL COUNTIES
	S3B				(Yellow Warbler)		
G5			p	yes	Geothlypis trichas	W	ALL COUNTIES
	S3B				(Common Yellowthroat)		
G5			p	yes	Icteria virens		ALL BUT Es,Mi
	S3B				(Yellow-breasted Chat)		
G5			p	yes	Melanerpes lewis		ALL BUT Cl,Es,
	S4				(Lewis' Woodpecker)		Li
G5			p	yes	Numenius americanus	W	ALL BUT Cl
	S3?B				(Long-billed Curlew)		
G5			p	yes	Oporornis tolmiei		ALL BUT Cl
	S4B				(Macgillivray's Warbler)		
G5			p	yes	Pandion haliaetus	W	ALL BUT Cl,Es,
	S2B				(Osprey)		Li,Mi

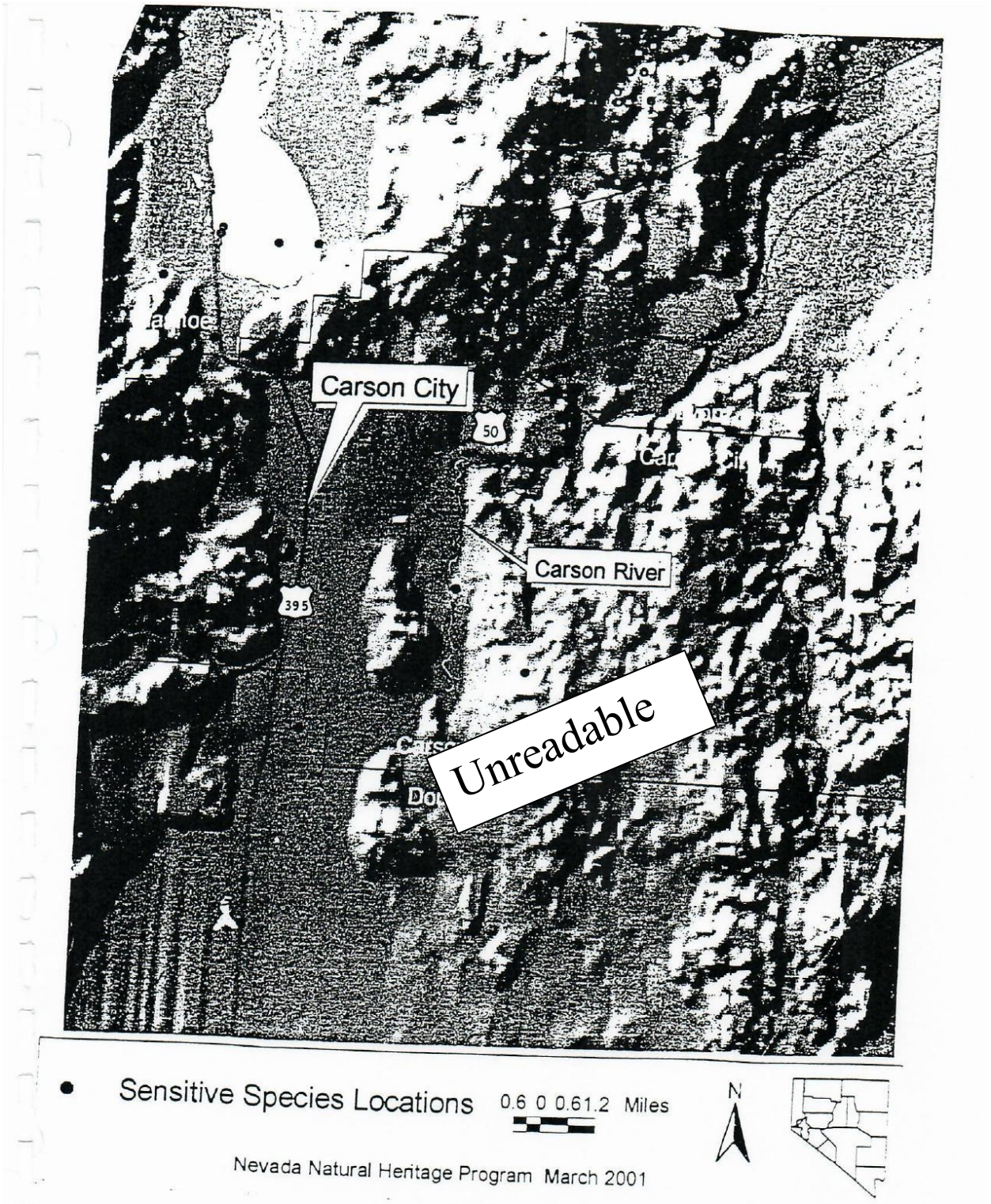
G3 S2B	p	yes	Pelecanus erythrorhynchos (American White Pelican)	W	Cc,Ch,Do,El,Eu, Ly,Mi,Pe,St,Wa+
G5 S4B	p	yes	Vermivora celata (Orange-crowned Warbler)		ALL BUT Cl
G5 S4?B	p	yes	Wilsonia pusilla (Wilson's Warbler)	W	Cc,Do,El,Eu,La, Ly,Mi,Wa

Last Updated on 02/15/2001

Return to Nevada Natural Heritage Program home page

Appendix 15

Sensitive Species Locations


Carson City
50
Carson River
395
Unreadable
Sensitive Species Locations
0.6 0 0.61.2 Miles
N
Nevada Natural Heritage Program March 2001

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