

## **Chapter 7**

## **Land Use and Agriculture**



# Chapter 7 Land Use and Agriculture

## Introduction

This chapter describes the affected environment for land use and agriculture in the study area and the potential impacts on land use and agriculture that would result from the acquisition alternatives and No Action Alternative.

## Sources of Information

The key sources of data and information used in the preparation of this chapter are listed below. Full references can be found in Chapter 17, References.

- ICF Jones & Stokes interpretation of USGS land use information (ICF Jones & Stokes 2008)
- Carson City Field Office Consolidated Resource Management Plan (Bureau of Land Management 2001)
- Lyon County Master Plan (Lyon County 1990)<sup>1</sup>
- Mineral County Master Plan (Mineral County Regional Planning Commission 2006)
- The University and DRI analysis of GIS data related to agriculture (Bonnenfant et al. 2009)

The USGS land use dataset was the foundation for this section because it provides the greatest amount of information in a single dataset, and most study area acreages were calculated from this dataset. For local descriptions, such as agricultural land in Mason Valley, newer and more detailed data were used when available. As a result, total acreages are not consistent. This is particularly true in the case of irrigated land—the USGS data include more land under this category than the newer and more detailed University and DRI data. Data sources are noted throughout this report.

It is important to note that land use is a dynamic resource and therefore it is not possible to present absolute current information; the best information available is presented in the Revised DEIS. In addition, unknown errors may be present in the databases used to create some of the maps. For these reasons, the maps created for this report are for general discussion purposes only, and no project-specific decisions will be made based on these maps.

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<sup>1</sup> The Lyon County Master Plan is under revision, and the revised plan will not be available until later in 2009.

## Affected Environment

This section describes the environmental setting related to land use in the study area. Although the project area is the entire Nevada portion of the Walker River Basin (Chapter 1), the study area for the land use analysis was defined as the following areas in Lyon and Mineral Counties: West Walker River, East Walker River, mainstem Walker River, Walker Lake, irrigated land in the Mason and Smith Valleys, Mason Valley and Alkali Lake WMAs, and a 1-mile zone around this area (based on the USGS data). This study area was selected because it is the greatest extent of land that is expected to be affected by the acquisition alternatives.

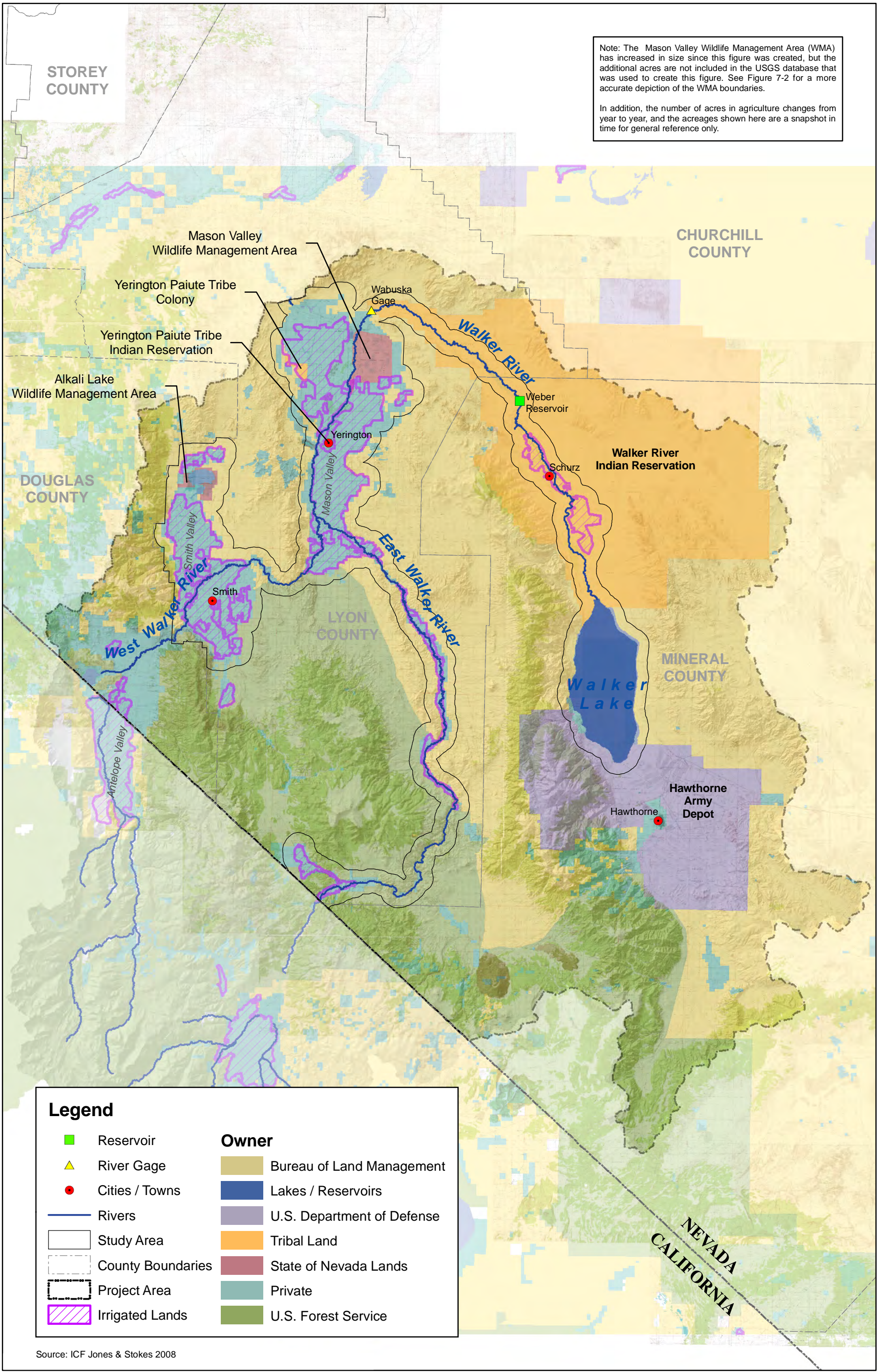
Douglas County, Nevada, and California were not included in the study area. Douglas County was not included because no acquisitions are expected to occur in the county. California was not included because this analysis assumes operations of reservoirs in California would be within the pattern of current use and no acquisitions would occur in California, so there are no expected land use impacts in Mono County (see Reservoir Operations in Chapter 2, Alternatives). Only the portion of the Walker River Indian Reservation within the 1-mile zone around the Walker River and irrigated land is included in the study area. The entire Yerington Indian Reservation and Colony is within the study area.

Land in the study area is under the ownership or administration of the following entities.

- BLM, Carson City Field Office
- U.S. Forest Service (USFS) (Humboldt-Toiyabe National Forest)
- U.S. Department of Defense (DOD) (Hawthorne Army Depot)
- BIA
- WRPT
- Yerington Paiute Tribe (YPT)
- State of Nevada (Alkali Lake and Mason Valley WMAs) and Walker Lake State Recreation Area [SRA])
- Counties of Mineral and Lyon
- City of Yerington
- Unincorporated communities of Hawthorne, Schurz, Smith, and Wellington
- Private ownership

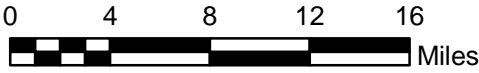
The land uses of these entities (Figure 7-1) are described below.





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Source: ICF Jones & Stokes 2008



**Figure 7-1**  
**General Land Use Map**





### ***Bureau of Land Management, National System of Public Lands***

Much of the land in the Walker River Basin is BLM land, including most of the land surrounding Walker Lake.

In the project area, 763,961 acres (ICF Jones & Stokes 2008) are administered by the BLM Carson City District Office. These lands are used for a variety of purposes, such as herd management areas for wild horses, recreation, mineral and energy leases, and grazing allotments. There are no known active mines in the project area, although there are numerous mining claims (Bureau of Land Management 2001, resource maps).

In the study area, 88,665 acres (ICF Jones & Stokes 2008) are BLM-administered lands. For the most part, these lands occur on the outskirts of Smith and Mason Valleys, along the West Walker River in the Wilson Canyon area, along the East Walker River downstream of the Humboldt-Toiyabe National Forest, and in and around much of Walker Lake (Bureau of Land Management 2007). BLM-designated land uses in the study area include multiple use public land, scenic areas, and mining.

Former mines in the area are the MacArthur Mine and the Anaconda Mine. The MacArthur Mine is an abandoned copper mine on BLM land 6 miles northwest of Yerington. The site was recently reclaimed as part of BLM's mining law program (Bureau of Land Management 2008). The Anaconda Mine (also known as the Yerington Mine) is also an abandoned copper mine, located west of Yerington. Half of the site is on BLM land, and the other half is on privately owned land (U.S. Department of Health and Human Services 2006).

BLM also leases public lands for a small airport, the Rosaschi Air Park, in Lyon County (AirNav 2008).

Some BLM lands in the Walker River Basin may be available for sale (disposal) if they are "uneconomic to manage or have been identified for community expansion or agricultural development and have little value for other resource uses" (Bureau of Land Management 2001). These lands are primarily in the vicinity of Yerington.

### ***National Forest System Lands***

There are approximately 484,575 acres of National Forest System lands in the project area and approximately 46,196 acres of National Forest System lands in the study area (ICF Jones & Stokes 2008). National Forest System lands in the study area are part of the 6.3-million-acre Humboldt-Toiyabe National Forest.

### ***Department of Defense Lands***

The DOD's Hawthorne Army Depot (previously known as the Hawthorne Naval Ammunition Depot) is a 147,000-acre ammunition storage depot on the south end of Walker Lake. DOD has jurisdiction over the southern portion of Walker Lake, and approximately 16,799 acres of the depot are in the study area (ICF Jones & Stokes 2008). The depot is operated by Day Zimmerman Hawthorne Corporation for the Army, which acquired the site from the Navy in 1977. Facilities include 2,427 munitions storage igloos, the Western Area Demilitarization Facility, and a 700-acre bomb disposal site 25 miles northeast of Hawthorne. The depot employs approximately 700 civilians and one military person (Center for Land Use Interpretation date unknown). However, in December 2009 91 people were laid off with more layoffs planned (Reno Gazette Journal 2009).

Several creeks run through the depot and eventually discharge into Walker Lake. The depot uses surface water from Cottonwood Creek, Rose Creek, and Cat Creek, and also has groundwater pumping rights.

### ***Walker River Indian Reservation***

Walker River Indian Reservation comprises 325,000 acres between the northeast end of Mason Valley and Walker Lake. The reservation, with a population of approximately 1,200, was established in 1874 by Executive Order and is under the General Allotment Act of 1887 (Walker River Paiute Tribe 2008a). Most of the land is held in trust by the United States for the benefit of the WRPT (Miller Ecological Consultants 2005).

Approximately 10,000 acres of reservation land were divided into 20-acre allotments and distributed to individual WRPT members. These allotments are also held in trust by the United States, but for the benefit of the individuals (Miller Ecological Consultants 2005).

Most of the land is used for agriculture and is the county's major farming district (Mineral County 2008). Grazing is the primary land use, as well as some ranching (Walker River Paiute Tribe 2008a), but agricultural crops are also an important part of the economic base. Alfalfa is the primary crop grown, mainly along former riparian areas (Walker River Paiute Tribe 2008b). Approximately 2,800 acres have been used at various times for agricultural production. Of this, approximately 2,100 acres are irrigated allotments, consisting mainly of alfalfa and grass hay. In 2007, 2008 and 2009 the allotments were part of a fallowing program and the WRPT provided water to Walker Lake from the fallowing (described in Chapter 3, Water Resources). WRPT had previously irrigated tribal trust land with five center pivots.

The unincorporated town of Schurz is located on the reservation at the intersection of U.S. Highways 95 and 95-A. Land uses in Schurz include residential, tribal headquarters, and commercial, such as a gas station with a



convenience store, a smoke shop, and a fireworks outlet (Walker River Paiute Tribe 2008a and 2008c).

Community resources include the tribal administrative offices, health clinic, and police office; a volunteer fire department; and a school for kindergarten through 8th grade (Miller Ecological Consultants 2005).

Reservation land makes up 268,378 acres of the project area and 60,352 acres of the study area (ICF Jones & Stokes 2008), including all irrigated agricultural land on the reservation and the town of Schurz. The Tribe also has jurisdiction over the northern portion of Walker Lake (Schildt pers. comm.).

### ***Yerington Indian Reservation and Colony***

The Yerington Reservation and Colony consist of two land areas: the Yerington Indian Colony (Colony) and the Yerington Indian Reservation, which is also known as Campbell Ranch. The population of the Colony and Campbell Ranch is 400 tribal members, and the total number of enrolled tribal members is 1,100 (Emm pers. comm.).

The Colony comprises 13.7 acres (as estimated from map provided by Emm pers. comm.) within the city limits of Yerington, Nevada. Land uses at the Colony are a mix of residential and commercial (Emm pers. comm.). YPT also has the off-reservation Arrowhead Market, a gas station and minimarket located on Campbell Lane (Emm pers. comm.).

Campbell Ranch comprises 1,162 acres (as estimated from map provided by Emm pers. comm.) 10 miles north of Yerington. Land uses at the Campbell Ranch are primarily agricultural and residential. Nine assignees farm on private land on the ranch and grow primarily alfalfa and onions. YPT grows alfalfa on 900 acres. A limited number of cattle are also grazed. Campbell Ranch also has residences (Emm pers. comm.).

Tribal members collect culturally significant plants and animals on both the reservation and public land.

YPT has water rights dating to the early 1900s that are used for agricultural purposes. The water rights for the Colony have been transferred to the ranch for irrigation (Emm pers. comm.).

### ***State of Nevada***

#### **Wildlife Management Areas**

The State of Nevada, through NDOW, owns or has long-term leases on more than 116,888 acres of land incorporated into WMAs across the state. The management focus of most WMAs, including both the Alkali Lake and Mason Valley WMAs,

is development of wetland- and waterfowl-related activities, including the use of these areas as public shooting grounds, with all other uses being secondary (Nevada Board of Wildlife Commission 2002). Public uses include bird watching, hiking, fishing, and hunting. Hunting on WMAs includes migratory game bird, upland game bird, furbearer, and big game hunting (Nevada Department of Wildlife 2008).

Two WMAs occur in the study area: Alkali Lake WMA and Mason Valley WMA. These WMAs are described below.

#### *Alkali Lake Wildlife Management Area*

The Alkali Lake WMA is located at the north end of Smith Valley and is approximately 3,448 acres, of which at least 3,000 acres are a playa lake and a small portion is upland habitat. The WMA was once a significant resource when agricultural tailwater from the surrounding fields and meadows and mountain runoff were major sources of water. Now these water sources have dwindled as a result of 20 years of mostly dry water years with reduced snowmelt from the Pine Nut Mountains, and reduced agricultural tailwater caused by changing agricultural practices (such as laser-leveling; sprinkler, rather than flood, irrigation; and other water conservation measures). The WMA has only minor water rights from springs in the Pine Nut Mountains and relies almost solely on drain and return flows. In dry years, the lake is typically dry by the end of the summer. (Bull pers. comm. 2008).

When water is present in Alkali Lake, the playa lake provides wetland habitat and shallow water for a wide variety of shorebirds and wading birds. When wet, the lake is also used by ducks and geese and provides good hunting opportunities. The lake does not support fishing (Bull pers. comm. 2008).

#### *Mason Valley Wildlife Management Area*

The Mason Valley WMA is approximately 13,735 acres and includes 35 water bodies and a fish hatchery. The WMA is open to the public year-round, and seasonal fishing and hunting are permitted. Hunting includes waterfowl, upland birds, and deer. Camping is allowed (Nevada Department of Wildlife 2008, 1; Bull pers. comm. 2008).

Very good fishing for trout, large mouth bass, catfish and bluegill is available at the WMA. Public use of the WMA reaches its highest level during the fishing season, sometimes exceeding 4,000 users per month (Bull pers. comm. 2009).

In addition, approximately 1,200 acres of the WMA are farmed to increase the quantity, quality and variety of wildlife habitat present on the area. Wheat, barley, corn, sorghum, other grain crops, and alfalfa hay are grown (Nevada Department of Wildlife 2008). Livestock grazing is permitted and is used to periodically stimulate green-up, provide succulent feed, and open overgrown

areas for resting and feeding by waterfowl and other wildlife (Nevada Department of Wildlife 2008).

Water is supplied to the Mason Valley WMA from the Walker River, the Fort Churchill Cooling Pond (well water from Nevada Energy [formerly Sierra Pacific Power Company]), the Mason Valley Fish Hatchery (well water), the City of Yerington (treated effluent water), and irrigation wells located on the WMA. The Walker River decreed water rights dedicated to the WMA are some of the earliest priority rights on the river (Bull pers. comm. 2008).

### *Walker Lake*

Walker Lake occupies 35,520 acres (ICF Jones & Stokes 2008) and is managed by the state (Hull pers. comm.) (excluding the portions under the jurisdiction of DOD or WRPT). The lake provides wildlife habitat (Chapter 5, Biological Resources—Fish, and Chapter 6, Biological Resources—Wildlife) and is used for recreational purposes (Chapter 11, Recreation). Wildlife in and around the lake is managed by NDOW.

### **Walker Lake State Recreation Area**

The State of Nevada, through the Division of State Parks, owns and maintains the Walker Lake SRA, located 11 miles north of Hawthorne, off of U.S. Highway 95. The SRA is 273 acres, with 40 of those acres adjacent to the lake and the remainder across the highway. Management of the SRA is guided by the Walker State Recreation Area Master Plan (Nevada State Parks 1989). The goal of this plan is to provide a long-range management and development strategy for the SRA. The plan addresses the day-to-day management of recreational and natural resources. There are no immediate plans to update the Master Plan. Facilities at the SRA are described in Chapter 11, Recreation.

### ***Lyon County***

Lyon County is located in western Nevada and is bounded by Douglas County to the west, Storey and Washoe Counties to the northwest, Churchill County to the northeast, and Mineral County to the east. The Nevada State Demographer's Office estimates the population of Lyon County in 2007 as 55,903, and this population is expected to increase to 105,533 by 2028 (Nevada Small Business Development Center 2008).

Of the 786,012 acres of Lyon County in the project area, only 164,483 acres are under the jurisdiction of the county (ICF Jones & Stokes 2008). The remainder are tribal lands or public lands managed by BLM or USFS.

Approximately 95,932 acres of county land in the study area are in agricultural use (Figure 7-2), although this figure can change annually. Agriculture is

described in more detail later in this chapter in the section entitled Agricultural Lands in the Study Area.

The two main areas of Lyon County in the study area are Mason Valley and Smith Valley. The City of Yerington is the county seat. The remainder of the county located within the study area is described under BLM Lands.

### **Mason Valley**

Mason Valley is a rural farm and ranch community located in the southeastern portion of the county between the Singatse Range and the Wassuk Range. The valley's population in 2006 was 8,740, which includes the City of Yerington and the communities of Mason, Nordyke, and Weed Heights (Lyon County 2006a).

The primary land use in the valley is agriculture (Lyon County 2006b) (Figure 7-3). See Agricultural Lands in the Study Area, below, for more information. Low-density residential is the next most abundant land use type, particularly along the eastern edge of the valley. Substantial blocks of industrial lands on the western edge of the valley (Lyon County 2006b) were used primarily for mining.

There are no active mines in the Walker River Basin portion of Lyon County, but there are several inactive or abandoned mines, including the MacArthur Mine (described above in Bureau of Land Management Lands) and the Anaconda Mine near Yerington (Environmental Protection Agency 2008). The Anaconda Mine is described in Chapter 3, Water Resources. There is also one mine, the Pumpkin Hollow Mine, in the planning stages (Nevada Small Business Development Center 2008, Appendix A), and the City of Yerington is considering leasing water to the mine (Joyner 2008).

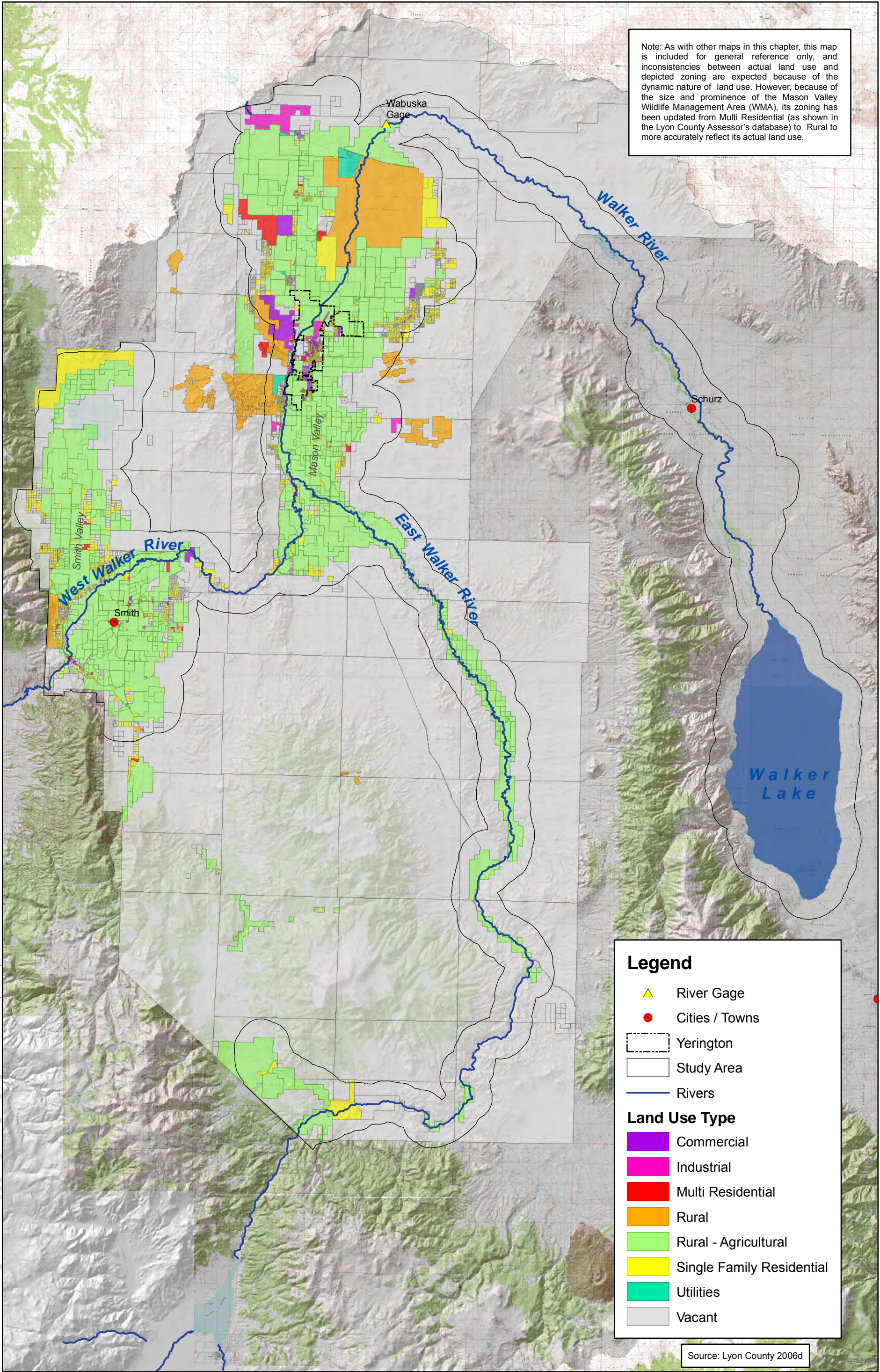
### **Smith Valley**

Smith Valley is a rural farm and ranch community located in the southwestern portion of the county between the Singatse Range and the Pine Nut Mountains and Wellington Hills. The valley's population in 2006 was 1,977, which includes the communities of Wellington, Smith, and Simpson (Lyon County 2006a; Economic Development Authority of Western Nevada 2008).

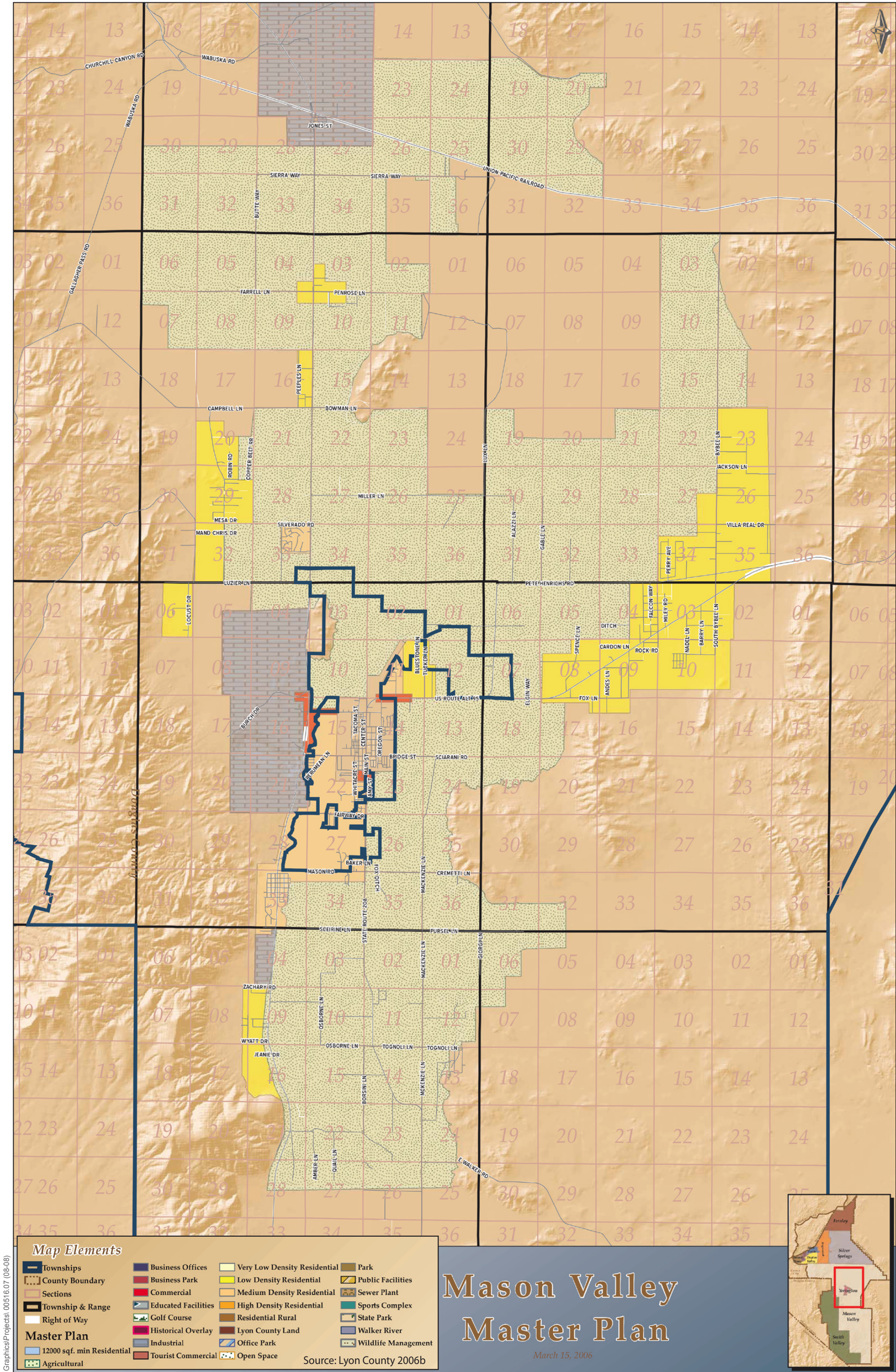
The primary land use in the valley is agriculture (Figure 7-4) (Lyon County 2006c). See Agricultural Lands in the Study Area below for more information.

Low-density residential is the next most abundant land use type, particularly in the unincorporated towns of Smith and Wellington. The valley also has several business parks and industrial zones (Lyon County 2006c).





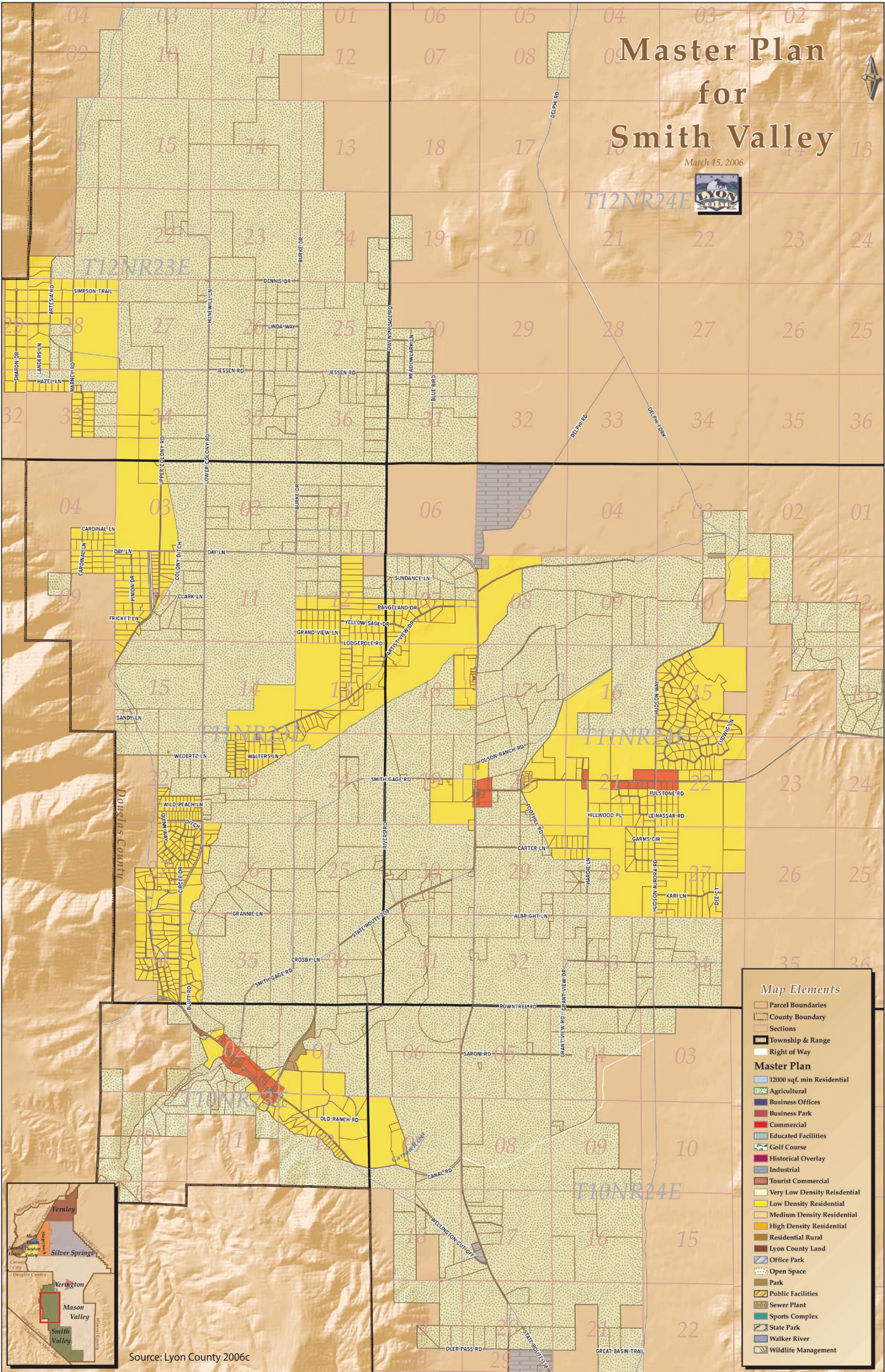




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**Figure 7-3**  
**Lyon County Land Use Zoning Map for Mason Valley**





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**Figure 7-4**  
**Lyon County Land Use Zoning Map for Smith Valley**





### **City of Yerington**

The city of Yerington is located in north central Lyon County on Highway 95A and has an estimated population of 3,319 (Nevada Small Business Development Center 2007). Yerington was incorporated in 1907 and is the county seat. Land uses in the city include agriculture, low- and medium-density residential, commercial, and industrial uses (Lyon County 2006c) (Figure 7-5).

### ***Mineral County***

Mineral County is located in west central Nevada and is bounded by Churchill County on the north, Nye County on the east, Esmeralda County on the south, and Lyon County on the west. The county is 3,700 square miles (Mineral County Regional Planning Commission 2006). The Nevada State Demographer's Office estimated the population of Mineral County in 2007 as 4,377. This population is expected to decrease significantly over the next 20 years (Nevada Small Business Development Center 2008).

Of the 1,011,966 acres of county land in the project area, approximately 34,000 acres are under the jurisdiction of the county (ICF Jones & Stokes 2008). The remainder is tribal land or public lands managed by the BLM or USFS. Approximately 27,042 acres (35,520 acres occupied by Walker Lake plus 1,058 acres of dry land) are in the study area.

Much of the population lives in the county seat of Hawthorne, which is located at the southern end of Walker Lake and has an estimated population of 2,960 (Nevada Small Business Development Center 2007). Land uses in Hawthorne include residential and some commercial and public facilities. The town is almost completely surrounded by the Hawthorne Army Depot, which is discussed under Department of Defense Lands.

Other communities in the study area are the town of Walker Lake, which is located on the western edge of Walker Lake and has an estimated population of 299, and Schurz, which has an estimated population of 711 (Nevada Small Business Development Center 2000).

Mineral County is one of Nevada's oldest mining areas, with gold mines dating back to the Civil War era. Mining, however, is a cyclic industry, and mining activity in the county has been at a low level. Minerals typically mined in Mineral County are silver, gold, tungsten, lead, and zinc (Mineral County Regional Planning Commission 2006).

### ***Agricultural Lands in the Study Area***

Agriculture is an important land use in the valleys of Walker Basin. The largest agricultural areas in the study area, Mason Valley and Smith Valley, are both in Lyon County (Table 7-1).

In Mason Valley, the predominant crop is alfalfa, and other important crops include onion, corn, and turf (Bonnenfant et al. 2009) (Table 7-2). Other agricultural industries include feedlots and dairies (Lyon County 1990).

In Smith Valley, alfalfa is the predominant crop grown in the valley (Bonnenfant et al. 2009) (Table 7-2). Other agricultural industries include cattle ranching, feedlots, and dairies (Lyon County 1990; Economic Development Authority of Western Nevada 2008).

**Table 7-1.** Average Irrigated Land in the Study Area by County

County	Acres in Agriculture
Lyon	
Mason Valley	51,973
Smith Valley	35,432
East Walker <sup>a</sup>	5,593
Total <sup>b</sup>	95,932
Mineral	7,850
Total	103,783

Source: ICF Jones & Stokes 2008.

Note: Acreages are based on the GAP analysis 1990 to 1997 and California Department of Water Resources 2001. Acreages change annually.

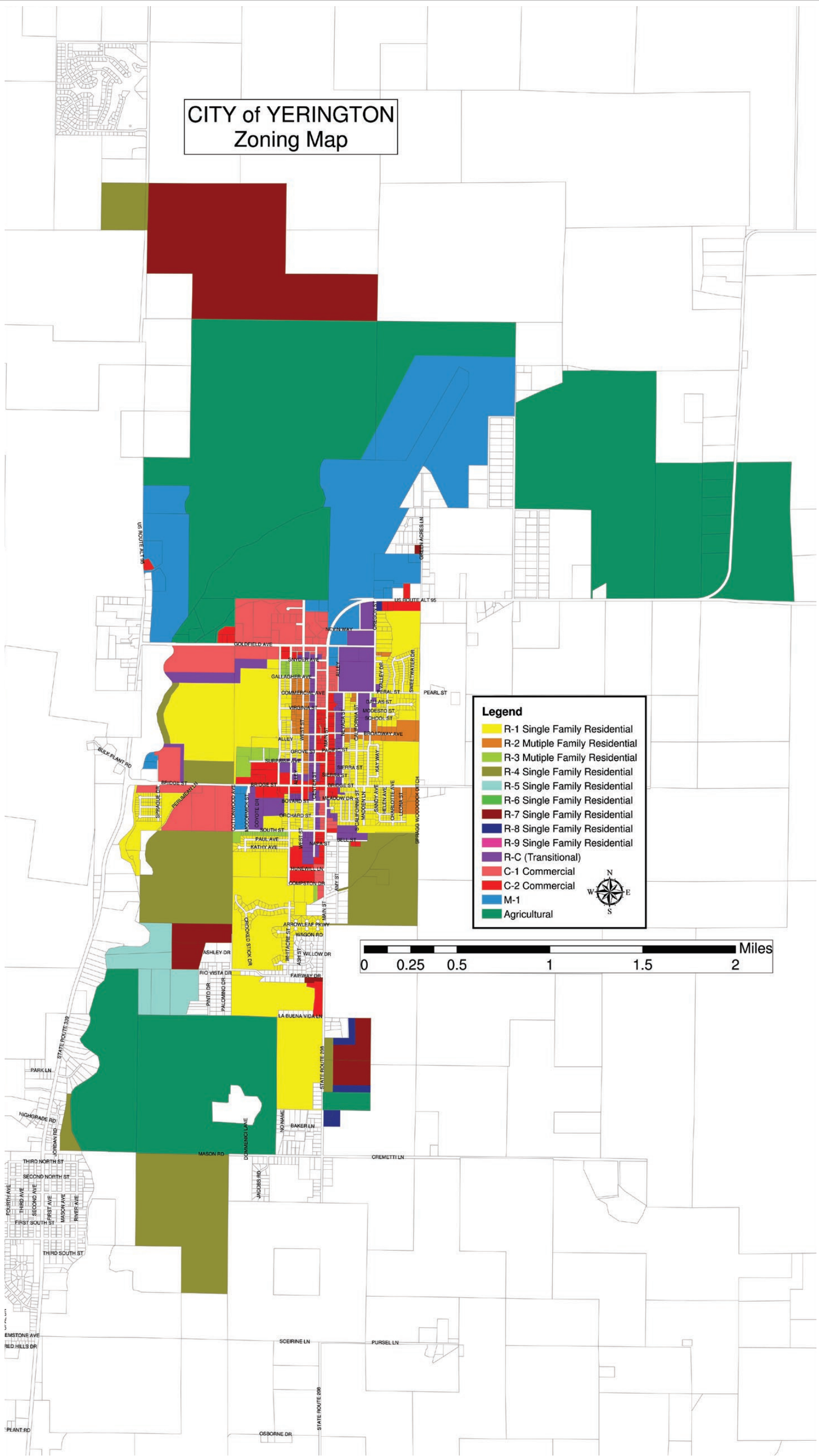
<sup>a</sup> Does not include upper portion of East Walker River.

<sup>b</sup> Total for county, including upper portion of East Walker.

Recent crop information from DRI for Mason and Smith Valleys is presented in Table 7-2. In both valleys, more than half of the cultivated land is planted in alfalfa. Other important crops are onion and corn in Mason Valley and pasture and grass in Smith Valley. Some agricultural land is also fallowed.

As described in the soil discussion provided in Chapter 8, Air Quality, most soils in the study area are suited for agriculture. In addition, some soils in the study area meet the requirements for prime farmland (i.e., land best suited for producing feed, forage, and oilseed crops) (Archer 1984, Natural Resources Conservation Service 2006). It is important to note that all farmland in Nevada is, at a minimum, classified as land of statewide importance.







**Table 7-2.** Cropping Patterns for Mason and Smith Valleys in 2007

Crop Type	Total Acres	Percentage of Valley
<b>Mason Valley</b>		
Alfalfa	25,942	68
Brush	347	0.9
Corn	1,891	5
Dry grass	107	0.3
Fallow	3,065	8
Forage crop	816	2
Feed lot	31	0.1
Grass	777	2
Garlic	213	0.6
Grapes	8	0
Grain	841	2
Lettuce	249	0.7
Onion	2,445	6.4
Oats	104	0.3
Pasture	1,064	2.8
Turf	260	0.7
Total	38,159	100.00
<b>Smith Valley</b>		
Alfalfa	11,404	56
Brush	43	0.2
Fallow	3,312	16
Feed lot	107	0.5
Grain	160	0.8
Grass	1,965	9.6
Garlic	159	0.77
Pasture	3,411	17
Total	20,400	100.00

Source: Bonnenfant et al. 2009.

Note: Acres planted vary from year, particularly the number of acres fallowed.

## Environmental Consequences

This section describes the impact analysis relating to land use and agriculture for the acquisition alternatives and the No Action Alternative. It also lists the criteria used to conclude whether an impact would be adverse or beneficial.

### Assessment Methods

For land use and agriculture impacts, the acquisition alternatives and No Action alternative were qualitatively compared to existing land uses, planned land uses, and known trends in the study area.

For agricultural impacts, the estimated potential reduction in irrigated land that could result from implementation of the Acquisition Program is summarized in Table 7-3. Details of the estimates are described in Chapter 3, Water Resources. These acreages are in addition to land already being fallowed in the study area.

The potential fate of the involved lands differs by acquisition alternative. For Alternative 1 (Purchase Alternative), willing sellers of land, water appurtenant to the land, and related interests are typically offering for sale appurtenant water rights and related interests. (This is more fully described in Chapter 2, Alternatives.) Once the water rights are permanently transferred, the associated lands that currently are irrigated could be retired from agricultural production or be converted to other uses. However, it is also possible that some sellers may maintain their lands in agriculture by engaging in activities that do not require irrigation (e.g., dry land grazing) or by transferring water rights from another parcel. Some sellers may offer some but not all of their water rights.

For Alternative 2 (Leasing Alternative), water leases would be temporary and affected lands would not be expected to be permanently removed from agricultural production. It is assumed that, in the implementation of Alternative 2, landowners would not repeatedly lease their water from the same parcel beyond the expected 1- to 3-year lease period. However, lands are expected to be fallowed during the lease period, and the overall reduction in irrigated acreage would be similar to that for Alternative 1.

It is not certain how many acres of land would cease irrigated agricultural production as a result of implementing Alternatives 1 or 2. For the purposes of this analysis, however, the impacts were based on the Partial Consumptive Use analysis described in Chapter 2, Alternatives, and in Chapter 3, Water Resources (i.e., 33% each in Mason Valley, Smith Valley, and East Walker). It is expected that permanent acquisition of water rights would lead to retirement from agriculture of a substantial portion of the involved lands. Retirement is considered a land use change.

With Alternative 3 (Efficiency Alternative), water would be acquired through the implementation of water conservation and efficiency measures and lands involved in on-farm efficiency measures would be expected to continue practicing irrigated agriculture.

Other assumptions of the impact analysis are identified below.

- A policy conflict has no magnitude (i.e., either a policy conflict exists or it does not). As indicated in the impact criteria section below, an environmental impact that conflicts with adopted land use policies leads to a determination of an adverse impact.
- Incompatible land uses do have magnitude (i.e., a greater amount of land with incompatible uses is a greater impact). Also indicated below, environmental impacts that are incompatible with uses of adjacent lands are considered to be adverse impacts.

**Table 7-3.** Estimated Impacts on Irrigated Land

	Alternative 1 <sup>a</sup>		Alternative 2 <sup>a</sup>		Alternative 3 <sup>c</sup>
	Full Transfer Scenario	Partial Consumptive Use Scenario	Full Transfer Scenario	Partial Consumptive Use Scenario	75% Water-Use Efficiency
<b>Maximum Reduction in Irrigated Land (percent)<sup>b</sup></b>					
East Walker	27	33	27	33	0
Smith Valley	24	33	24	33	0
Mason Valley	27	33	27	33	0
Weighted Average 26		33	26	33	0
<b>Maximum Reduction in Irrigated Land (acres)<sup>b</sup></b>					
East Walker	1,100	1,300	1,100	1,300	0
Smith Valley	4,200	5,800	4,200	5,800	0
Mason Valley	9,500	11,500	9,500	11,500	0
Weighted Average 1	4,800	18,600	14,800	18,600	0

**Notes:**

Many assumptions were used in generating these estimates. See Chapter 3, Water Resources, for a description of the assessment methods.

<sup>a</sup> For Alternatives 1 and 2, it was assumed that the amount of money available would be sufficient to fully fund the alternative.

<sup>b</sup> Estimated reduction in irrigated land assumes no increase in water-use efficiency.

<sup>c</sup> Water savings assume no change in crop evapotranspiration, as could result from crop switching.



The quality of farmland that could be affected by the project will be addressed in a programmatic Land Evaluation and Site Assessment (LESA) analysis, which will be prepared in accordance with the Farmland Protection Policy Act (FPPA) (see Appendix 1D, Regulatory Information). This analysis will be provided to NFWF along with this Revised DEIS. (For further discussion, see Impact LU-1, below.)

### **Impact Criteria**

Impacts on land use would be considered adverse if implementation of the acquisition alternatives or No Action alternative would:

- physically divide an established community or be incompatible with adjacent land uses in the short or long term;
- conflict with any applicable land use plan, policy, or regulation (e.g., a general plan or zoning ordinance) that has been adopted by an agency with jurisdiction in the study area;
- conflict with proposed or approved development plans or adopted zoning; or
- convert existing agricultural land to nonagricultural use or impair its agricultural productivity.

An impact was considered beneficial if it resulted in an increase in agricultural productivity.

### **Impacts**

#### ***No Action Alternative***

The population in Lyon County is expected to grow, even in the more rural southern portion of the county located in the study area. One factor affecting growth would be growth in industry, such as the opening of the Pumpkin Hollow Mine. Population growth could change land use in Lyon County because increases in population sometimes create pressure to develop agricultural land. In addition, according to the Planning and Issues Opportunities paper written for the Comprehensive Master Plan update (Lyon County 2007):

Many younger generation people are opting to not continue farming and ranching. Many of the younger generation commute to work to Douglas and Washoe counties and to Carson City. This trend may contribute to potentially declining and changing agricultural lands in the county, and may eventually occur more in the Smith and Mason Valleys.

The plan also presents the intention of the county to retain agriculture and the rural feel of Smith and Mason Valleys as much as possible. Nevertheless, conversions have occurred in the past, and some amount of land would be

expected to convert from agriculture to other uses, such as commercial or residential, but there are no known estimates for the study area of future agricultural land use conversion.

Despite growth pressures in the portion of Lyon County located in the study area, under the No Action Alternative agriculture would continue to be an important part of the economy and culture.

As described in the Affected Environment, the population in Mineral County is expected to continue to decrease. A population decrease could be expected to reduce the number of occupied residences and commercial businesses. Use of public facilities would also be expected to decline.

Under the No Action Alternative, land use conditions at the Walker Lake SRA would also be expected to decline as the lake elevation continues to drop.

Other currently unknown land uses changes unrelated to the Acquisition Program also could occur in the future on BLM, USFS, DOD, WMAs, YPT, or WRPT lands, but no specific changes are anticipated.

### ***Alternative 1 (Purchase Alternative)***

Water rights acquired under Alternative 1 are expected to add an average inflow of 50,000 af/yr of water to Walker Lake. It is possible, however, that less than the average 50,000 af/yr would be provided to the lake either because of funding limitations or because there would not be enough willing sellers. With funding of \$56 million, it is estimated that average inflow to the lake would increase by 7,300 af/yr.

The analysis of impacts under Alternative 1 assumes that the Purchase Alternative would be fully funded and that water rights acquired would increase the average inflow to the lake by 50,000 af/yr. Unless otherwise noted, if acquisitions were limited to those achievable only with the funding of \$56 million, the impacts would be similar in nature (i.e., adverse, minor, beneficial, or no impact) but of less magnitude.

### **Direct Impacts**

#### ***Impact LU-1: Conflict with Requirements of the Farmland Protection Policy Act (No Impact)***

Under Alternative 1, it is anticipated that most acquisitions would involve agricultural land, which could lead to a reduction in the number of acres in agricultural use in the study area. If sufficient appurtenant water is sold from the land, the land could be taken out of agricultural use, possibly resulting in retirement of that land or conversion to other uses (Table 7-3). This retirement or conversion would affect prime farmland and farmland of statewide importance in the study area, primarily in Mason, Smith, and East Walker Valleys. A

programmatic LESA analysis in accordance with FPPA is being developed for Mason, Smith, and East Walker Valleys, and the impacts of Alternative 1 on these areas will be provided to NFWF as well as the Revised DEIS. FPPA does not require that an agency modify its project to protect farmland, only that it evaluate the impacts and consider alternatives. Therefore, the Purchase Alternative would not conflict with requirements of FPPA. There would be no impact.

There would be no conflict with either full funding or funding of \$56 million acquisition scenarios.

*Impact LU-2: Conflict with Lyon County and City of Yerington Land Use Policies (Adverse Impact)*

Under Alternative 1, the number of acres in agriculture would likely be reduced as a result of land retirement (i.e., land being taken out of agriculture) or conversion caused by acquisition of land, water appurtenant to the land, or related interests (see Table 7-3 and its preceding discussion).

The majority of acquisitions are expected to occur in Lyon County. This land use change would conflict with the agricultural preservation policies of the Lyon County Master Plan (See Appendix 1D, Regulatory Information) and with the City of Yerington land use zoning map (Figure 7-5). This land use change would be an adverse impact.

This conflict would occur with either full funding or funding of \$56 million acquisition scenarios.

*Impact LU-3: Conflict with Lyon County Master Plan Policies on Retaining Water Resources (Adverse Impact)*

Under Alternative 1, water rights would be acquired and exported outside the county to Walker Lake in Mineral County (Table 7-3). This exportation would conflict with Lyon County Conservation and Natural Resources Goal 1 on retaining water resources within the county (see Appendix 1D, Regulatory Information). This conflict would be an adverse impact.

This conflict would occur with either full funding or funding of \$56 million acquisition scenarios.

*Impact LU-4: Affect Productivity of Irrigated Agricultural Land (Adverse Impact)*

Under Alternative 1, it is anticipated that most acquisitions would involve agricultural land, which would lead to a reduction in the amount of water applied to agricultural lands in the study area (see Table 7-3 for maximum acres that could be affected). This reduction would impair agricultural productivity in the study area.

Agricultural productivity is equal to *agricultural output* (e.g., yield) minus the *agricultural input* (e.g., labor, capital, materials, including water) (U.S.

Department of Agriculture 2009). On active agricultural properties where water rights for irrigation are sold, agricultural production would either cease, be replaced by dry land agriculture (e.g., used as dry pasture), or be sustained by transferring water rights (e.g., a primary groundwater right) from another parcel. As a result, agricultural productivity would decline on the land involved with the acquisition, except in the last case, which is expected to occur rarely because there are considerable prerequisites that must be met to complete a transfer. (See Chapter 3, Water Resources, for a discussion of transference of primary groundwater rights.) Given the scale of the Purchase Alternative and the likelihood that land would be retired, overall agricultural productivity is expected to decrease in the study area, primarily in the Mason, Smith, and East Walker Valleys. This would be an adverse impact.

The adverse nature of this impact would be the same with either full funding or funding of \$56 million acquisition scenarios, but the magnitude of the impact is expected to be proportional to the amount of allocated funding.

*Impact LU-5: Comply with Land Use Goals in the Mineral County Master Plan (Beneficial Impact)*

Under Alternative 1, the average increased inflow of 50,000 af/yr of water would improve conditions at Walker Lake. This improvement would support goals in the Mineral County Master Plan to preserve and improve outstanding natural, historic, or scenic features in the county and to restore health and functioning to the county's natural resources (see Appendix 1D, Regulatory Information). This would be a beneficial impact.

It is estimated that acquisitions limited to funding of \$56 million would increase average inflows to Walker Lake by approximately 7,300 af/yr. This increase would be insufficient to significantly improve the ecology of the lake, but it would begin the process of reversing the lake's decline. The funding of \$56 million would not by itself achieve Mineral County's goals as they apply to Walker Lake, but it would contribute toward those goals to a greater degree than the No Action Alternative.

## **Indirect Impacts**

*Impact LU-6: Create Incompatible Land Uses as a Result of Invasive Plant Species Colonization on Retired Agricultural Land (Adverse Impact)*

Under Alternative 1, land, water appurtenant to the land, or related interests would be acquired, and agricultural land could be retired or converted to nonagricultural uses. If invasive plant species were allowed to extensively colonize the retired or converted land, this would threaten or actually cause the spread of these weeds to adjacent lands. (See Chapter 4, Biological Resources—Vegetation and Wetlands, for a discussion of invasive plants.) It is unknown exactly how lands involved in acquisitions would be managed after the sales are complete. However, it is expected that invasive plants could colonize retired

land. Invasive plant colonization on lands involved in acquisitions would constitute a land use that is incompatible with adjacent crop production. This would be an adverse impact.

The adverse nature of this impact would be the same with either full funding or funding of \$56 million acquisition scenarios, but the magnitude of the impact is expected to be proportional to the amount of allocated funding.

### ***Alternative 2 (Leasing Alternative)***

Because Alternative 2 requires recurring water leases, the actions of Alternative 2 would last only until the funding is exhausted. Assuming that sufficient water is leased to increase inflow to Walker Lake by an average 50,000 af/yr, the funding of \$56 million would last an estimated 3 years, while full funding would last an estimated 20 years.

Unless otherwise noted, the impacts of Alternative 2 would be similar in magnitude (i.e., adverse, minor, beneficial, or no impact) to those of Alternative 1, only temporary.

### **Direct Impacts**

#### *Direct Impacts Similar to Alternative 1*

##### *Impact LU-1: Conflict with Requirements of the Farmland Protection Policy Act (No Impact)*

Alternative 2 poses no potential for conflict with the FPPA because the FPPA applies only to projects that would convert farmland to nonagricultural uses (Appendix 1D, Regulatory Information). Under Alternative 2, appurtenant water would be leased from any particular parcel for only short periods of time as determined by the landowner and the parameters of the leasing program, and it is expected the land would remain in agricultural use. Therefore the FPPA would not apply. There would be no conflict with the FPPA and no impact.

There would be no conflict with either full funding or funding of \$56 million acquisition scenarios.

##### *Impact LU-3: Conflict with Lyon County Master Plan Policies on Retaining Water Resources (Adverse Impact)*

Under Alternative 2, the leasing program would be temporary. Whereas Alternative 1 would involve the permanent transfer of water rights to benefit Walker Lake, Alternative 2 would involve increased amounts of water leaving Lyon County for a limited period of time. Accordingly, the leasing program's conflict with Lyon County's policy on water resources (Appendix 1D, Regulatory Information) would also be temporary (ranging from 3 to 20 years, depending on available funding). This would be an adverse impact but temporary.



This conflict would occur with either full funding or funding of \$56 million, but the duration of the conflict would be proportional to the amount of funding.

*Impact LU-4: Affect Productivity of Irrigated Agricultural Land (Adverse Impact)*

Under Alternative 2, it is anticipated that most acquisitions would involve agricultural land, which would lead to a reduction in the amount of water applied to agricultural lands in the study area. This reduction would impair the agricultural productivity of the land for the duration of the lease because it is expected that most land would be fallowed (see Table 7-3 for maximum acres that could be affected). The decrease would be an adverse impact.

The individual properties directly affected would change as fallowed land is brought back into production at the end of a lease and new leases are acquired on other lands. However, the impact in the study area would be similar in magnitude to that for the fully funded Alternative 1, for the duration of the leasing program.

The adverse nature of the impact would be the same with either full funding or funding of \$56 million of the Leasing Alternative, but the magnitude of the impact is expected to be proportional to the amount of allocated funding.

*Impact LU-5: Comply with Land Use Goals in the Mineral County Master Plan (Beneficial Impact)*

Under Alternative 2, an additional average inflow of 50,000 af/yr of water could be delivered to Walker Lake for the duration of the leasing program. Over an extended period of time such as 20 years, this water would substantially improve conditions at Walker Lake. This improvement would support goals in the Mineral County Master Plan to preserve and improve outstanding natural, historic, or scenic features in the county and to restore health and functioning to the county's natural resources (Appendix 1D, Regulatory Information). This would be a beneficial impact.

With funding of \$56 million, however, a 3-year leasing program would produce only slight benefit to Walker Lake compared to existing conditions and only slight progress toward these Mineral County goals. Nevertheless, it would provide some benefit compared to existing conditions and greater compliance with the Mineral County goals than the No Action Alternative.

*Impact LU-6: Create Incompatible Land Uses as a Result of Invasive Plant Species Colonization on Retired Agricultural Land (Adverse Impact)*

Under Alternative 2, irrigation water would be leased, which could result in the cessation of agricultural production for the duration of the lease. If invasive plant species were allowed to establish on that land and spread unchecked to adjacent and nearby agricultural fields, this would create an incompatible land use. It is unknown exactly how lands involved in acquisitions would be managed, but invasive plants could colonize fallowed land. Invasive plant colonization on lands

involved in acquisitions would constitute a land use that is incompatible with adjacent crop production. This would be an adverse impact.

The adverse nature of the impact would be the same with either full funding or funding of \$56 million, but the magnitude of the impact is expected to be proportional to the amount of allocated funding.

*Direct Impacts Different from Alternative 1*

Direct impacts of Alternative 2 that differ from those of Alternative 1 in important ways are discussed in more detail below.

*Impact LU-2: Conflict with Lyon County and City of Yerington Land Use Policies (No Impact)*

Under Alternative 2, there likely would be no change in land use, and therefore Alternative 2 would not conflict with Lyon County or Yerington land use policies (Appendix 1D, Regulatory Information). As indicated previously, it is assumed that Alternative 2 would be implemented in such a manner that landowners would not repeatedly lease the water for the same parcel for an extended number of years and thereby effectively retire the land. Thus, no change in land use is expected under this alternative because water would be leased for only a limited number of years and the land would then be returned to agricultural production. Alternative 2 would not conflict with Lyon County and Yerington land use policies. There would be no impact.

There would be no conflict with either full funding or funding of \$56 million.

**Alternative 3 (Efficiency Alternative)**

Full implementation of Alternative 3 would yield an average inflow of 32,200 af/yr to Walker Lake. Unless otherwise noted, the impacts of Alternative 3 would be similar in nature (i.e., adverse, minor, beneficial, or no impact) to those of Alternative 1, but of less magnitude.

**Direct Impacts**

*Direct Impacts Similar to Alternative 1*

Direct impacts under Alternative 3 that would be similar to those under Alternative 1 are discussed below.

*Impact LU-1: Conflict with Requirements of the Farmland Protection Policy Act (No Impact)*

Alternative 3 poses no potential for conflict with the FPPA because the FPPA applies only to federal projects that would convert farmland to nonagricultural uses (Appendix 1D, Regulatory Information). Under Alternative 3, efficiency measures would make irrigation water supplies available for acquisition but the

land would remain in agricultural production. Therefore, the FPPA would not apply. There would be no conflict with the FPPA and no impact.

*Impact LU-3: Conflict with Lyon County Master Plan Policies on Retaining the County's Water Resources (Adverse Impact)*

Although Alternative 3 would enable sellers to maintain agricultural production, substantially more water would leave Lyon County to benefit Walker Lake than under existing conditions or under the No Action Alternative. This would conflict with Lyon County Conservation and Natural Resources Goal 1 for retaining the county's water resources within the county (Appendix 1D, Regulatory Information). This conflict would be an adverse impact.

*Impact LU-5: Comply with Land Use Goals in the Mineral County Master Plan (Beneficial Impact)*

Increased average inflows of 32,200 af/yr would improve conditions at Walker Lake. This improvement would support goals in the Mineral County Master Plan to preserve and improve outstanding natural, historic, or scenic features in the county and to restore health and functioning to the county's natural resources (Appendix 1D, Regulatory Information). This would be a beneficial impact.

*Direct Impacts Different from Alternative 1*

Indirect impacts of Alternative 3 that differ from those of Alternative 1 in important ways are discussed below.

*Impact LU-2: Conflict with Lyon County and City of Yerington Land Use Policies (No Impact)*

Under Alternative 3, there likely would be no change in land use, and therefore Alternative 3 would not conflict with Lyon County or Yerington land use policies (Appendix 1D, Regulatory Information). No change in land use is expected under this alternative because water would be acquired through conservation and the land would continue to be in agricultural land use. There would be no impact.

*Impact LU-4: Affect Productivity of Irrigated Agricultural Land (No Impact)*

Under Alternative 3, land involved in on-farm efficiency measures would remain productive. The impact of the alternative depends on whether water would be conserved by improving system efficiencies or on-farm efficiencies, and whether on-farm efficiency would be improved by crop switching or increased water efficiency using the same crops. For on-farm water efficiency measures, agricultural productivity could increase if the agricultural output (e.g., yield) remained the same or declined only slightly while agricultural inputs are substantially decreased (by the reduction in water applied). However, because of the uncertainties related to how water would be conserved (i.e., system efficiencies vs. on-farm efficiencies and crop switching versus water efficiency), this is considered to be no impact.

## **Indirect Impacts**

### *Indirect Impacts Different from Alternative 1*

Indirect impacts of Alternative 3 that differ from those of Alternative 1 in important ways are discussed below.

#### *Impact LU-6: Create Incompatible Land Uses as a Result of Invasive Plant Species on Retired Agricultural Land (No Impact)*

Under Alternative 3, land involved in on-farm efficiency measures would remain in agricultural production. It is expected that land use practices would be similar to existing practices and that invasive plant species would not be allowed to establish on the land and spread unchecked to adjacent agricultural fields. Land use would be compatible with adjacent crop production. There would be no impact.