

RECLAMATION

Managing Water in the West

Carson River Floodplain Rehabilitation and Habitat Restoration Project

Environmental Assessment LO-2014-1014



U.S. Department of the Interior
Bureau of Reclamation
Lahontan Basin Area Office
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Carson City, Nevada 89701

Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Acronyms and Abbreviations

APE	Area of Potential Effect
AQI	Air Quality Index
ATV	All-terrain Vehicle
BMP	Best Management Practice
BLM	Bureau of Land Management
CWSD	Carson Water Subconservancy District
CFR	Code of Federal Regulations
DVCD	Dayton Valley Conservation District
DTL	Desert Terminal Lakes (Program)
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
GPS	Global Positioning System
GLO	General Land Office
HCP	Habitat Conservation Plan
ITA	Indian Trust Asset
LBAO	Lahontan Basin Area Office
NDA	Nevada Department of Agriculture
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
NHPA	National Historic Preservation Act
NNHP	Nevada Natural Heritage Program
NRCS	Natural Resources Conservation Service
NTIR	National Trails Intermountain Region
NVCRIS	Nevada Cultural Resource Information System
OHV	Off-highway Vehicle
OBEC	Otis Bay Ecological Consultants, Inc.
PM	Particulate Matter
PPE	Personal Protective Equipment
Reclamation	U.S. Bureau of Reclamation
SERA	Syracuse Environmental Research Associates, Inc.
SHPO	State Historic Preservation Office
TES	Threatened, Endangered, Sensitive (species)
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

Chapter 1 – Purpose and Need

1.1 Introduction

This Environmental Assessment (EA) was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 United States Code (USC) 4321–4347), Council on Environmental Quality (CEQ) regulations for implementing the procedural requirements of NEPA (40 Code of Federal Regulations (CFR) §1500–1508), and Department of the Interior NEPA regulations (43 CFR §46). This document provides an assessment of the potential impacts to the human environment associated with allowing the use of federal grant funding by the Dayton Valley Conservation District (DVCD) for controlling weeds and restoring native and desirable vegetation on public and private lands along the Middle Carson River, Nevada. The restoration funds would be provided via a sub-grant from the National Fish and Wildlife Foundation (NFWF); the original grant funding source is the U.S. Bureau of Reclamation's (Reclamation) Desert Terminal Lakes (DTL) Program.

1.2 Project Location

The proposed project is located on 12 properties within the Middle Carson River floodplain in Lyon County, Nevada. The properties extend from approximately 1.5 miles southwest of Dayton, Nevada, downstream to about 2.6 miles west of Fort Churchill State Historic Park (Figures 1–5; note that the 12 parcel identification numbers are not consecutive). Proposed treatment parcels within these properties are located on the north and south sides of the river. All but two of the parcels are within the Carson Plains hydrologic subbasin, which is bound on the south by the Pine Nut Mountains and on the north and northwest by the Virginia Range (Maurer 2011). The other two easternmost parcels (19 and 20) are situated within a low elevation, narrow pass at the north end of the Pine Nut Mountains. Elevations within the project area range from 4,265 to 4,320 feet (ft) above mean sea level. The privately-owned Upper Cardelli Ditch, a Carson River irrigation diversion canal, runs along the northern edges of parcels 1–10. The Koch (Chaves) Ditch diverts water from the Carson River just east of Parcel 10a and runs along the eastern edges of Parcels 19 and 20 (Drews and Branch 2015).

1.3 Proposed Action

The proposed action is to allow DVCD to use NFWF sub-grant funding to control noxious and invasive weeds and to restore native and desirable vegetation on 12 parcels (451 acres total) within the floodplain of the Middle Carson River (Figures 1–5). Weed treatment priorities are based on non-native, noxious, and invasive weed species listed on the Nevada Noxious Weed List (Nevada Department of Agriculture (NDA) 2015a).

Treatments would consist of various combinations of mowing to remove decadent vegetation and stimulate weed growth (to enhance herbicide uptake), herbicide application to control weeds, and drill and broadcast seeding to establish native and desirable vegetation. Parcels would be inventoried and mapped for longer-term habitat monitoring. Proposed treatment parcels include privately-owned active and retired agricultural lands (farms and ranches; 359 acres) and Lyon County Open Space lands (92 acres). DVCD would obtain right-of-entry authorizations from willing private landowners.

1.4 Need for the Proposed Action

Several documents about or associated with the Carson River emphasize the importance of controlling noxious and invasive weeds in the floodplain. For example, a 2008 report assessing the Middle Carson River points out the ecological adverse impacts of noxious and undesirable weeds on riparian communities, including floodplain reaches containing the proposed treatment parcels (Otis Bay Ecological Consultants (OBEC) 2008). This report recommends implementing a weed management plan.

The Middle Carson River Habitat Conservation Plan (HCP) also notes that weed infestation is a significant problem along much of the Middle Carson River (JBR Environmental Consultants 2012). The HCP describes the impact of weeds on the decline of riparian forests and native species diversity by displacement. A principal goal of the HCP is to improve overall habitat conditions on the Middle Carson River within Nevada Division of State Parks and Lyon County Open Space lands, with an emphasis on maintaining and enhancing riparian vegetation. The HCP recommends treatments to control weeds and establish desirable forb and grass species.

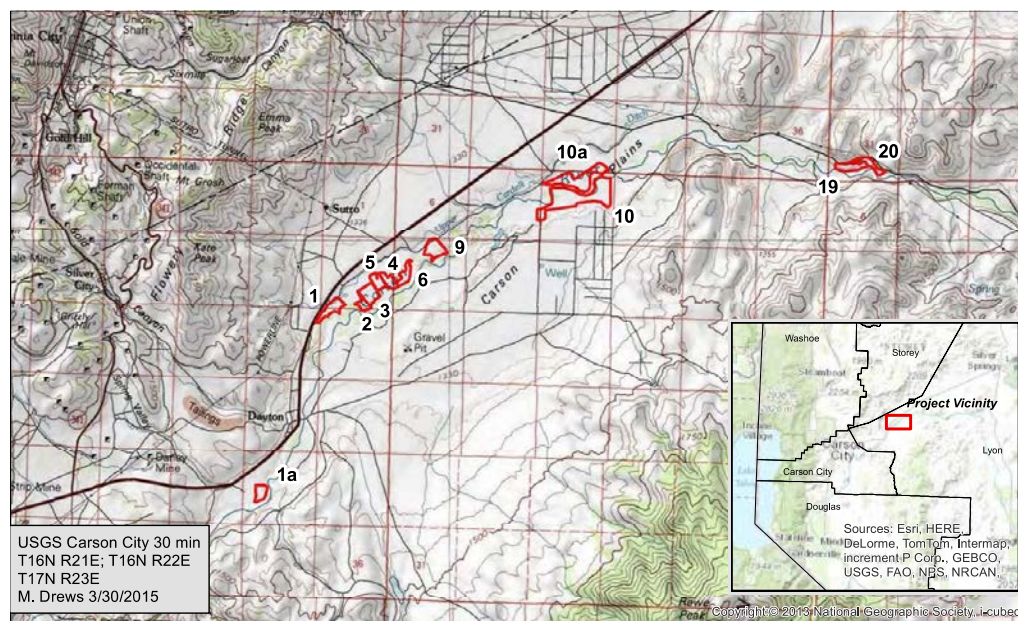
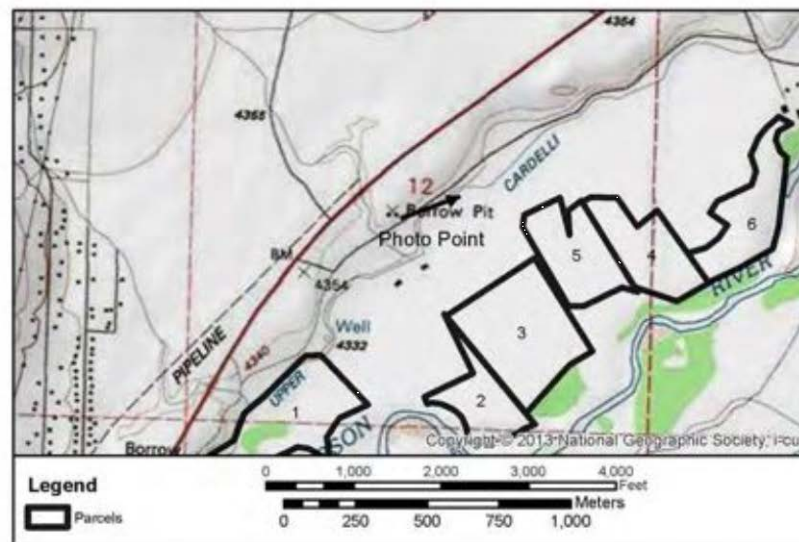
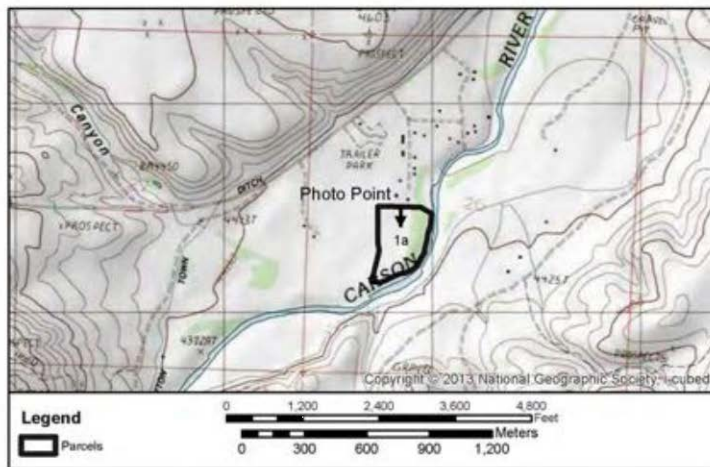


Figure 1. Project Area Map of Dayton Valley Conservation District's 12 Parcels.



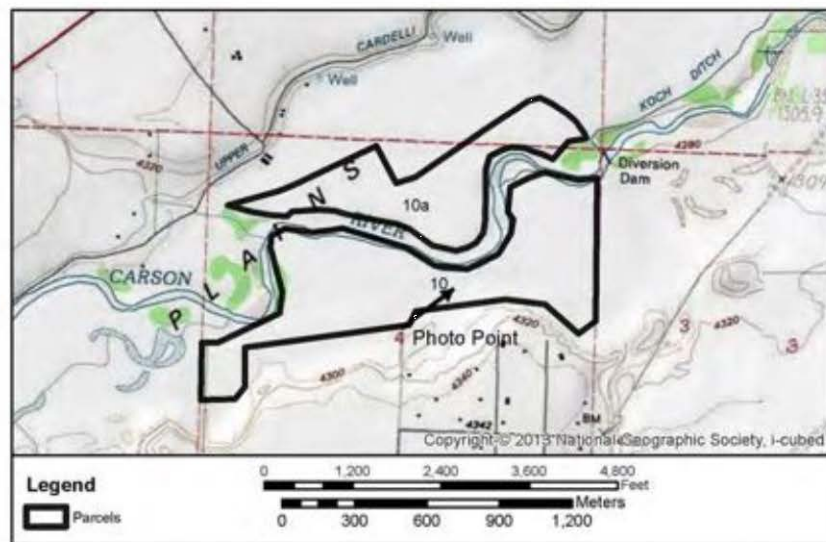
Project Area View East from River Road. Cardelli Ditch in Foreground.

Figure 2. Project Area View: Parcels 1–6.



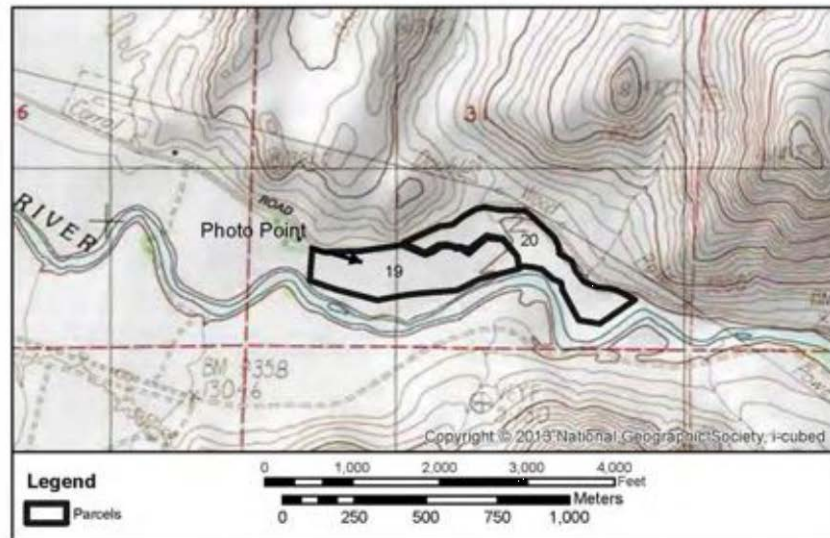
Project Area View South at Santa Maria Park

Figure 3. Project Area View: Parcel 1a.



Project Area Parcel 10 View Northeast.

Figure 4. Project Area View: Parcels 10 and 10a.



Project Area View East from Fort Churchill Road.

Figure 5. Project Area View: Parcels 19 and 20.

The final report for the Carson River Stream Bank Restoration and Stabilization Project (Carson Water Subconservancy District (CWSD) 2012) discusses the role of invasive and non-native weeds in reducing river bank stability and increasing soil erosion and stream sedimentation, which adversely affects the river's water quality. The report singles out perennial pepperweed (tall whitetop, *Lepidium latifolium*), Russian knapweed (*Acroptilon repens*), and tamarisk (salt cedar, *Tamarix ramosissima*) as particularly prolific and highly competitive invasive species. The report states that protecting the remaining cottonwood (*Populus* spp.) gallery forests and riparian habitat along the Carson River is a top priority in the watershed.

The Nevada Wildlife Action Plan (Nevada Department of Wildlife (NDOW) 2012) notes that noxious weeds may be one of the greatest negative change agents in Nevada's riparian ecosystems. Noxious and invasive weeds downstream of Dayton on the Carson River are specifically mentioned, as is the ability of perennial pepperweed and tamarisk to convert entire landscapes to undesirable monocultures.

The DVCD, along with partners and cooperators, has implemented a series of projects on the Middle Carson River designed to restore floodplain riparian habitat (Wilkinson 2014; CWSD 2015a; see section **3.13 Cumulative Impacts** below). However, large reaches of the floodplain are still dominated by non-native, noxious, and invasive weeds. Successfully controlling the target weed species and replacing them with native and desirable vegetation would be a major step in restoring the riverine ecosystem. The proposed action would provide important follow up treatments for some parcels that were previously treated and initial treatments for other parcels.

1.5 Purpose of the Environmental Analysis

The purpose of this EA is to describe the environmental consequences of allowing NFWF to provide federal DTL Program sub-grant funding to the DVCD for restoration of 451 acres of Middle Carson River floodplain habitat by controlling non-native, noxious, and invasive weeds and establishing native and desirable vegetation.

1.6 Legal and Statutory Authorities Relevant to the Proposed Federal Action

Reclamation has provided grant funds to NFWF through Public Law 107–171, as amended by Public Law 110–246, Section 2807; Public Law 111–85, Section 207; and Public Law 112–74, Title II, Division B, Section 208(a) for the following authorized uses:

Public Law 107–171, as amended, Section 2507 DESERT TERMINAL LAKES.

(b) PERMITTED USES. For the benefit of at-risk natural desert terminal lakes and associated riparian and watershed resources, in any case in which there are willing sellers or willing participants, the fund described in subsection (a) may be used –

- (1) to lease water;
- (2) to purchase land, water appurtenant to the land, and related interests; and
- (3) for efforts consistent with researching, supporting, and conserving fish, wildlife, plant, and habitat resources.

In addition to NEPA and Public Law 107–171, actions of Reclamation are guided by a number of other statutes, regulations, and agreements including:

- Endangered Species Act (ESA);
- Migratory Bird Treaty Act;
- Clean Water Act;
- Section 106 of the National Historic Preservation Act (NHPA); and
- other pertinent state, local, or county regulations.

Chapter 2 – Proposed Action and Alternatives

This chapter describes the activities of both the No Action alternative and the Proposed Action. These alternatives have been evaluated with respect to the affected environment, as described in Chapter 3, to provide a clear basis among the options available, from which Reclamation will make its decision. No new alternatives were identified during scoping.

2.1 No Action

Under the No Action alternative, Reclamation would not allow DVCD to use NFWF sub-grant funding to control weeds and restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation. DVCD could potentially obtain funding from other sources to treat weeds and establish native and desirable vegetation in the proposed project area, but treatments would be delayed.

2.2 Proposed Action

The proposed action is to allow DVCD to use NFWF sub-grant funding to remove and control weeds and to establish native and desirable vegetation on 12 parcels of land along the Middle Carson River. Proposed treatment parcels are active or retired agricultural lands that have become infested with weeds. Treatment priorities are non-native, noxious, and invasive weeds listed on the Nevada Noxious Weed List (NDA 2015a). Primary species of concern are Russian knapweed, diffuse knapweed (*Centaurea diffusa*), spotted knapweed (*Centaurea stoebe*), hoary cress (*Cardaria draba*), perennial pepperweed, Scotch thistle (*Onopordum acanthium*), musk thistle (*Carduus nutans*), Russian thistle (*Salsola tragus* or *S. iberica*), Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), tamarisk, and yellow starthistle (*Centaurea solstitialis*).

2.2.1 Treatment Types

Depending on the specific conditions within a parcel, treatment would generally consist of mowing decadent weed materials, herbicide spraying, and seeding (Table 1). Mowing would occur using a tractor with a hitch-mounted rotary cutter. Herbicide spot treatments would be done using a backpack sprayer; a 16-ft wide boom spray trailer towed by a pickup truck would be used for larger infestations. Seed bed preparation would involve dragging a meadow harrow behind a tractor. Seeding of native and desirable vegetation would be accomplished either using an all-terrain vehicle (ATV) towing a broadcast seeding unit or drill seeding to approximately 0.5 inch (in.) depth. Drill seeding would be the primary method used. Broadcast seeding, potentially in combination with use of a drag harrow (with metal tines up) to cover the seed with soil, would be employed in areas of parcels where the seed drill is too large and/or access is otherwise impaired (*e.g.*, ditches without culverts, washed out roads, dense stands of large cottonwoods). All treatment parcels would be mapped and monitored for weed species composition and distribution. Global Positioning System (GPS) waypoints would be used to establish photopoints and for long-term monitoring of treatment areas.

Table 1 – Location, Ownership, and Acres of Proposed Treatment Types by Parcel.

Parcel	Location ^a	Ownership	Total Acres	Mow	Backpack Spray	Boom Spray	Drill/ Broadcast Seed	Map	Inventory
1a	39.1314 -119.3552	Lyon County	19	19	19	0	19	19	19
1	39.2582 -119.5817	Private	32	32	32	0	32	32	32
2	39.2605 -119.5725	Private	14	14	14	0	14	14	14
3	39.2625 -119.5726	Private	33	33	33	0	33	33	33
4	39.2654 -119.5665	Private	19	19	19	0	19	19	19
5	39.2651 -119.5692	Private	20	20	20	0	20	20	20
6	39.2654 -119.5604	Private	21	21	21	0	21	21	21
9	39.2715 -119.5552	Private	35	35	35	0	35	35	35
10	39.2715 -119.5552	Private	139	139	139	0	139	139	139
10a	39.1706 -119.3048	Lyon County	73	73	73	0	73	73	73
19	39.2901, -119.4465	Private	25	25	0	25	0	25	25
20	39.2901, -119.4465	Private	21	21	0	21	0	21	21
Total Acres			451	451	405	46	405	451	451

^a Latitude, Longitude.

2.2.2 Equipment

Summary of primary equipment to be used:

- Pickup truck
- Trimble® Juno® GPS
- Digital camera
- John Deere® 5075E 4x4 Tractor and John Deere® 4052R Compact Utility Tractor
- Great Plains® 3P606NT 6 ft Mounted No-Till Compact Drill
- John Deere® H180 Loader with High-volume Bucket
- Bush Hog® 7 ft Rotary Cutter
- 2008 Polaris® RANGER® Utility Side x Side (UTV) and 2008 Polaris® Sportsman® ATV
- ATV Hitch Mounted Material Spreader
- 6 ft drag harrow with metal tines
- Chapin®/Wil-gro ProSeries Backpack Sprayer 61908 (4 gallon) and Solo® 575-B Backpack Sprayer (4 gallon)

2.2.3 Herbicides

Herbicide use would vary by parcel based on soil type(s), proximity to water, and target weeds. Table 2 lists the herbicides, with their active ingredients, which are proposed for use. Other chemicals proposed for use are non-ionic surfactants (Activator 90™ and Liberate®) to enhance the activity and effectiveness of the herbicides.

Table 2 – Proposed Project Herbicide Characteristics.

Active Ingredient	Trade Name	Mode of Action	Target Weeds	Timing	Formulation
Chlorsulfuron	Telar® XP	Amino acid synthesis inhibitor	Primarily broadleaf species	Pre- or postemergence	Liquid
Aminopyralid	Milestone®	Growth regulator	Broadleaf species	Postemergence	Liquid
Aminopyralid + metsulfuron	Opensight®	Growth regulator + amino acid synthesis inhibitor	Broadleaf and woody species	Postemergence	Granular
2,4-Dichlorophenoxyacetic acid (2,4-D)	Many	Growth regulator	Broadleaf and woody species	Postemergence	Liquid

2.2.4 Best Management Practices

In addition to following herbicide label instructions, the following Best Management Practices (BMPs) would be implemented by DVCD in association with the proposed treatments.

- Wash equipment before and after it is transported to treatment parcels to avoid spreading weeds to non-infested areas.
- Do not transport heavy equipment into infested sites unless it will be used on site.
- Closely monitor forecasted weather conditions to determine if treatment should proceed.
- Equip all vehicles with a Kestrel® 3000 Pocket Weather Meter or similar device to measure wind speed, humidity, temperature, heat index and dew point, so that herbicide label instructions can be followed at a site-specific location and to avoid herbicide drift.
- Do not proceed with herbicide application if winds consistently exceed 10 miles per hour.
- Choose herbicides based on land use, soils, species present, drainage, and potential for herbicide residual to affect planting timing and seed germination.
- Use application buffer zones, straw wattles, silt fencing, and supplemental water as needed.
- Equip all vehicles with clean water and spill containment kits.
- Use backpack sprayers as the primary method for herbicide application to ensure precise spot treatment.
- Use backpack sprayers equipped with a pressure control valve on the wand, so the pressure is consistent for accurate application rates.
- Calibrate application equipment prior to use to ensure that mixing ratios are accurate.
- Train the application crews to identify local plants and have crews carry field identification guides covering the targeted weeds as well as native and desirable plants to be protected.
- Use NDA-certified pesticide applicators to oversee herbicide treatments.
- Maintain spray records of all herbicide applications.
- Keep Material Safety Data Sheets (MSDS), Safety Data Sheets (SDS), and product labels on site for all chemicals to be used.
- Obtain NRCS soil survey data for each treatment parcel, and coordinate with NRCS to determine an appropriate seed mix containing native and desirable species.

- Leave existing native and desirable vegetation untreated except where agricultural producers are maintaining dryland pastures.

DVCD would acquire right-of-entry authorizations from willing private landowners for treatment access. For parcels that contain public use areas (*e.g.*, Lyon County Open Space, Parcels 1a and 10a) cautionary notice signs regarding herbicide use would be posted at access points prior to initiating treatment. These signs would identify the herbicide(s) to be used, date of application, date of expiration of the cautionary notice (at least 48 hours after application), name and phone number of a DVCD contact, and the phone number for the Nevada Department of Health and Human Services. The signs would be removed by DVCD as soon as possible after expiration of the cautionary notice.

An early detection-rapid response approach would be used for the treatment parcels during the proposed action. This approach involves monitoring areas where herbicide applications have occurred, identifying new weed infestations or weed regrowth, developing a re-treatment strategy, and implementing the strategy as soon as possible. This approach also captures late season germination of some invasive weeds (*e.g.*, perennial pepperweed). Successful weed treatments can require multiple applications of the same herbicides or different herbicides in a single area over time. In successive applications, the quantity of herbicide used generally decreases along with the size of the treatment area. For most effective treatment, spraying typically would be done when weeds are in the shoot life stage (*e.g.*, new growth after being mowed).

The seed mixes applied in treatment parcels would be based on soil type. A drought tolerant mix would be used in most seedings because of a lack of ability to irrigate the parcels. Primarily native grass seed would be used, but the mix may also include native shrub species such as big sagebrush (*Artemisia tridentata*), fourwing saltbush (*Atriplex canescens*), and rabbitbrush (*Ericameria* spp.) depending upon seed costs and availability. The seed mix application rates would vary from 18 to 25 pounds of seed per acre.

Treatments would occur over a 12-month period. Ideally, mowing would be done in fall and winter, herbicide treatment in late spring and summer, and seeding in fall/early winter. Completion of the proposed project is expected by December 31, 2016. Partners in the project include willing private landowners, the Carson Water Subconservancy District, NDA, Nevada Division of Forestry, Nevada Division of Water Resources, Nevada State Conservation District Program, Nevada Division of Environmental Protection (NDEP), NRCS, and Lyon County.

The proposed project is a continuation of a series of priority projects in the Middle Carson River watershed designed to restore floodplain health and function (Wilkinson 2014, CWSD 2015a). Previous projects have been successful in reducing soil erosion, stabilizing river banks, trapping sediment, improving water quality, improving wildlife habitat, and reducing the negative impacts of invasive/noxious weeds. The proposed project would focus on floodplain weed management by treating new infestations and providing follow up treatments to previously treated areas. Successfully controlling the target weed species and replacing them with native and desirable species would be a major step forward in restoring the riverine ecosystem.

Chapter 3 – Affected Environment and Environmental Consequences

3.1 Introduction and Environmental Setting

This chapter describes the existing conditions of the project area, and provides an analysis of the potential impacts of implementing the proposed action. The analysis is presented by each resource that may be directly or indirectly affected by the proposed action, consistent with NEPA guidelines.

At approximately 3,965 square miles, the Carson River watershed encompasses parts of 2 states and 6 counties (JBR Environmental Consultants 2012). The river flows generally eastward from its headwaters in the Sierra Nevada of California and terminates in the Carson Sink of Nevada. Both the East and West Forks of the Carson River originate as snowmelt and springs in Alpine County, California, at about 9,000 and 11,000 ft in elevation, respectively. The confluence of the East and West Forks is near the town of Genoa in Douglas County, Nevada. From the confluence, the Carson River flows along the east side of Carson City and then turns east and enters Dayton Valley (Lyon County). From Dayton Valley the river flows east to Lahontan Reservoir, its only major impoundment. Exiting Lahontan Reservoir, the Carson River flows east past Fallon, Nevada, and then northeast to the floor of the Great Basin at the Carson Sink in Churchill County. The upper watershed is generally defined as extending from the headwaters downstream to Mexican Dam, a diversion dam located southeast of Carson City; the middle watershed (Middle Carson River) from Mexican Dam to Lahontan Dam; and the lower watershed from Lahontan Dam to the Carson Sink (CWSD 2008).

The climate of the upper watershed is characterized by long, cold winters and short, moderately warm summers. The upper watershed receives about 40 in. of precipitation per year, mostly as snowfall. The climate of the middle and lower watersheds is semi-arid to arid; average annual precipitation ranges from 8 to 20 in. at elevations of 4,500–9,000 ft and 4–8 in. at elevations less than 4,500 ft (CWSD 2008). The vegetation of the Carson River watershed includes alpine coniferous forests in the uppermost elevations; dry mixed conifer forests on the east slope of the Sierra Nevada; woodlands and shrublands on benches in the middle reaches; desert shrublands, grasses and barrens in the lower reaches; and alkaline wetlands in the Carson Sink (OBEC 2008).

Most of the Carson River is highly altered and ecologically degraded as a result of 150 years of impacts from human activity. The river has been dewatered, straightened and widened, and confined by levees; water quality has deteriorated from heavy metals and acid mine discharge (OBEC 2008). During the Comstock mining era, rafts of logs transported downstream during seasonal wood drives scoured the river banks. The river and its floodplain were also impacted by gravel mining, road and bridge construction, and irrigation diversions (CWSD 2007). Riparian forests were later converted to agricultural use and, more recently, developed for residential and commercial use. Fallowed farm fields and grazing pastures on the river's floodplain have been invaded by highly competitive, non-native, noxious and invasive weeds, which have impaired natural succession of native riparian vegetation communities. Major floods in 1997 and 2006 substantially expanded the distribution of perennial pepperweed in the Carson River floodplain (CWSD 2007).

3.2 Vegetation

3.2.1 Affected Environment

The proposed project is located on the Middle Carson River from approximately 1 mile upstream of Dayton to about 3 miles west of Fort Churchill State Historic Park. The natural topography in this reach was varied, with small and large channels, swales, and larger, deep, emergent open water wetlands (OBEC 2008). Historically, the river would have been more connected with its floodplain, supporting large areas of functioning riparian habitat. The historical vegetation was likely a continuous mosaic of structurally-complex, mixed-aged stands of native cottonwood, riparian shrublands, wet meadows, and emergent wetlands.

During settlement and development in the 1800s and 1900s, most of the riparian vegetation was removed and the floodplain terrace was converted to agricultural uses such as irrigated pasture and hay fields. Water was diverted from the river to support agriculture and towns. Large numbers of domestic livestock and wild horses grazed riparian areas and trampled river banks. Non-native, invasive plants were introduced and subsequently spread throughout the floodplain. The native riparian vegetation has been greatly reduced in areal extent, complexity, biodiversity, and health (OBEC 2008). However, some of Nevada's best remaining cottonwood gallery forests are along the Middle Carson River (JBR Environmental Consultants 2012).

OBEC (2008) provides riparian vegetation transect data from the Middle Carson River near the proposed treatment parcels. Fremont cottonwood (*Populus fremontii*), generally mature stands with little or no understory, comprise 13–20% of the woody vegetation cover. Big sagebrush comprise 10–15% cover, rubber rabbitbrush (*Ericameria nauseosus*) 2–10%, red willow (*Salix laevigata*) 1–11%, and tamarisk <1–6%. Total vegetation cover (woody and non-woody species) ranges from 37 to 55%, desirable native species from 16 to 31%, and weed species from 6 to 30%. Diversity of desirable species such as buffaloberry (*Shepherdia argentea*), Wood's rose (*Rosa woodsii*), and willows remains low, partly as a result of competition from weeds.

The majority of the proposed treatment parcels have all previously been cleared for agricultural uses, and native woody vegetation is generally only present around the edges or within adjoining riparian areas (Drews and Branch 2015). Parcel 1a does have an open stand of mature cottonwoods. Parcels 1, 2, and 10 are open, fallow fields. Russian thistle covers most of Parcels 3, 4, and 5. Parcels 6, 9, and 10a were recently cultivated and are relatively devoid of vegetation. A patch of dense rabbitbrush covers a portion of Parcel 10. Low grass cover characterizes Parcels 19 and 20, which are actively grazed and irrigated.

Restoration Activities

Collaborative restoration work in the past decade by government agencies, non-profit organizations, and private landowners has reduced the size of several large patches of noxious and invasive weeds in the floodplain. Lyon County Open Space properties that were previously private ranches have had multiple projects to control weeds, restore native and desirable vegetation, and stabilize river banks. Large-scale projects involving DVCD were completed in recent years on the Santa Maria Ranch Park, Upper Rolling A Ranch/Big Ranch Open Space, and Rolling A Ranch Park (Wilkinson 2014; CWSD 2015a). Despite these efforts many areas along the Middle Carson River still contain noxious and invasive weeds (Figure 6).

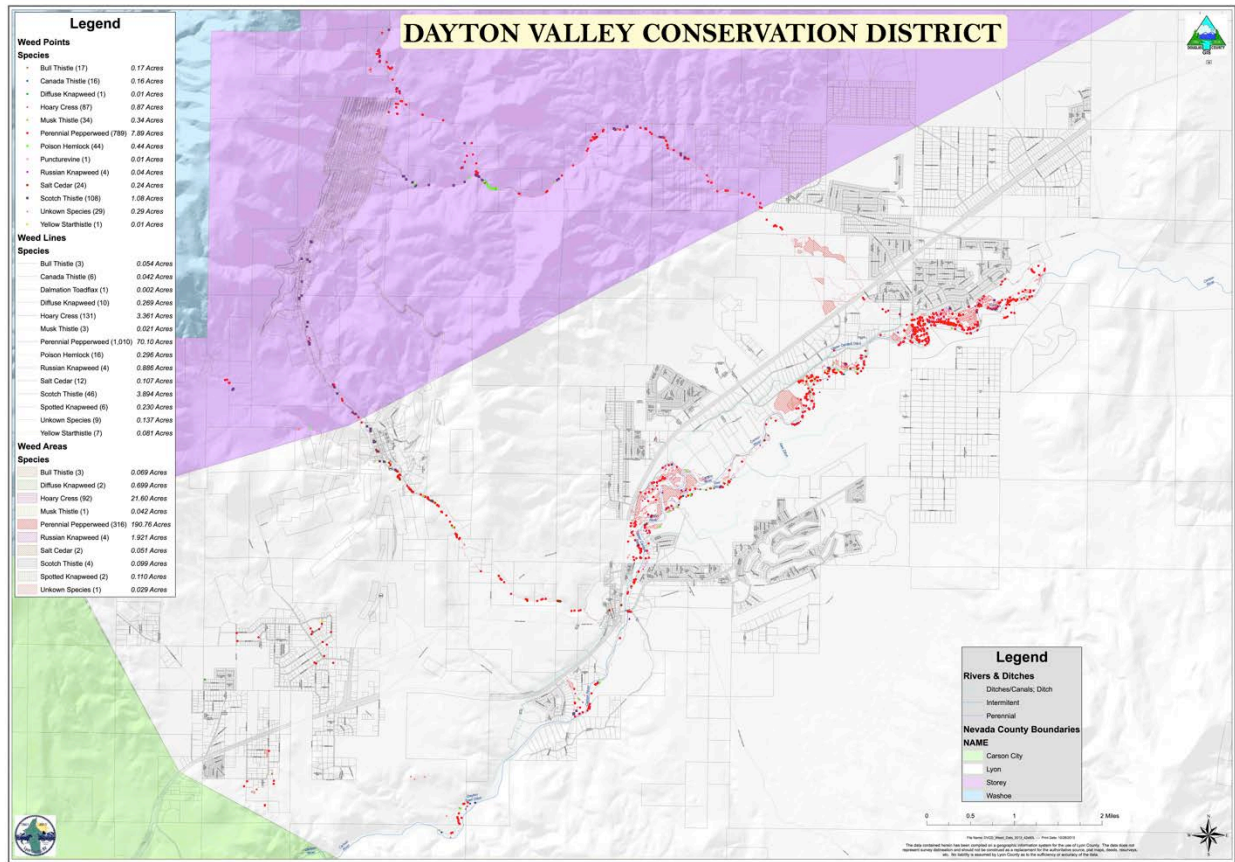


Figure 6. Dayton Valley Conservation District Weed Map.

Noxious Weeds

The State of Nevada maintains a noxious weed list (NDA 2015a). Weeds on the list are placed into three categories (NDA 2015b):

Category A: Weeds that are generally not found or that are limited in distribution throughout the State. Such weeds are subject to:

- (a) Active exclusion from the State and active eradication wherever found; and
- (b) Active eradication from the premises of a dealer of nursery stock.

Category B: Weeds that are generally established in scattered populations in some counties of the State. Such weeds are subject to:

- (a) Active exclusion where possible; and
- (b) Active eradication from the premises of a dealer of nursery stock.

Category C: Weeds that are generally established and generally widespread in many counties of the State. Such weeds are subject to:

- (a) Active eradication from the premises of a dealer of nursery stock.

Target Weed Species

A wide variety of invasive and noxious weeds are present within the Middle Carson River floodplain. The weeds discussed below are the primary target species for the proposed project.

Perennial Pepperweed

Perennial pepperweed is a widespread, non-native, noxious weed that forms large, dense monoculture stands in wet areas or areas with high water tables such as floodplains, irrigation structures, wetlands, and riparian areas. Mature plants are 2–4 ft in height and form dense mats of aboveground dead material that prevents other desirable plants from becoming established. Perennial pepperweed is a member of the mustard (*Brassicaceae*) family, is a prolific seed producer, and has an extensive root system. The plant is easily established from root fragments and seeds. It can be difficult to control, but mowing followed by herbicide treatment can be effective. Revegetating with fast-growing, competitive, desirable plant species after herbicide treatments is critical for long-term control (Wilson 2015). Perennial pepperweed is a Nevada Category C noxious weed (NDA 2015a).

Diffuse Knapweed

Diffuse knapweed, a Nevada Category B noxious weed (NDA 2015a), is a biennial or short-lived perennial native to Eurasia (Graham and Johnson 2004a). A member of the sunflower (*Asteraceae*) family, diffuse knapweed spreads solely by seed with vectors including vehicles, wind, water (streams and irrigation systems), wildlife, and contaminated hay. Diffuse knapweed is found in open, disturbed sites, where it is a vigorous competitor for soil moisture in the spring because of its early growth and deep taproot. A combination of treatment methods, including chemical control, can be effective in controlling infestations (Graham and Johnson 2004a).

Spotted Knapweed

Spotted knapweed, a Nevada Category A noxious weed (NDA 2015a), is similar in characteristics to diffuse knapweed but more tolerant of moist sites. It is also a member of the sunflower (*Asteraceae*) family. It invades disturbed areas, but also well-managed rangelands (Graham and Johnson 2004b). Spotted knapweed has allelopathic properties (excretes seed germination/growth inhibiting chemicals) and is a vigorous competitor that can form dense stands. Several biological control agents have been released with various levels of success. Integrated treatment measures, including herbicides with residual activity, provide the best control.

Russian Knapweed

Russian knapweed is a long-lived, non-native invasive weed that is difficult to control once established. It is a member of the sunflower (*Asteraceae*) family and native to Eurasia. Russian knapweed is a perennial plant that is highly adaptable to disturbed areas in both moist and arid microsites. It produces chemicals that are toxic to other plants and forms dense monocultures. Russian knapweed is a strong competitor for soil moisture because of its deep, extensive perennial roots and early spring growth. It is spread both by vegetative reproduction and seed. Infestations generally require multiple chemical, mechanical, and cultural¹ treatments. Revegetating with competitive native or desirable species is critical to long-term control (Graham and Johnson 2004c). Russian knapweed is a Nevada Category B noxious weed (NDA 2015a).

¹ Cultural controls includes methods that impact weed growth, such as crop rotation, irrigation, crop row spacing, and cultivation of more desirable competing vegetation to prevent the establishment of weed species in an area.

Hoary Cress

Hoary cress is a member of the mustard (*Brassicaceae*) family that is found in a variety of sites, but most often on disturbed alkaline soils. Plants produce a large amount of seed that easily spreads and quickly germinates. Seeds can remain viable for up to 3 years. Hoary cress also sprouts from rhizomes that can grow up to 12 ft long in the first season. It forms dense stands that exclude other plants. Control of hoary cress requires repeated chemical treatments, revegetating with perennial desirable plants, and monitoring (Kadrmaz and Johnson 2002a). Hoary cress is listed as a Nevada Category C noxious weed (NDA 2015a).

Scotch Thistle and Musk Thistle

Scotch thistle and musk thistle are biennial members of the sunflower (*Asteraceae*) family, and are native to Europe and Asia. Both thistles are prolific seed producers. Scotch thistle is capable of year-round germination and thrives in open, disturbed moist areas, but can also grow in drier disturbed sites. Musk thistle is similar in its ability to adapt to a wide variety of sites and thrives in disturbed areas with low amounts of competing vegetation. Scotch thistle can grow 8–12 ft tall and up to 5 ft wide. Both thistles have large spiny leaves and can form dense stands that are impenetrable by people and wildlife. Infestations must be treated early (at the rosette stage) prior to seed production. A combination of mechanical, physical, and chemical control methods is most effective to eliminate thistle seedlings (Kadrmaz and Johnson 2002b, 2002c). Both Scotch and musk thistle are listed as Nevada Category B noxious weeds (NDA 2015a).

Canada Thistle

Canada thistle is the most widespread thistle species in the United States and is considered a noxious weed throughout the West (Graham and Johnson 2003). A perennial plant in the sunflower (*Asteraceae*) family, Canada thistle's extensive root system is capable of growing more than 19 ft horizontally in one season and to depths of 22 ft over time. The roots survive severe winters and produce new shoots year-round which makes control difficult. Canada thistle is found in open, disturbed areas with some moisture. It can form large infestations that displace native plants and desirable forage, degrade wildlife habitat, and restrict access by recreationists. Successful control involves repeated mechanical, chemical, or combination treatments. Canada thistle is listed as a Nevada Category C noxious weed (NDA 2015a).

Bull Thistle

Bull thistle is a biennial weed found in all Nevada counties (Graham *et al.* 2005). It is in the sunflower (*Asteraceae*) family. Bull thistle does not have an extensive rhizomatous root system and reproduces only by seed. It is found in open, disturbed areas on nitrogen-rich, relatively-moist soils. Bull thistle can be controlled in the rosette stage by a variety of herbicides. In the bolting to bud stage, metsulfuron or chlorsulfuron are effective. Bull thistle is not listed as a noxious weed in Nevada (NDA 2015a).

Yellow Starthistle

Yellow starthistle is a rapid colonizer of open, disturbed areas that is native to Eurasia (DiTomaso *et al.* 2007). It is in the sunflower (*Asteraceae*) family. A winter annual that forms dense infestations, yellow starthistle excludes native and desirable vegetation and depletes soil moisture by growing early, deep roots. Yellow starthistle reproduces by seeds, which persist in the soil for up to 10 years. Control methods such as cultivation, grazing, mowing, and burning

can be effective, as are a variety of pre- and post-emergent herbicides. Site occupancy by desirable vegetation is important to avoid re-infestation of yellow starthistle. Prevention, rapid detection, mapping, and eradication of new infestations are critical in areas with relatively small, isolated populations (Zimmerman *et al.* 2001). Yellow starthistle is listed as a Nevada Category A noxious weed (NDA 2015a).

Russian Thistle

Russian thistle, often known as tumbleweed, is a member of the goosefoot (*Chenopodiaceae*) family. Native to Russia and Siberia, it grows as a summer annual on dry, disturbed sites such as roadsides and fallow agricultural fields. Russian thistle grows rapidly in late winter and early spring, developing a deep taproot and growing up to 6 ft in diameter by fall and early winter. When mature, it breaks off at the base and is blown by the wind, dispersing seed as it moves. Seeds do not persist in the soil more than 1 year. Russian thistle is particularly adapted to desert environments because of its tolerance of drought and alkaline soils. Control by preventing germination and seed production may be achieved using pre-emergent herbicides followed by post-emergent herbicides applied when the plant is at an early growth stage (Orloff *et al.* 2008). Russian thistle is not listed as a noxious weed in Nevada (NDA 2015a).

Tamarisk

Tamarisk is in the tamarisk (*Tamaricaceae*) family, native to Eurasia and Africa. It grows as a shrub or small tree that invades riparian areas in the southwestern United States. Tamarisk reproduce vegetatively and also produce large numbers of tiny seeds that are quick to germinate in wet soil. They use a relatively large amount of groundwater and are known to contribute to drying up seasonal wet areas, springs, and streams. Tamarisk leaves excrete salts that accumulate in a mulch layer resulting in the exclusion of salt-intolerant plants from the understory. Although tamarisk can provide cover and habitat structure for wildlife, infested areas tend to have low biological diversity. Mechanical treatment combined with herbicides provides control, but complete death of the root system is necessary to prevent sprouting (Johnson *et al.* 2002). Biological controls, such as the tamarisk leaf beetle (*Diorhabda carinulata*), can suppress tamarisk populations by 75–85 percent (DiTomaso *et al.* 2013). Tamarisk is listed as a Nevada Category C noxious weed (NDA 2015a).

3.2.2 Environmental Consequences

No Action

If Reclamation does not allow DVCD to use NFWF sub-grant funding to treat noxious and invasive weeds and restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation, DVCD would have to delay the project while finding alternative funding or eliminate the project altogether. Populations of noxious and invasive weeds would continue to dominate parcels within the proposed project area. Smaller weed infestations would most likely increase in size, and all infestations would likely become more difficult and expensive to control in the future. The No Action alternative could thereby slow or reverse the current trend of increasing native vegetation and improving riparian habitat on the Middle Carson River.

Proposed Action

If the proposed action is implemented, infestations of multiple noxious and invasive weeds within the treatment parcels would be reduced or eliminated. The spread of these species from

the project area to other lands would also be reduced. Residual native plants adjacent to spot treatments would produce seed to naturally begin revegetating the treated areas within 1–2 years. The drill-seeded parcels would be revegetated primarily by species in the seed mix within 1 year after planting given suitable weather conditions. Through seeding, native and desirable vegetation would increase in percent cover and may gain a competitive advantage in areas previously dominated by noxious weeds. Conditions would gradually become more favorable for longer-term natural succession to native shrubs and trees in the riparian zone.

3.3 Wildlife

3.3.1 Affected Environment

This section discusses wildlife species and their habitats in and near the proposed treatment parcels. Potential direct impacts to wildlife from herbicide applications are discussed in section **3.8 Health and Safety** below in association with potential human health impacts.

Many important wildlife species in the arid Great Basin require riparian and wetland habitat. Riparian zones are critical areas of wildlife diversity in Nevada with more than 75% of wildlife species and 80% of bird species associated with riparian vegetation. Riparian areas are the most productive habitats in Nevada and provide critical wildlife corridors for short-distance movements and long-distance migrations (NDOW 2012). Nevada riparian areas are especially important for migrating birds. These species, their occupied nests, and their eggs are all protected under the Migratory Bird Treaty Act (16 USC 703 *et seq.*, 50 CFR §21, 50 CFR §10).

Human alterations to the Middle Carson River since the mid-1800s have resulted in major habitat deterioration and reductions in populations of native wildlife dependent upon riverine habitats. Of particular concern is the loss of large, contiguous stands of cottonwoods with a mix of age, size classes, and understory composition; dense riparian shrub thickets; and floodplain wetlands such as oxbows, sloughs, and marshes (OBEC 2008).

Birds

The Carson River is one of the most important river corridors in Nevada for bird species diversity (OBEC 2008). OBEC (2008) surveyed several transects on the Middle Carson River for birds. The Dayton Transect is relevant to the proposed project area based on both proximity and setting. A portion of the transect receives some protection as it includes Dayton State Park, but it is adjacent to housing tracts and other development. Much of the land adjacent to the park is comprised of fallowed agricultural fields in various stages of succession and restoration. This area no longer has prescribed grazing by domestic livestock, although a portion is utilized by herds of wild horses. The Dayton Transect had 55 bird species recorded during 4 visits in 2002 and 2003. The most common species were European starling (*Sturnus vulgaris*), black-billed (American) magpie (*Pica hudsonia*), and California quail (*Callipepla californica*). Western bluebirds (*Sialia mexicana*), several species of raptors, herons, egrets, swallows, and yellow warblers (*Setophaga petechial*) were also recorded. Downy woodpeckers (*Picoides pubescens*) and northern flickers (*Colaptes auratus*) were present in the Dayton Transect; they both excavate their own nest cavity (primary cavity nesters) in large diameter cottonwoods. These species are important because multiple secondary cavity nester species use their former nest sites.

Most of Fort Churchill State Historic Park and the river floodplain downstream to Lahontan Reservoir are within the Carson River Delta Important Bird Area (IBA) designated by the Lahontan Audubon Society (McIvor 2005). IBA designation was based on observations of five Nevada Partners in Flight species of concern including: Bald eagle (*Haliaeetus leucocephalus*), Cooper's hawk (*Accipiter cooperii*), yellow-billed cuckoo (YBC; *Coccyzus americanus*), willow flycatcher (*Empidonax traillii*), and western bluebird. This IBA represents the "last best example of a riparian cottonwood forest in western Nevada" (Lahontan Audubon Society 2006).

Yellow-Billed Cuckoo

Gallery cottonwood forests above Lahontan Reservoir are the only known breeding site for YBC in northern Nevada (Chisholm and Neel 2002). YBC is listed as threatened under the Endangered Species Act (U.S. Fish and Wildlife Service (USFWS) 2014a), protected as a Sensitive Bird in Nevada (Nevada Administrative Code 503.050.3), and designated as a Nevada Wildlife Action Plan Species of Conservation Priority (NDOW 2012). Specific threats to YBC include habitat loss from altered hydrology, overgrazing in riparian zones, and the conversion of native habitat to predominantly non-native vegetation. The loss of large, contiguous habitat areas has led to increased predation and reduced dispersal potential (USFWS 2014a). Critical habitat for YBC has been proposed, including 12 miles (4,348 acres) of the Carson River (Critical Habitat Unit 75/NV-4 Carson River) (USFWS 2014b). The western edge of the proposed Carson River critical habitat unit lies approximately 0.7 mile downstream from DVCD's easternmost proposed treatment, Parcel 20.

YBC require the relatively moist and cool conditions of large (50–200+ acres), dense (>50% canopy closure) stands of riparian forest adjacent to water (Great Basin Bird Observatory 2012, USFWS 2014a). In proposing critical habitat, the USFWS identified blocks of mixed willow-cottonwood riparian woodland habitat greater than 200 acres in extent and 325 ft in width, with one or more densely foliated (70% canopy cover), willow-dominated nesting sites as essential to provide for the species' life-history processes (USFWS 2014b). Continuous riparian vegetation, even if not suitable for nesting or foraging, can be used for movement and dispersal corridors (JBR Environmental Consultants 2012). In order for the Middle Carson River to remain viable habitat for YBC, the natural processes of native vegetation succession must be maintained (USFWS 2014b).

Mammals

Maintaining riparian areas with successional paths for recruitment and retention of large cottonwood trees is an important consideration in riparian forest restoration not only because of the habitat requirements of birds, but also for a variety of other wildlife species. Cavities in cottonwood snags (dead trees) can serve as dens or resting sites for mammals such as bats (Families *Molossidae*, *Phyllostomidae*, and *Vespertilionidae*), skunks (*Spilogale gracilis* and *Mephitis mephitis*), raccoons (*Procyon lotor*), and weasels (*Mustela* spp.). Small rodents (Order *Rodentia*), rabbits (*Sylvilagus audubonii*), foxes (*Urocyon cinereoargenteus* and *Vulpes vulpes*), raccoons, weasels, skunks, and North American river otters (*Lontra canadensis*) use downed logs as hiding, feeding, and/or nesting areas. The riparian zone provides an important corridor for wildlife migrating from one habitat or geographic area to another and for seasonal movements between high- and low-elevation areas. Connectivity between river reaches with

functional riparian habitat is an important component of restoring new areas, as they will be more quickly colonized by native wildlife species from adjacent habitat.

Amphibians

Riparian areas provide open water, moist soils, and cool microclimates that are important for amphibians (Brode and Bury 1984, as cited in Reclamation *et al.* 2008). Riparian areas provide amphibians with breeding sites, escape habitat, and foraging sites. In wet years, high river flows may inundate areas further away from the main channel and provide additional temporary breeding ponds for amphibians. Emergent wetlands and pond-like areas are indicative of potential amphibian breeding habitat along the Middle Carson River.

3.3.2 Environmental Consequences

No Action

If Reclamation does not allow DVCD to use NFWF sub-grant funding to treat noxious and invasive weeds and restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation, DVCD would have to delay the project while finding alternative funding or eliminate the project altogether. Populations of weeds would continue to dominate parcels within the proposed project area. Wildlife habitat would not improve and could become more degraded as weed infestations increase in size and density. Progression toward a continuous corridor of high quality riparian wildlife habitat within the proposed project area would either not occur or be delayed. Repopulation of areas by wildlife would be unlikely while native vegetation continues to be displaced by weeds and suitable habitat is not restored. Under the No Action alternative there would be no disturbance to wildlife from mapping, mowing, herbicide application, seeding, or monitoring.

Proposed Action

Controlling invasive weeds that compete with native plants is a critical step in restoring a continuous corridor of healthy, functioning riparian wildlife habitat along the Middle Carson River. Despite the degradation of much of the floodplain, patches of riparian habitat remain along with populations of many riparian-dependent wildlife species. Implementation of the proposed project would help the successional process toward a mosaic of native grasses, forbs, shrubs, and trees along the floodplain corridor that would provide habitat for a variety of riparian-dependent wildlife species. Over time, native wildlife species would have the potential to recolonize the proposed treatment parcels from adjoining occupied habitats.

Direct impacts to wildlife from the proposed action are possible if individuals are present within a treatment parcel. The broad timeframe of the various treatments (mowing in fall and winter, herbicide spraying in late spring and summer, and seeding in fall/early winter) would increase the potential for direct impacts to wildlife. However, direct impacts would be unlikely because of the limited use of noxious and invasive weeds by wildlife. No federally-listed species would be affected because they are not known to occur in the project area. Local wildlife could be indirectly impacted by disturbance and noise from nearby equipment usage and human activity during spraying, mapping, and monitoring. All such disturbance would be temporary (lasting a few hours to a few days) and intermittent and is not likely to result in any long-term impacts to individuals or populations.

3.4 Geology and Soils

3.4.1 Affected Environment

The Carson River watershed is seismically active with a complex series of faults spanning a large area of western Nevada (CWSD 2008). The landform along the Middle Carson River from Dayton to Lahontan Reservoir is dominated by valley fill plains, including alluvial flats, lake plains, floodplains, and low stream terraces (OBEC 2008). Drainage is altered in most areas. Elevations range from 4,200 to 5,200 ft, and annual precipitation ranges from 4 to 6 in. Salt and alkali affect vegetation productivity for some of the soils. Most soils in the proposed project area are classified as prime farmland or farmland of statewide importance (NRCS 2015a).

A total of 19 soil map units² intersect the 451 acres of the proposed treatment parcels (NRCS 2015a). Approximately 41% of the combined parcel acreage is mapped as Dithod loam. This stream terrace soil is derived from alluvium of mixed basic rocks, with a typical soil profile of loam in the H1 layer³ (0–11 in.), silt loam in H2 (11–20 in.), stratified sandy loam to clay loam in H3 (20–60 in.), and loamy fine sand in H4 (60–64 in.). The drainage class of Dithod loam is characterized as somewhat poorly drained; the ecological site is moist floodplain. Rose Creek loam covers 25% of the total proposed treatment area. The parent material is alluvium from mixed basic rocks. The typical soil profile consists of loam in the H1 layer (0–18 in.) and stratified gravelly sand to silt loam in the H2 layer (18–60 in.). Rose Creek soils are frequently flooded with only an 18–36 in. depth to the water table. The landform associated with Rose Creek soils is floodplain, and the ecological site is classified as a wet meadow (NRCS 2015a).

3.4.2 Environmental Consequences

No Action

If Reclamation does not allow DVCD to use NFWF sub-grant funding to treat noxious and invasive weeds and restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation, there would be no impact to geology or soils as a result of the proposed project. However, over time the spread of weeds such as perennial pepperweed can increase soil erosion on river banks during flood events because their roots do not bind the soil as well as native vegetation (DiTomaso *et al.* 2013).

Proposed Action

If Reclamation allows DVCD to use NFWF sub-grant funding to treat noxious and invasive weeds and restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation, surface soils could be temporarily disturbed by mowing (451 acres), drill/broadcast seeding (405 acres), and boom spraying (46 acres) equipment. Many parcels would experience additive soil disturbance from sequential treatments. However, use of tow vehicles (trucks, tractors, ATV, UTV) and equipment with rubber tires (*vs.* tracks) would minimize the impacts. The greatest soil disturbance would occur from drill seeding and from dragging a harrow after broadcast seeding.

² A map unit is a collection of areas defined and named the same in terms of their soil components or miscellaneous areas or both (NRCS 2015b).

³ H represents a soil master horizon/layer. H layers are dominated by organic material and are/were saturated with water for prolonged periods (Food and Agriculture Organization of the United Nations 2006).

All proposed treatment parcels are retired agricultural areas with nearly level topography, so the potential for damaging gullying or scouring from heavy rain events after treatments is relatively low. Flooding along the Middle Carson River could impact floodplain areas with a low amount of plant cover, and recently disturbed areas such as the treatment parcels would be expected to have a higher risk of erosion until native and desirable plant cover is established in 1–2 years.

Herbicide prescriptions would be developed for each parcel based on site-specific soil information (NRCS 2015a), field observations, proximity to water, and target weed species. Label instructions and BMPs would be strictly followed. Because of these measures, no adverse effects to soils from herbicide applications are likely to occur.

3.5 Water Resources

3.5.1 Affected Environment

The natural hydrologic cycle of the Carson River typically follows a pattern of snowmelt runoff that peaks in May, followed by a period of declining flows, then sustained low (base) flows from August to March, with periodic high intensity-short duration peak flows during the winter (OBEC 2008). Rain-on-snow events in the upper watershed may cause large volume, high intensity flows that can lead to flooding in the lower watershed (CWSD 2008).

The Middle Carson River is designated as U.S. Geological Survey Hydrologic Unit Code #16050202 (Seaber *et al.* 1987). Similar to most river systems in the western United States, the Middle Carson River's flows and flow pattern have been greatly altered by human activity in the past 150 years. The Carson River has one major water storage facility, Lahontan Reservoir, which is downstream from the proposed treatment parcels. Most storage facilities on the Carson River are small natural lakes in the upper watershed, which have minimal impacts on total storage and the natural flow regime (CDWR 1991, OBEC 2008). Cumulative water diversions, primarily for agriculture, have a major effect on flows. Dozens of upstream diversions greatly reduce summer flows and can eliminate flows entirely in some reaches of the Middle Carson River by late summer (JBR Environmental Consultants 2012).

The administration of Carson River water rights in Nevada is conducted by the Office of the Nevada State Engineer under the system of Prior Appropriation, also known as appropriative rights or “first-in-time-is-first-in-right.” The majority of water rights relevant to land along the Middle Carson River are agricultural irrigation rights. The Alpine Decree, which was finalized in 1980, regulates the appropriation of surface water rights of the Carson River (United States *vs.* Alpine Land & Reservoir Company *et al.*; Civil No. D-183 BRT). In the Alpine Decree, the Carson River was divided into segments, and each segment is administered autonomously. Segment 7, which is the mainstem Carson River from Carson City to Lahontan Reservoir, is further divided into 5 autonomous subsegments that correspond to named irrigation ditches (Hess and Taylor 1999, Horton 2013). The proposed project is located in subsegments 1 and 3. Subsegment 1 includes the Cardelli Ditch and the Dayton Town (Rose) Ditch. The Upper Cardelli Ditch serves the properties with most of the proposed treatment parcels; the Dayton Town (Rose) Ditch serves Parcel 1a. Subsegment 3 includes the Koch (Chaves) Ditch, which serves Parcels 19 and 20. Parcels 19 and 20 are currently irrigated pastureland; the other 10 parcels have no active irrigation.

River channelization for flood control purposes has caused negative ecological and hydrological effects in some reaches of the Carson River:

- Peak flows are disconnected from the floodplain.
- The surface elevation of the river is lowered, which dries the upper banks and lowers the water table, leading to a change in the floodplain plant community to a drier type such as sagebrush.
- The complexity and diversity of aquatic habitat types are reduced as naturally-formed hydraulic structures (pools, riffles, gravel bars, etc.) are eliminated.
- Flow velocity is increased, which limits suitable conditions for many aquatic species.
- Stream power is increased in the steeper, oversized channel, which increases erosion, scour, and incision (Brookes 1988, as cited in OBEC 2008).

The Carson River has experienced 33 flood events since 1852, 17 of which are considered major events (CWSD 2008). New Year's Day floods in 1997 and 2006 caused widespread damage. Damage from the 2006 event was disproportionate to flows, leading to concern that development in the floodplain has produced reaches in which the river no longer has access to its floodplain to slow and spread floodwaters (CWSD 2008). The Federal Emergency Management Agency (FEMA) describes three "natural and beneficial functions" of floodplains (FEMA 2002).

1. Natural (undeveloped) floodplains have a beneficial role in spreading floodwaters over a large area. Flood velocities are reduced and space is provided for floodwaters, which reduces peak flows downstream. On natural floodplains wind and wave impacts are reduced, and vegetation captures soils and debris during flooding. Protected floodplains reduce the energy of a flood and therefore reduce damage to adjacent properties and areas downstream.
2. Water quality is improved in areas where natural vegetative cover acts as a filter for runoff and overbank flows. Water temperature is moderated on natural floodplains, which reduces potential damage to plants and animals.
3. Undeveloped floodplains can act as recharge areas for groundwater, reduce the frequency of low flow events, and increase minimum flow rates. Natural floodplains provide habitat for diverse species of plants and wildlife, some of which are solely dependent on riparian habitat. Natural floodplains are particularly important as breeding and feeding areas for birds and other wildlife.

River channelization and development in the Middle Carson River floodplain has led to increased risk and uncertainty regarding future flooding events and potential impacts on downstream properties. The remaining agricultural lands and other open space lands are critical in maintaining areas for the river to access its floodplain (CWSD 2008).

While periodic flooding has a beneficial role in the health of riparian communities, flooding also spreads noxious and invasive weeds. Reducing the abundance and distribution of weeds, such as perennial pepperwood, within the floodplain is an important component of river restoration. By

controlling weeds, natural successional patterns in the floodplain can proceed without being slowed or prevented by competition from weeds.

3.5.2 Environmental Consequences

No Action

If Reclamation does not allow DVCD to use NFWF sub-grant funding to treat noxious and invasive weeds and restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation there would be no direct impact to water resources as a result of the proposed project. Stabilizing floodplain areas with native and desirable vegetation would not occur, however, and flood events would continue to damage river banks and spread noxious and invasive weeds to new sites. Longer-term succession to a cottonwood gallery forest would be delayed because of competition with aggressive weeds. There would be no potential impacts to water quality from herbicides or ground disturbance.

Proposed Action

If Reclamation allows DVCD to use NFWF sub-grant funding to treat noxious and invasive weeds and restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation there would not be a direct, short-term impact to water resources except in the unlikely event of a chemical spill within or near water resources. DVCD would follow a spill prevention plan and have a spill containment kit in each vehicle. The proposed treatment parcels would eventually have a higher percentage cover of native and desirable vegetation that would have a long-term beneficial effect on the river's water quality, erosion, bank stability, and peak flows. Herbicide prescriptions would be developed for each parcel based on a soil resource report, field observations, proximity to water, and existing target weed species. Label instructions and BMPs would be strictly followed. In addition, the proposed action avoids herbicide applications immediately adjacent to the river, wetlands, and irrigation ditches. Because of these measures no adverse effects to water resources are likely to occur.

3.6 Air Quality

3.6.1 Affected Environment

The nearest population center to the proposed project area is Dayton, Nevada. Table 3 shows the percentage of the year (2010–2014) in the “good” range for the Air Quality Index (AQI) and six pollutants: Ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter less than 10 microns (PM₁₀), and particulate matter less than 2.5 microns (PM_{2.5}) (Homefacts 2015).

Table 3 – Air Quality Data for Dayton, Nevada, 2010–2014: Annual “Good” Percentage Ratings (Homefacts 2015).

Year	AQI	Ozone	CO	NO ₂	SO ₂	PM ₁₀	PM _{2.5}
2014	96.9	89.0	100	98.5	100	98.9	94.7
2013	94.3	93.2	100	99.1	100	95.9	82.9
2012	93.0	76.1	100	98.3	100	99.2	77.0
2011	96.8	94.9	100	95.9	100	97.6	94.3
2010	96.8	88.8	100	97.8	100	100	96.3

NDEP collects data through an ambient air quality monitoring network. The closest monitoring station to the project area is west of Dayton in Carson City, Nevada. From 2000 to 2010, monitored pollutants at the Carson City station included PM₁₀, PM_{2.5}, CO, and ground-level ozone. None of these pollutants exceeded national ambient air quality standards during that 10-year period, but PM_{2.5} came closest to exceeding its standard (NDEP 2010). From 1999 to 2009 Dayton's AQI was also similar to annual means for Nevada and the rest of the United States (USA.com 2015). Lyon County, where Dayton is located, is not designated as an air quality nonattainment area by the U.S. Environmental Protection Agency (EPA) (EPA 2015).

3.6.2 Environmental Consequences

No Action

If Reclamation does not allow DVCD to use NFWF sub-grant funding to treat noxious and invasive weeds and restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation, there would be no impact to air quality as a result of the proposed project.

Proposed Action

If Reclamation allows DVCD to use NFWF sub-grant funding to restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation, there would be potential low-level air quality impacts as a result of the proposed project. There may be localized increases in fugitive dust (particulate matter) during mowing and drill seeding treatments at most parcels, with the exception of the irrigated parcels (19 and 20). However, these dust emissions would be short-term and temporary. Other intermittent increases in dust emissions may occur under the proposed action during windy periods until exposed soils are revegetated through the proposed seeding or natural vegetation succession. Other sources of localized, temporary air pollution as a result of the proposed action would be exhaust from vehicles towing the mowing and drill seeding equipment.

Most of the proposed treatment parcels are not adjacent to highly populated areas, so potential human exposure to changes in air quality is limited. Some potentially-affected, isolated residences are associated with the treatment parcels, and the owners would be requested to sign a right-of-entry agreement for DVCD to proceed with the treatments. For the two parcels (1a and 10a) where treatments could affect more populated areas (housing subdivisions), DVCD would publicize the project locally to create public awareness, so that people may take steps to reduce exposure (*e.g.*, keeping windows closed during mowing activities).

3.7 Noise

3.7.1 Affected Environment

Ambient noise in the affected portion of the Middle Carson River floodplain is generally confined to natural sounds; infrequent, slow-moving vehicles; and agricultural equipment. Most of the floodplain in the area is not developed other than isolated houses associated with some of the proposed treatment parcels. However, Parcels 1a and 10a are adjacent to the Santa Maria Ranch and River Park housing subdivisions, respectively. Ambient noise for these parcels is generally higher due to various types of increased human activity at nearby homes and from use of the public open space lands for recreation.

3.7.2 Environmental Consequences

No Action

If Reclamation does not allow DVCD to use NFWF sub-grant funding to restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation there would be no noise impacts.

Proposed Action

If Reclamation allows DVCD to use NFWF sub-grant funding to treat noxious and invasive weeds and restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation there would be some noise impacts. Noise sources for the proposed project would be from DVCD application crew communications and equipment used during mowing and drill seeding, similar to normal agricultural production activities on these active and inactive agricultural lands, but with a shorter duration. Some potentially-affected landowners would sign right-of-entry agreements with DVCD and would be aware of temporary noise impacts. Residents of the Santa Maria Ranch and River Park subdivisions who are close to Parcels 1a and 10a could also be temporarily impacted by minor, short-term noise during mowing and drill seeding activities. DVCD would publicize the project locally, so that people are aware of possible impacts and may take steps to reduce noise exposure (*e.g.*, keeping windows closed).

3.8 Health and Safety

3.8.1 Affected Environment

Humans and wildlife could potentially be exposed to herbicides during treatment activities. Wildlife could be exposed if they are directly in the path of the spray, downwind (spray drift), or using an area that had a granular herbicide application with residual activity (*e.g.*, Opensight[™]). Human exposure could involve DVCD workers applying the herbicides, as well as members of the public accidentally or intentionally entering posted parcels during or soon after treatment. The latter exposure example is possible on open space properties which support public recreation (*e.g.*, Frisbee golf, hiking, biking, birding, fishing, and river access) than on private lands.

Herbicides have the potential to adversely affect the environment, and the EPA requires that all herbicides be registered prior to their sale, distribution, or use in the United States. In order to register herbicides for outdoor use, the EPA requires manufacturers to conduct toxicity testing on representative species of birds, mammals, freshwater fish, aquatic invertebrates, and terrestrial and aquatic plants. An ecological risk assessment uses the data collected to evaluate the likelihood that adverse ecological effects may occur as a result of herbicide use.

The U.S. Forest Service (USFS) contracts with Syracuse Environmental Research Associates, Inc. (SERA), to conduct human health and ecological risk assessments for herbicides that may be proposed for use on National Forest System lands. The SERA risk assessments represent the best science available, using peer-reviewed scientific literature and current EPA documents, to estimate the risk of adverse effects to non-target organisms. These risk assessments consider worst-case scenarios including accidental exposures, applications at maximum label rates, exposures of workers and the public, exposure of terrestrial and aquatic organisms, and eating or drinking contaminated material (USFS 2010). SERA assessments, which greatly exceed EPA regulatory requirements, identify the hazard or toxicity, assess the exposure and dose-response,

and characterize the risk of each herbicide. These assessments include the herbicide active ingredients proposed for use by DVCD.

Telar XP™

The SERA risk assessment for chlorsulfuron (USFS 2004a), the active ingredient in Telar XP™, concluded that there is no basis for suggesting that adverse effects to the general public or terrestrial and aquatic wildlife are likely, even at the highest application rates. For workers, the level of concern is reached at 0.14 pound per acre and “modestly exceeded” at the highest application rate of 0.25 pound per acre. The method of exposure is dermal (skin), which can be minimized or eliminated by proper use of PPE by workers. Damage to non-target plants is possible with ground broadcast application, but minimized with directed foliar application (*i.e.*, backpack spraying). Detectable damage to aquatic plants (macrophytes) is possible if sufficient herbicide material is transported into the water. Algae do not appear to be sensitive to chlorsulfuron.

2,4-Dichlorophenoxyacetic Acid

The SERA risk assessment for 2,4-D, the common name for 2,4-dichlorophenoxyacetic acid, noted that this herbicide has been well studied (USFS 2006). Some plausible accidental exposure scenarios for 2,4-D substantially exceed the level of concern, although adverse effects to aquatic wildlife from the amine form of 2,4-D (proposed for application by DVCD) are not likely. Care in handling of 2,4-D, including use of clean PPE, is important for workers, particularly those who apply 2,4-D repeatedly over a long time period. 2,4-D is slightly to moderately toxic to mammals; practically non-toxic to moderately toxic to birds; and practically non-toxic to honey bees. Among mammals, domestic dogs are more sensitive than other species to the effects of 2,4-D due to their limited ability to excrete organic acids. The EPA classifies the toxicity of 2,4-D to freshwater fish as practically non-toxic for 2,4-D acid/salts. A similar pattern of low toxicity is observed for aquatic invertebrates and amphibians. Direct spray, ingesting contaminated vegetation or insects, or contact with contaminated vegetation can all expose terrestrial animals. Unintended effects to non-target plant species, both terrestrial and aquatic, are possible in the event of spray drift, runoff, or spills.

Milestone™

The SERA risk assessment for aminopyralid, the active ingredient in Milestone™, noted that this product is considered a “reduced risk” herbicide by the EPA (USFS 2007). The SERA report stated, “As with any effective herbicide applied to terrestrial weeds, adverse effects in non-target terrestrial plants are plausible. There is no indication, however, that adverse effects on workers, members of the general public or other non-target animal species are likely.” This conclusion was based on somewhat limited studies at the time, but the preponderance of data indicated little or no systemic effects to animals. Aminopyralid is rapidly absorbed and excreted by mammals and not substantially metabolized. No mortality was caused at the EPA dose limits for oral toxicity studies, and no effects were noted from subchronic and chronic toxicity studies.

Opensight™

The active ingredients in Opensight™ are aminopyralid and metsulfuron. The SERA risk assessment for aminopyralid is discussed above. The following discussion is based on the SERA risk assessment for metsulfuron methyl, brand name Escort™ (USFS 2004b). Metsulfuron

methyl is a dry, flowable herbicide used for control of noxious weeds. It is considered low in toxicity to mammals. There is no evidence metsulfuron methyl poses any reproductive risks or causes malformations or cancer. Typical worker exposures do not result in a level of concern. The SERA report concluded that workers and the general public would not be at any substantial risk from exposure to metsulfuron methyl. Studies on bees, birds, fish, microorganisms, and aquatic invertebrates show similarly low toxicity. However, non-target terrestrial and aquatic plants are sensitive to metsulfuron methyl.

DVCD would only use herbicides registered by the EPA, and herbicide use would follow all label instructions, BMPs, and any additional requirements from NDEP. Label instructions include constraints on applications under certain wind, temperature, precipitation, and other weather conditions to eliminate spray drift, volatilization, leaching, or runoff. DVCD applicators would use personal protective equipment (PPE) in accordance with MSDS and SDS. Herbicides proposed for use in the DVCD project are toxic to plants, but are essentially non-toxic to humans and other mammals, birds, insects, earthworms, and soil microorganisms. The mode of action for herbicides is to disrupt plant photosynthesis, respiration, cell division, amino acid synthesis, or growth hormones (Table 2). No plant enzymes are used in wildlife or human metabolism.

3.8.2 Environmental Consequences

No Action

If Reclamation does not allow DVCD to use NFWF sub-grant funding to treat noxious and invasive weeds and restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation, there would be no direct or indirect exposure of wildlife, humans, or non-target plants to herbicides as a result of the proposed project.

Proposed Action

If Reclamation allows DVCD to use NFWF sub-grant funding to control noxious and invasive weeds and restore 451 acres of the Middle Carson River floodplain to native and desirable vegetation there would be limited potential herbicide exposure to humans or wildlife. Herbicide labels, MSDS, SDS, and BMPs outlined in this EA would be followed for all herbicide applications in the proposed project area. The greatest potential risk to humans is for workers applying 2,4-D. The strict use of clean PPE, careful herbicide handling, worker education, and safety oversight is expected to minimize the risk of any adverse effects to workers. Posting signs at entry points for treated areas which are used by the general public and making direct contacts with participating landowners would reduce or eliminate potential exposure of the public and domestic dogs.

Terrestrial and aquatic wildlife would not be exposed to toxic levels of herbicides except by accidental spills or possible direct ingestion of large amounts of vegetation recently sprayed with 2,4-D by individual terrestrial wildlife. These scenarios are unlikely given that a spill containment plan would be implemented, and the target weeds are not desirable forage for wildlife, so any effects would be expected to be sub-lethal. Non-target terrestrial (primarily broadleaf and woody species) and aquatic plants would be susceptible to damage or mortality from unintended movement of any of the herbicides. Use of the proper application equipment, trained workers, BMPs, label instructions, and site-specific measures (weather, soils, spill kits,

avoiding water and native vegetation, *etc.*) would minimize adverse effects to non-target vegetation.

3.9 Cultural Resources

3.9.1 Affected Environment

Definitions and Regulations

Cultural resources are defined as prehistoric and historic sites, buildings, structures, objects, districts, cultural landscapes, sacred sites, and traditional cultural properties. Cultural resources include both archaeological sites depicting evidence of past human use of the landscape and the built environment represented in structures such as dams, canals, and buildings. Within the broad range of cultural resources are those that have recognized significance, which are called historic properties. The NHPA of 1966 (54 U.S.C. §300101 *et seq.*), as amended, is the primary legislation that defines the Federal government's responsibility to cultural resources. Section 106 of the NHPA requires that Federal agencies take into consideration the effects of their undertakings on historic properties. Under Title 54 USC §306108, commonly known as Section 106 of the NHPA, historic properties are defined as cultural resources that are listed on or eligible for inclusion in the National Register of Historic Places (National Register). The 36 CFR §800 regulations implement Section 106 of the NHPA and outline the procedures necessary for compliance with the NHPA.

Cultural Resources Inventory

A confidential cultural resources report, bound under separate cover, documents the scope and results of a cultural resources inventory done on the Proposed Action area. Great Basin Consulting Group, a DVCD contractor, conducted a literature review, pre-field records search, and pedestrian survey as part of a Class III cultural resources inventory to identify and document cultural resources that could be affected by the proposed project (Drews and Branch 2015). The Class III reconnaissance was conducted to comply with Reclamation policies and Section 106 of the NHPA. Field methods followed Reclamation's Mid-Pacific Region cultural resource guidelines (Reclamation 2012, 2013). Reclamation also invited the Fallon Paiute-Shoshone Tribe's participation in the Section 106 process and requested information under Section 106 of the NHPA regarding the identification of, or concerns with, cultural resources including sites of religious and cultural significance.

Area of Potential Effect

The project Area of Potential Effect (APE) is the "footprint" of the proposed treatment parcels, which consists entirely of active and former agricultural fields within the Carson River floodplain. Access to the treatment parcels would be via existing roads. Ditches, roads, and other agricultural features are not part of the APE. However, indirect effects to any historic properties within a 0.25-mile buffer of the APE were considered.

Archival Review

Prior to their field inventory, Great Basin Consulting Group conducted an archival search for sites and inventories within 1 mile of the project area through the Nevada Cultural Resources Information System (NVCRIS). The NVCRIS query identified 46 prehistoric and historic sites (Drews and Branch 2015). The prehistoric sites are predominantly isolated artifacts, campsites,

and lithic scatters. Historic sites are associated with early development of the area in the late 1800s and early 1900s and are located on the higher terraces above the floodplain.

In addition to NVCRIS, Great Basin Consulting Group examined General Land Office (GLO) plat maps for evidence of potential historic resources in or near the project area (Drews and Branch 2015). These include the town of Dayton with many named structures in the surrounding sections including the Illinois Mill and the Rocky Point Mill; the “Road to Fort Churchill,” which ran along the north edge of the proposed treatment parcels; and the “Overland Road from Dayton to Reese River,” which was less than 1 mile north of the project area. The alignments for the Pony Express Trail and the Carson River Route of the California Emigrant Trail followed the “Road to Fort Churchill” (approximate alignment of River Road and Fort Churchill Road), and both are listed as National Historic Trails. Although they are in proximity (0.25 mile) to the northern periphery of most proposed treatment parcels, these trails lie up on the floodplain terrace outside of the APE. Therefore, neither trail has been recorded as an archaeological resource within the project vicinity.

Much of the project area is depicted on the GLO plat maps as containing fields, irrigation ditches, fences, and sloughs (Drews and Branch 2015). A network of dams and ditches historically supplied water from the Carson River to Comstock Lode mills and ranches (see section **3.5.1 Affected Environment**). Several of these historic ditches are in the immediate project area vicinity and still supply irrigation water to some of the 12 parcels. No treatment activities are proposed for these ditches. However, the ditches were treated as eligible properties for the National Register for the purpose of evaluating visual effects.

Ethnographic Overview

The generally recognized geographic boundary between the Northern Paiute and Washoe Tribes is the Pine Nut Mountains. The project area falls within Northern Paiute territory, which covers an extensive area of the western Great Basin. The Paiute subsisted on fish, seeds, berries, and waterfowl in the summer. In the fall, pine nut harvesting and communal drives for rabbits and waterfowl, including coots (*Fulica americana*), took place. Stored food and some hunting and fishing sustained Paiute populations in the winter.

Historic Overview

Euro-American exploration of the Middle Carson River area began in the early 1800s. Emigrants began using the Carson River Route in 1848 to travel to California. Gold was discovered near Dayton in 1849, and the area became populated with miners. By the early 1850s the Carson Route was the primary mail route between California and the rest of the United States. Rail and telegraph lines followed this route, as well as the Pony Express Trail starting in 1861. Development in Dayton followed the boom and bust cycle of the Comstock Lode mining. The floodplain was developed for agricultural use in the 1860s (Drews and Branch 2015).

Summary

Reclamation is proposing to provide DTL Program grant funding to DVCD to reestablish native and desirable vegetation and habitat on multiple properties along the Middle Carson River in Lyon County Nevada. The Proposed Action is the type of activity that has the potential to affect historic properties. No historic properties were identified within the project APE. Based on all

of the available information, Reclamation reached a finding of no historic properties affected pursuant to 36 CFR §800.4(d)(1). Concurrence from the Nevada SHPO is currently pending.

3.9.2 Environmental Consequences

No Action

Under the No Action alternative, Reclamation would not provide funding to DVCD to control invasive and noxious weeds using mowing and herbicide applications, and no seeding of native and desirable vegetation would occur. Under the No Action alternative, Reclamation would not have an undertaking as defined by Section 301(7) of the NHPA.

Proposed Action

Reclamation identified five isolated, non-significant prehistoric and historic artifacts within the APE. Unevaluated National Historic Trails and historic ditches that are present within the 0.25-mile visual APE were treated as historic properties. Reclamation applied the criteria of adverse effect (36 CFR §800.5(a)(1)) and Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (National Park Service 1983) to the historic properties. The criteria of adverse effect state: "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative."

The entire proposed project would take place on active or retired agricultural land, most of which has been actively farmed or ranched for at least 100 years. Ground disturbing activities are primarily limited to mowing and seeding with some potential additional minor surface disturbance from vehicle and equipment tires. Considering that the proposed treatment would restore the area to natural conditions while maintaining the agricultural appearance, the proposed project would have no adverse visual effect on nearby historic properties.

In the event of an unanticipated discovery of unknown cultural resources during project implementation, Reclamation would immediately be notified and any ground-disturbing activities within 50 ft of the discovery would be stopped until the find can be inspected by a qualified archaeologist, and avoidance or recovery measures can be developed in consultation with Reclamation, as outlined at 36 CFR §800.13. Work would not resume at that specific location until authorized by Reclamation.

Based on the above inventory and documentation, Reclamation has reached a finding of no historic properties affected for this undertaking, pursuant to 36 CFR §800.5(b).

3.10 Indian Trust Assets

3.10.1 Affected Environment

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for recognized Indian Tribes or individuals. The Secretary of the Interior, acting as the trustee, holds

many assets in trust. Examples of objects that may be trust assets are lands, minerals, hunting and fishing rights, and water rights. While most ITAs are on reservations, they may also be found off-reservations. Potential trust resources within the proposed project area include native plants and wildlife associated with the river and riparian habitat. These resources exist on private and public lands within the proposed project area.

The Fallon Paiute-Shoshone Tribe is also known as the Toi Ticutta (cattail eaters) because of the major role cattails (*Typha* sp.) had in their traditional diets. With a 9,000-year history, the original territory of the Fallon Paiute-Shoshone Tribe centered around the current day Stillwater Marsh and Fallon area, including approximately 50 miles along the Carson River (CWSD 2007). Since reservation establishment in the late-1800s, the Fallon Paiute-Shoshone Tribe has experienced a series of reservation expansions and federal legal settlements over land and water rights issues. The headquarters of the Fallon Paiute-Shoshone Tribe is located in Fallon, Nevada.

The Washoe Tribe's headquarters is located in Gardnerville, Nevada. The Washoe Tribe has jurisdiction over trust allotments in both Nevada and California, with additional Tribal Trust parcels located in Alpine, Placer, Sierra, Douglas, Carson, and Washoe Counties. Tribal history extends an estimated 7,000–9,000 years in the Lake Tahoe basin and adjacent east and west slopes and valleys of the Sierra Nevada (Washoe Tribe 2009, 2014). Prior to modern times the Washoe people, who called themselves “Wa She Shu,” followed seasonal habitation patterns covering several hundred miles between Lake Tahoe and winter encampments in the lower elevations to the east, including Washoe, Eagle, and Carson Valleys (CWSD 2007, Reno-Sparks Indian Colony 2015). The Washoe people utilized resources in the watershed including game, waterfowl and aquatic resources. Vegetation was used for medicinal and utilitarian purposes, including baskets made from riparian vegetation. The Washoe Tribe has partnered with federal, state, and local governments on water quality, air quality, and bank stabilization projects in the Carson River and Clear Creek watersheds. The Washoe Environmental Protection Department, established in 1998, works to ensure the protection of traditional Washoe Tribe natural resources, including traditional gathering areas and native vegetation (CWSD 2007).

Reservation lands for the Reno-Sparks Indian Colony include approximately 2,000 acres in Washoe County, Nevada, and the tribal headquarters are located in Reno, Nevada. The Reno-Sparks Indian Colony has members from the Numu (Paiute), Newe (Shoshone), and Washeshu (Washo). The Numu band of the Northern Paiute occupied western Nevada and portions of Idaho and Oregon (Reno-Sparks Indian Colony 2015). The Reno-Sparks Indian Colony's Tribal Council passed Resolution 2015-RS-29 on April 15, 2015, that provides an official “Areas of Cultural Interest” map to Federal agencies. This map includes much of northwestern Nevada and areas of northeastern California; it includes the entire Carson River watershed in Nevada.

3.10.2 Environmental Consequences

No Action

If the proposed project is not implemented, 451 acres of Middle Carson River floodplain would continue to be dominated by invasive and noxious weeds rather than native and desirable vegetation. Resources important to the Fallon Paiute-Shoshone Tribe, Reno-Sparks Indian Colony, and Washoe Tribe would not benefit from these habitat restoration activities. Areas

dominated by weeds would not begin the process of long-term succession to a diverse native riparian ecosystem that would have the highest value ITAs.

Proposed Action

Implementation of the proposed project would have a positive effect on ITAs because non-native weeds with no ITA value would be controlled or eliminated and replaced with native and desirable vegetation that would support a diversity of wildlife. Accessibility to the river and riparian areas on public lands for tribal members would improve when dense weed infestations are controlled or eliminated. Opportunities for long-term succession to native shrubs and trees would improve as weeds are controlled or eliminated. Water quality and river bank stability would be positively affected over the long term by the transition from weeds to native and desirable vegetation.

3.11 Environmental Justice

Executive Order 12898 requires each federal agency to achieve environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including social and economic effects, of its programs, policies, and activities on minority and low-income populations. EPA guidelines for evaluating potential adverse environmental effects of projects require identification of minority populations when a minority population either exceeds 50 percent of the population of the affected area or represents a meaningfully greater increment of the affected population than of the population of some other appropriate geographic unit. The closest and most relevant population to the project area is Dayton, Nevada.

The race, ethnicity, and poverty data reported in this section were acquired from the U.S. Census Bureau's QuickFacts and were last revised on February 5, 2015 (U.S. Census Bureau 2015a, 2015b). Dayton, Carson City/County, and Nevada are generally comparable in key demographic parameters, although Dayton has the lowest percentage of minority residents (Table 4). The proposed project would enhance the ecological, wildlife, and recreational values of the treated areas. Residents of Dayton and Carson City/County would be the primary beneficiaries. Based on the available data, environmental justice would not be affected by the proposed project.

Table 4. Selected Demographics of Dayton, Carson City/County, and the State of Nevada (U.S. Census Bureau 2015a, 2015b).

Demographic	Dayton	Carson City/County	Nevada
White Alone and Not Hispanic, 2010	78.4%	70.7%	54.1%
Total Racial and Ethnic Minorities, 2010	21.6%	29.3%	45.9%
Persons below poverty level, 2009–2013	14.1%	16.2%	15.0%
Median household income, 2009–2013	\$50,500	\$51,957	\$52,800

3.12 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable resource commitments involve the use of nonrenewable resources and the effects of their use on future generations. Irreversible effects primarily result from the use or destruction of specific resources that cannot be replaced within a reasonable time frame,

such as energy and minerals. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action, such as extinction of a threatened or endangered species or the disturbance of a cultural resource.

Implementation of the proposed action would require minor irreversible and irretrievable commitments of fossil fuels (diesel, gasoline, oils, and hydraulic lubricants) used by vehicles and equipment. However, neither the proposed action nor the No Action alternative would result in a significant commitment of nonrenewable resources, unavoidable loss of habitat, harm or harassment of wildlife, or negative changes to other resources resulting from disturbance of the land surface.

3.13 Cumulative Impacts

Cumulative impacts are those that result “from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR §1508.7). This section discusses cumulative impacts as the combination of effects to specific resources that would occur as a result of the proposed action along with other past, present, and reasonably foreseeable future actions on or within 0.25-mile of the proposed treatment parcels.

The Middle Carson River has long benefited from a strong local coalition of agencies, landowners, and local citizens working together on and cooperatively funding restoration projects. An example of this cooperation was the formation of a Cooperative Weed Management Area along the Middle Carson River. Projects in the floodplain and on the river follow guidance and goals from specific plans (*e.g.*, JBR Environmental Consultants 2012, CWSD 2015b).

A large partnership project in progress is the Rolling A Ranch Park restoration. Lyon County Open Space acquired the former ranch property and implemented a variety of recreation enhancements including trails, river access, and a Frisbee golf course. In addition, some river bank slopes have been stabilized with toe protection and planted with riparian vegetation. In 2010, DVCD mapped and sprayed 180 acres of perennial pepperweed, hoary cress, Scotch thistle, Canada thistle, tamarisk, and Russian knapweed on the property. DVCD also used a drag harrow for site preparation and then broadcast seeded native vegetation on approximately 7.5 acres; DVCD drill seeded an additional 100 acres with native species to suppress new weed infestations. DVCD worked with a non-profit group (River Wranglers) to plant willow poles along the river. The Lyon County Fire Department assisted by burning dead weeds. DVCD is currently working with NDA to implement biological controls (beetles) to eradicate Russian knapweed. Parcel 10a of the proposed project would be a continuation of the Rolling A Ranch Park habitat restoration work.

3.13.1 Reasonably Foreseeable Future Actions

Based on personal communications with DVCD (Wilkinson 2015), no known projects are planned within the region of influence. However, DVCD will continue to look for restoration project sites each year and prioritize areas that need the most work.

3.13.2 Cumulative Effects

Cumulative effects would result from the impacts of implementation of the proposed action along with the other past, present, and reasonably foreseeable future actions. Cumulative effects to cultural resources could occur if unanticipated discoveries were made; however, based on the detailed Class III cultural inventory (Drews and Branch 2015) and the lack of historic properties, cultural resource impacts are anticipated to be negligible. Based on the relatively minor ground surface disturbance compared with past agricultural cultivation practices; the limited overlap of a single parcel (10a) with ongoing restoration projects; the short-term and intermittent treatment activities over the 1 year period of the proposed action; avoidance of existing native and desirable vegetation; the use of low toxicity herbicides/active ingredients; the relatively undeveloped floodplain; adherence to herbicide label instructions; and the use of PPE, MSDS, SDS, and BMPs; cumulative adverse effects to native vegetation, wildlife, geology and soils, water resources, air quality and noise, health and safety, ITA, and environmental justice are expected to be negligible. Beneficial cumulative impacts would be anticipated for native vegetation, wildlife, soils, water resources, and ITA through continuation/expansion of weed treatments and native vegetation seedings on the Rolling A Ranch Park/Lyon County Open Space property (Parcel 10a).

Chapter 4 – Consultation and Coordination

This chapter describes the consultation and coordination activities Reclamation has carried out with interested agencies, organizations, tribes, and individuals while preparing the EA. The NEPA and CEQ regulations require the public's involvement in the decision-making process, as well as allow for full environmental disclosure. Chapter 7 contains the relevant scoping and consultation documents.

A scoping letter and proposed project area map were distributed by Reclamation to 11 interested parties on November 7, 2014. Reclamation also sent letters and maps to the Fallon Paiute-Shoshone Tribe and Washoe Tribe on November 7, 2014. Reclamation's letters requested comments, concerns, or issues regarding the proposed project. On November 13, 2014, the Nevada State Clearinghouse sent an email regarding the proposed project to 70 stakeholder entities (Notice E2015-066; Canfield 2014a). The email requested an evaluation of the project's effects on agency plans and programs and any other issues that might be pertinent to applicable laws and regulations.

The Nevada State Clearinghouse did not receive any formal agency comments on the proposed project, but the State Land Use Planning agency expressed its support (Canfield 2014b). Reclamation received one letter dated November 17, 2014, from the National Trails Intermountain Region (NTIR) of the National Park Service (Kreutzer 2014). The letter noted that the California and Pony Express National Historic Trails run along the Carson River in the vicinity of the project area. NTIR supports restoring native vegetation, but requested that any trail remnants be protected from ground-disturbing activities.

As suggested by NTIR, Trails West, Inc., a non-profit, volunteer organization that conducts emigrant trail research, survey, and marking activities, was contacted for specific local trail information. Trails West acknowledged that the trail route went through the general area of the

proposed action, but that a century of farming, grazing, flooding, house, and road building has obliterated any physical evidence (Bishell 2014, Drews 2015). If present, any historic trail segments within the agricultural fields associated with the proposed project already would have been destroyed (Drews 2015). However, the GLO plat maps show the trail along River Road, which is higher in elevation than the floodplain terrace on which the proposed project would be implemented (Drews 2015).

Endangered Species Act

Reclamation has determined that the proposed action will have no effect on federally-listed, proposed or candidate species, or proposed or designated critical habitat. Thus, ESA section 7 consultation is not required (USFWS and National Marine Fisheries Service 1998).

Chapter 5 – List of Preparers

Specialists from Reclamation have reviewed and approved the analysis contained within this EA, as well as provided document preparation oversight. DVCD provided technical information and factual review. The following individuals were involved in the preparation of this EA:

- Jane LaBoa, Blue Palm Consulting, NEPA Contractor for DVCD;
- Selena Werdon, Natural Resource Specialist, Reclamation;
- Caryn Hunt DeCarlo, Desert Terminal Lakes Program Manager, Reclamation;
- Scott Williams, Archaeologist, Reclamation;
- Richard Wilkinson, District Manager (former), DVCD; and
- Rob Holley, District Manager (current)/Coordinator, DVCD.

Chapter 6 – References

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Chapter 7 – Scoping Letters and Responses

NOV 07 2014

LO-660
ENV-6.00

Interested Parties (See Enclosed List)

Subject: National Environmental Policy Act (NEPA) Process for the Dayton Valley Conservation District's Carson River Floodplain Rehabilitation and Habitat Restoration Project, Lyon County, Nevada

Dear Ladies and Gentlemen:

The Bureau of Reclamation invites you to participate in the NEPA scoping process for the preparation of an environmental assessment (EA) on the proposed Carson River Floodplain Rehabilitation and Habitat Restoration Project. This letter is a request for comments, concerns, or issues related to this proposed project.

The proposed action is to allow the Dayton Valley Conservation District (DVCD) to use federal grant funding to implement treatments for control of noxious and invasive plants and reestablishment of native vegetation to improve wildlife habitat and water quality along the main stem Middle Carson River. These treatments would be implemented on floodplain lands that were historically ranched or farmed that have existing weed and/or soil erosion issues. A general project area map is enclosed. Reclamation has a Desert Terminal Lakes Program grant with the National Fish and Wildlife Foundation (NFWF). NFWF provides a portion of this grant funding as subgrants for conservation projects, including to the DVCD for the subject project. An EA is being prepared to assess the potential environmental impacts resulting from the proposed project.

Reclamation encourages your participation in this scoping process. Written comments may be submitted through November 28, 2014, by mail to:

Ms. Selena Werdon
Natural Resource Specialist
Bureau of Reclamation
705 N. Plaza Street, Suite 320
Carson City, Nevada 89701
Fax: 775-882-7592
E-mail: swerdon@usbr.gov

For additional information, please contact Ms. Werdon at 775-884-8366.

Sincerely,

A handwritten signature in dark ink, appearing to read 'R. Edwards', with a stylized flourish at the end.

For: Robert J. Edwards
Resources Division Manager

Enclosure

WBR:SWerdon:kgibson:11/07/14:775-884-8366
v:\correspondence\2014\werdon\11-07-14 dvcd int parties.docx

INTERESTED PARTIES

Mr. Edward Koch
State Supervisor
U.S. Fish and Wildlife Service
1340 Financial Blvd., Suite 234
Reno, Nevada 89502

Ms. Nancy Hoffman
Project Leader
Stillwater National Wildlife Refuge Complex
1020 New River Parkway, Suite 305
Fallon, Nevada 89406-2613

Mr. Jeff Page
Lyon County Emergency Mgmt Coordinator
27 S. Main Street
Yerington, Nevada 89447

Mr. Skip Canfield
Nevada State Clearinghouse
Dept. of Conservation & Natural Resources
901 S. Stewart St., Suite 5003
Carson City, Nevada 89701

Mr. Rusty Jardine
District Manager
Truckee-Carson Irrigation District
P.O. Box 1356
Fallon, Nevada 89407-1356

Ms. Kristine Hansen
Regulatory Project Manager
Reno Regulatory Field Office
Sacramento District, USACE
Clifton Young Federal Building
Nevada State Office
300 Booth St., Room 3060
Reno, Nevada 89509

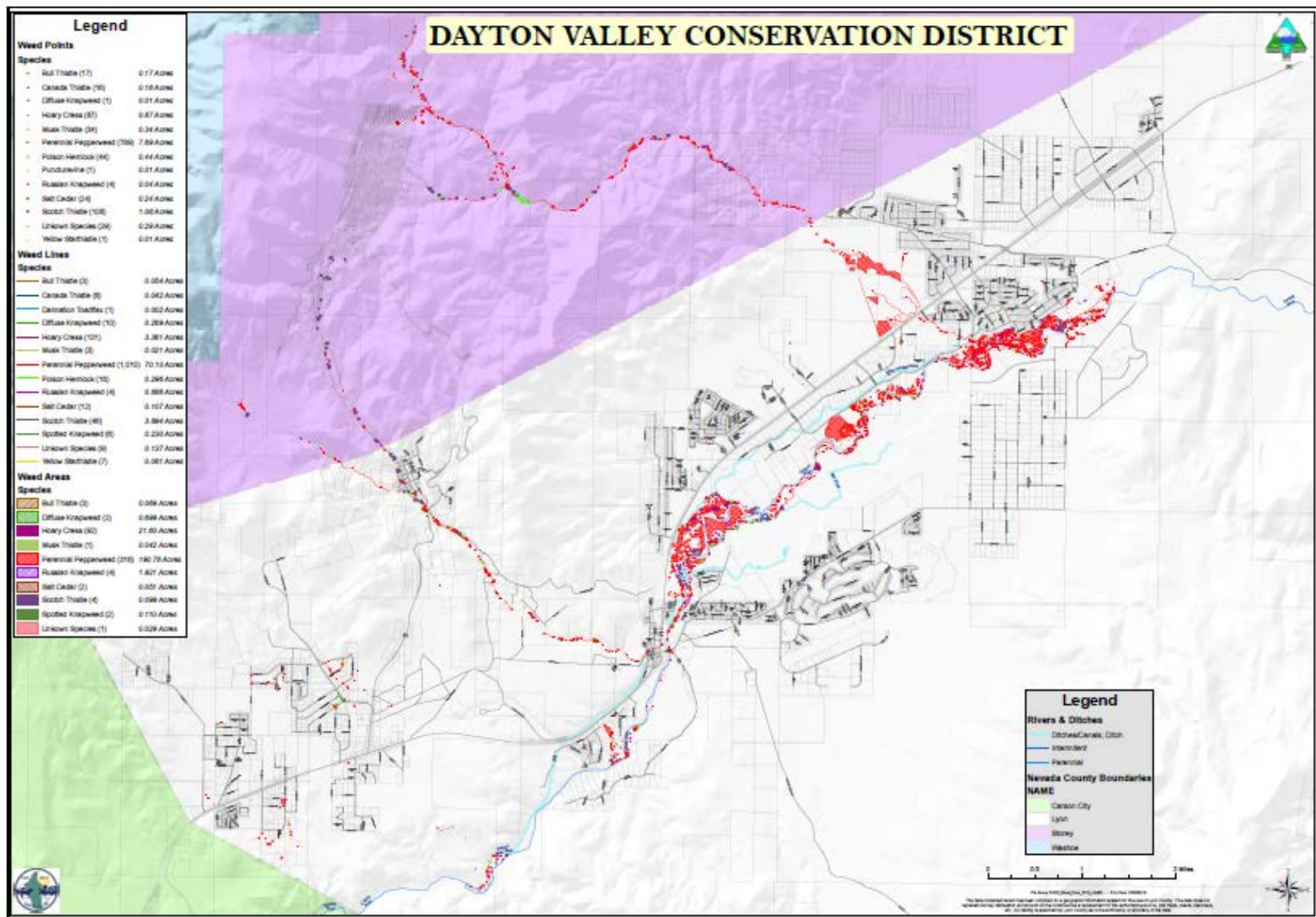
Mr. Raul Morales
Deputy State Director
Natural Resources
Bureau of Land Management
1340 Financial Blvd.
Reno, Nevada 89502-7147

Ms. Lee Kreutzer
Archaeologist
National Trails Intermountain Region
324 South State St.
Salt Lake City, Utah 84111

Ms. Kathleen Johnson
Director, Enforcement Division
U.S. Environmental Protection Agency
Pacific Southwest Office
75 Hawthorne St.
San Francisco, California 94105

Mr. Ed James
General Manager
Carson Water Subconservancy District
777 E. William Street, Suite 110A
Carson City, Nevada 89701

Ms. Betty Hodik
County Executive Director
Lyon County Farm Service Agency
215 W. Bridge St., Suite 11A
Yerington, Nevada 89447-2544





United States Department of the Interior

BUREAU OF RECLAMATION

Lahontan Basin Area Office
705 N. Plaza Street, Rm 320
Carson City, NV 89701

NOV 07 2014

IN REPLY REFER TO

LO-660
ENV-6.00

Honorable Len George
Chairman
Fallon Paiute-Shoshone Tribe
565 Rio Vista Drive
Fallon, Nevada 89406

Subject: National Environmental Policy Act (NEPA) Process for the Dayton Valley Conservation District's Carson River Floodplain Rehabilitation and Habitat Restoration Project, Lyon County, Nevada

Dear Chairman George:

The Bureau of Reclamation invites you to participate in the NEPA scoping process for the preparation of an environmental assessment (EA) on the proposed Carson River Floodplain Rehabilitation and Habitat Restoration Project. This letter is a request for comments, concerns, or issues related to this proposed project.

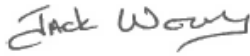
The proposed action is to allow the Dayton Valley Conservation District (DVCD) to use federal grant funding to implement treatments for control of noxious and invasive plants and reestablishment of native vegetation to improve wildlife habitat and water quality along the main stem Middle Carson River. These treatments would be implemented on floodplain lands that were historically ranched or farmed that have existing weed and/or soil erosion issues. A general project area map is enclosed. Reclamation has a Desert Terminal Lakes Program grant with the National Fish and Wildlife Foundation (NFWF). NFWF provides a portion of this grant funding as subgrants for conservation projects, including to the DVCD for the subject project. An EA is being prepared to assess the potential environmental impacts resulting from the proposed project.

Reclamation encourages your participation in this scoping process. Written comments may be submitted through November 28, 2014, by mail to:

Ms. Selena Werdon
Natural Resources Specialist
Bureau of Reclamation
705 N. Plaza Street, Suite 320
Carson City, Nevada 89701
Fax: 775-882-7592
E-Mail: swerdon@usbr.gov

For additional information, please contact Ms. Werdon at 775-884-8366.

Sincerely,

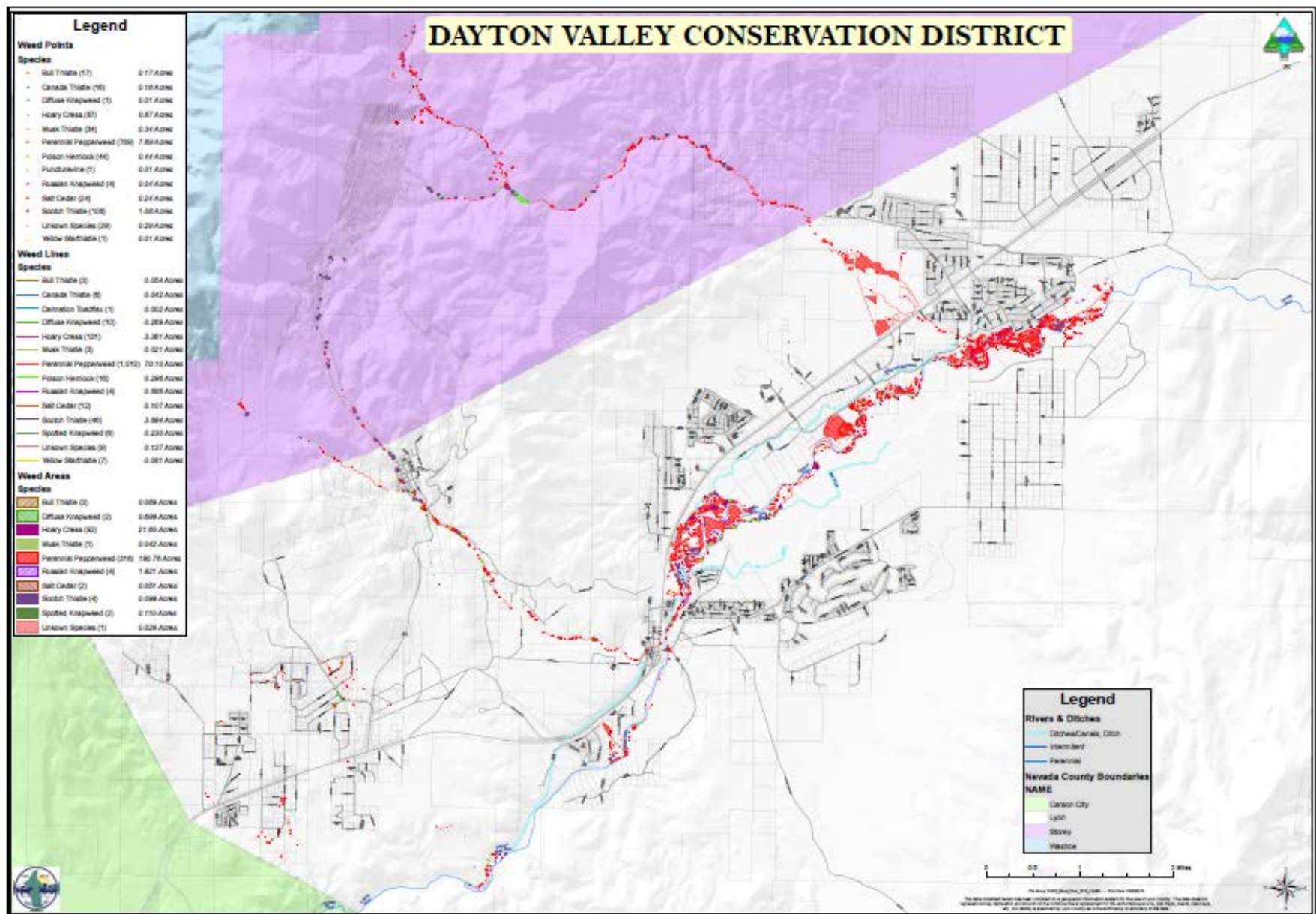


Acting For: Terri A. Edwards
Area Manager

Enclosure

cc: Ms. Marilyn Bitisillie (w/o Encl)
Acting Superintendent
Bureau of Indian Affairs
Western Nevada Agency
311 E. Washington Street
Carson City, Nevada 89701

Ms. Cathy Wilson (w/o Encl)
Water Rights Specialist
Bureau of Indian Affairs
Western Region
Division of Natural Resources, MS-460
2600 N. Central Ave., 4th Floor
Phoenix, Arizona 85004





IN REPLY REFER TO

United States Department of the Interior

BUREAU OF RECLAMATION

Lahontan Basin Area Office
705 N. Plaza Street, Rm 320
Carson City, NV 89701

NOV 07 2014

LO-660
ENV-6.00

Honorable Darrel Kizer
Chairman
Washoe Tribe of Nevada and California
919 U.S. Highway 395 South
Gardnerville, Nevada 89410

Subject: National Environmental Policy Act (NEPA) Process for the Dayton Valley Conservation District's Carson River Floodplain Rehabilitation and Habitat Restoration Project, Lyon County, Nevada

Dear Chairman Kizer:

The Bureau of Reclamation invites you to participate in the NEPA scoping process for the preparation of an environmental assessment (EA) on the proposed Carson River Floodplain Rehabilitation and Habitat Restoration Project. This letter is a request for comments, concerns, or issues related to this proposed project.

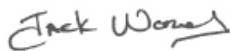
The proposed action is to allow the Dayton Valley Conservation District (DVCD) to use federal grant funding to implement treatments for control of noxious and invasive plants and reestablishment of native vegetation to improve wildlife habitat and water quality along the main stem Middle Carson River. These treatments would be implemented on floodplain lands that were historically ranched or farmed that have existing weed and/or soil erosion issues. A general project area map is enclosed. Reclamation has a Desert Terminal Lakes Program grant with the National Fish and Wildlife Foundation (NFWF). NFWF provides a portion of this grant funding as subgrants for conservation projects, including to the DVCD for the subject project. An EA is being prepared to assess the potential environmental impacts resulting from the proposed project.

Reclamation encourages your participation in this scoping process. Written comments may be submitted through November 28, 2014, by mail to:

Ms. Selena Werdon
Natural Resources Specialist
Bureau of Reclamation
705 N. Plaza Street, Suite 320
Carson City, Nevada 89701
Fax: 775-882-7592
E-Mail: swerdon@usbr.gov

For additional information, please contact Ms. Werdon at 775-884-8366.

Sincerely,

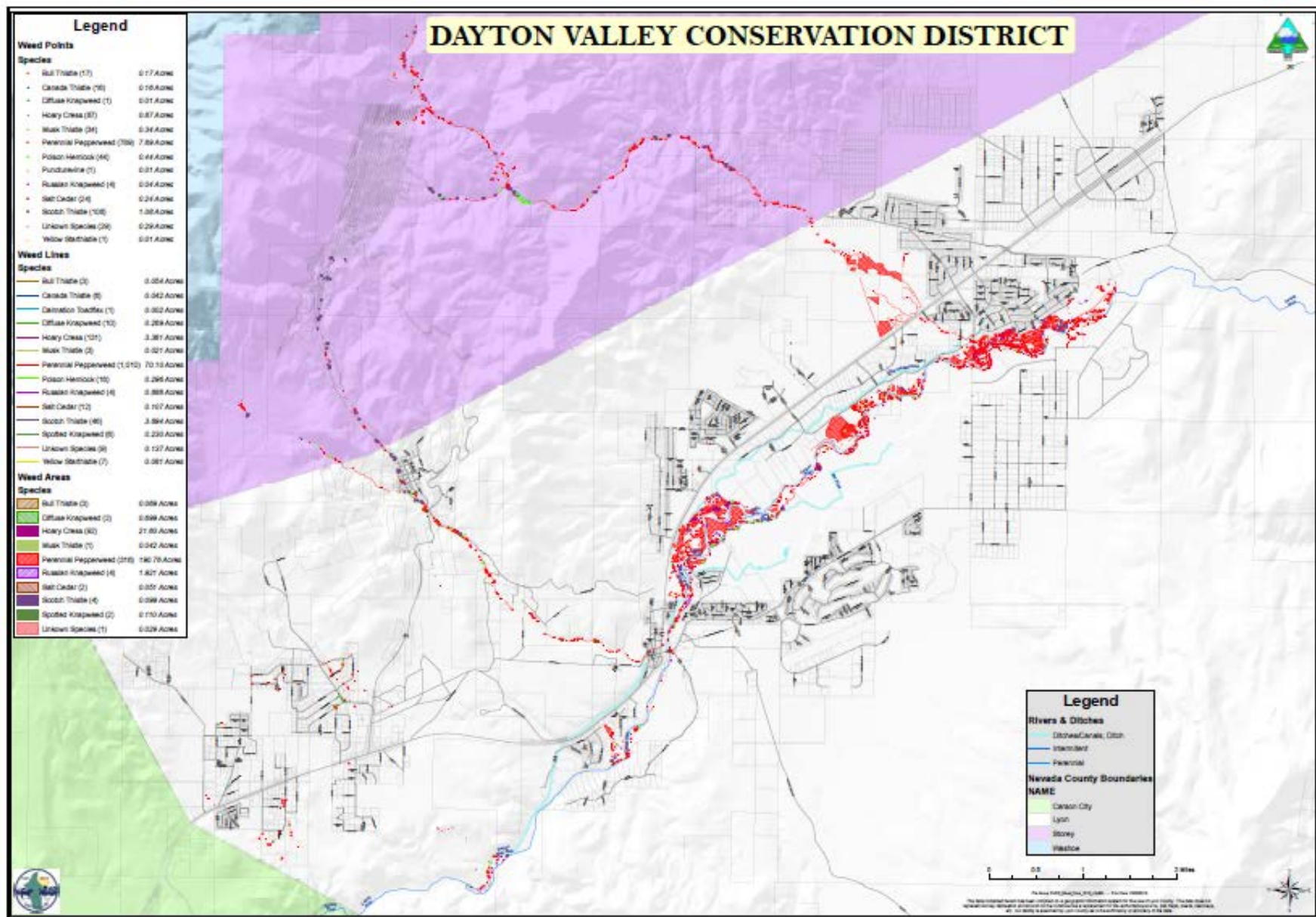


Acting For: Terri A. Edwards
Area Manager

Enclosure

cc: Ms. Marilyn Bitisillie
Acting Superintendent
Bureau of Indian Affairs
Western Nevada Agency
311 E. Washington Street
Carson City, Nevada 89701

Ms. Cathy Wilson
Water Rights Specialist
Bureau of Indian Affairs
Western Region
Division of Natural Resources, MS-460
2600 N. Central Ave., 4th Floor
Phoenix, Arizona 85004



Post-It® Fax Note	7871	Date	11/17/2014	Page	2
To	S. Werdon	From	L. Kreutzer		
Co./Dept.	BOR	Co.	NPS		
Phone #		Phone #	801-741-1012-18		
Fax #		Fax #			

RECEIVED

NOV 18 2014

BUREAU OF RECLAMATION
LAHONTAN BASIN AREA OFFICE

United States Department of the Interior



NATIONAL PARK SERVICE
National Trails Intermountain Region
Branch Office
324 South State Street, Suite 200
Salt Lake City, Utah 84111



IN REPLY REFER TO:

November 17, 2014

Ms. Selena Werdon, Natural Resource Specialist
Bureau of Reclamation
705 N. Plaza Street, Ste. 320
Carson City, NV 89701

Dear Ms. Werdon:

Thank you for contacting this office, National Trails Intermountain Region (NTIR), of the National Park Service as part of your scoping effort for the proposed Carson River Floodplain Rehabilitation and Habitat Restoration Project.

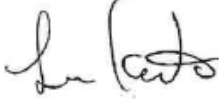
NTIR administers the California and Pony Express National Historic Trails, both of which run along the Carson River through the project area. We have no information regarding any intact trail remnants or features in that area; however, that stretch is formally identified as a High Potential Segment, which the National Trails System Act defines as "those segments of a trail which would afford a high quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route." If you would like GIS data layers for the trails in that area, please contact GIS Specialist Derek Nelson at derek_j_nelson@nps.gov.

Restoration of the historic native vegetation through this corridor would be beneficial to that high potential segment of the two trails. Please be aware, however, that actual historic trail remnants and related features could potentially exist in the general vicinity of the Carson River, and those should be protected during any ground disturbing activities that might occur during restoration. Two trails groups, in particular, conduct trail research, survey, and marking activities in your area, and they may have knowledge of specific resources there: Trails West, Inc., and the Oregon-California Trails Association. One or both of those organizations have already placed historical markers along the route (for example, see Trails West, Inc.'s *Carson Trail Driving Guide*).

General contact information for them is available on line, but I would be happy to help you reach out to organizational or chapter officers through my contacts within those associations.

If you would like such assistance or have questions about the trails, please contact me at lee_kreutzer@nps.gov or by phone at 801-741-1012 ext. 118.

Sincerely,

A handwritten signature in black ink, appearing to read 'Lee Kreutzer', written over a faint horizontal line.

Lee Kreutzer
Cultural Resources Specialist



Werdon, Selena <swerdon@usbr.gov>

State Agency Comments E2015-066 Scoping - EA - Carson River Floodplain Rehab and Habitat Restoration

1 message

Skip Canfield <scanfield@lands.nv.gov>
To: "swerdon@usbr.gov" <swerdon@usbr.gov>
Cc: Skip Canfield <scanfield@lands.nv.gov>

Mon, Dec 1, 2014 at 9:51 AM

The Nevada State Clearinghouse did not receive any agency feedback on this project;

<http://clearinghouse.nv.gov/public/Notice/2015/E2015-066.pdf>

Speaking for the State Land Use Planning Agency, I support this project and your efforts.

-Skip

Skip Canfield

Nevada State Clearinghouse

State Land Use Planning Agency

Nevada Division of State Lands

Department of Conservation and Natural Resources

901 South Stewart Street, Suite 5003

Carson City, NV 89701

775-684-2723

<http://clearinghouse.nv.gov>

www.lands.nv.gov