

**ANNUAL REPORT  
(Period of July 1, 2011 to June 30, 2012)**

On Activities Associated With the  
**Carson River Watershed  
REGIONAL FLOODPLAIN MANAGEMENT PLAN**

Submitted for:

**DOUGLAS COUNTY  
and  
CARSON CITY  
and  
STOREY COUNTY**

Prepared by:

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## **1.0 Background**

In 2008, five counties along the Carson River adopted a Regional Floodplain Management Plan (Regional Plan) that would provide consistency in planning efforts, programs and projects, help protect community members from flooding hazards, and conserve floodplain lands. This plan was formally adopted by Douglas, Carson City, Lyon, and Churchill Counties in Nevada, and Alpine County in California. Although a small portion of Storey County is within the Carson River Watershed, they have not formally adopted the Regional Floodplain Management Plan.

Of these counties, Carson City, Douglas and Storey County participate in the Community Rating System (CRS) program.

The purpose of the plan is to create long-term vision and strategies for floodplain management to reduce flood damage impacts. The plan objectives include the following:

- Manage economic development without sacrificing floodplain and river form and function;
- Ensure public safety upstream and downstream;
- Protect property rights while conserving natural resources;
- Protect and improve wildlife habitat and water quality;
- Provide and maintain river continuity and connection of the river to its floodplain;
- Promote conservation of lands within the river corridor.

Responsible parties have been identified for implementation of the plan, and existing or potential funding sources have also been identified.

## **2.0 Activities Conducted for this Reporting Period**

This report details work initiated and/or completed through the Carson Water Subconservancy District (CWSD) and/or the programs administered through CWSD in relation to the Regional Plan.

### **2.1 Stakeholder Involvement**

Several stakeholder groups provide watershed level input and assistance in the implementation of the Regional Plan.

#### **2.1.a Carson River Coalition Meetings**

The Carson River Coalition (CRC) is a bi-state, multi-county stakeholder group, hosted by the Carson Water Subconservancy District (CWSD) and funded by CWSD and the Nevada Division of Environmental Protection (NDEP). All counties within the watershed, as well as many other local, state and federal entities, private citizens and non-governmental agencies participate in the CRC and working groups. The meetings are open to the public and information about meetings is available at [www.cwsd.org](http://www.cwsd.org).

## Carson River Regional Floodplain Management - Annual CRS Report

At the February 9, 2012, Carson River Watershed Forum, Steve Lewis from the Cooperative Extension gave an update on the floodplain landowner workshops that the University of Nevada Cooperative Extension hosted in the Carson Valley, and Mitch Blum, HDR, Inc. provided an update on the floodplain mapping of the Carson River. Additionally, a survey was sent out post-forum to obtain feedback on the event. One specific question asked whether protecting floodplains from development should remain the CRC's main message and the overwhelming response was "yes"!

### 2.1.b River Corridor/Floodplain Management Working Group –The River

Corridor/Floodplain Management Working Group is a sub-committee of the CRC with a focus on regional floodplain management issues. Meeting dates during this reporting period include:

10/3/11	12/2/11	1/27/12	3/22/12
6/6/12			

For this reporting period, the group has mainly focused on completion of the suggested actions within the Regional Plan. The group continued review of the FEMA-funded Lyon, Carson City and Douglas Counties Floodplain Modeling and Mapping Project. This project is explained in detail under the Carson River Mapping and Modeling Project Management Team section below.

### 2.1.c Carson River Mapping and Modeling Project Management Team

This committee met during this reporting period on the following dates:

7/26/11	9/30/11
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The Carson River Mapping and Modeling Project Management Team (Team) serves as the steering committee for the implementation of the FEMA-funded Lyon County, Carson City and Douglas Counties Floodplain Mapping Project. This reporting period the Team met with the consultants HDR and R.O. Anderson Engineering to review the Hydraulic Modeling and Mapping Guidelines for the Carson River. The consultants gathered existing long-term stream gauge data along the Dayton Valley and Carson City reaches of the Carson River and did additional surveying and hydrologic analysis to create a more complete modeling/mapping program. The team also looked at the long-term USGS streamflow data of the East and West Forks of the Carson River. The flood mapping for FEMA Mapping Activity Statement (MAS) #1 and #2 will be completed in December 2012. The model outcomes will benefit the Carson River watershed by providing consistency and the ability to account for cumulative impacts. The results of the entire project will also provide an updated floodplain map of the Carson River from Dayton Valley through the Carson Valley. CWSD provided updates on the mapping project to Douglas County on January 5, Lyon County on January 19<sup>th</sup> and Carson City on February 2, 2012.

2.1.d Federal Emergency Management Agency (FEMA) Risk MAP Charter 2011/2012 (Charter)

The Charter, the first to be signed in FEMA Region IX, formalizes the collaborative efforts regarding flood management between Carson Water Subconservancy District (CWSD), FEMA Region IX (FEMA), U.S. Army Corps of Engineers (USACE), U.S. Geological Survey (USGS), U.S. Department of the Interior Bureau of Reclamation (USBR), State National Fund Insurance Program (NFIP) Coordinator, State Hazard Mitigation Office, and other partners. The Charter outlines the process to identify, assess, communicate, and plan for flood risk within the Carson River Watershed (watershed), which includes portions of Alpine County in California and Douglas, Carson City, Storey, Lyon, and Churchill Counties in Nevada. Storey County did not sign the Charter; however, they are participating in the meetings. The flood risk information provided will be used to enhance hazard mitigation plans, make informed decisions to improve resilience after flooding, protect the beneficial functions of floodplains, and raise awareness about local flood risks.

The Charter:

- Details the long-term flood hazard mapping vision for the watershed;
- Describes the desired mapping, assessment, planning information, and planning products;
- Describes the assistance that CWSD and FEMA will provide;
- Summarizes local flooding concerns and indicates areas where floodplain changes are expected; and
- Describes the roles and responsibilities of the CWSD, FEMA, and other signatory partners.

The first meeting of Charter signatories was held on March 21, 2012.

2.1.e Risk MAP Discovery

The Risk MAP Discovery process entails working closely with communities within the Carson River Watershed to better understand the local flood risk, mitigation efforts, etc., and to spur watershed-wide discussions about increasing the area's resilience after flooding. The Discovery process identifies areas at risk for flooding and solutions for reducing that risk on a watershed-wide basis. In relation to the above Charter, CWSD has hired R. O. Anderson to shepherd the Risk MAP Discovery process for CWSD and its partners. Meetings will be held with the Charter partners in the next reporting period to review the information gathered to date on flooding history, risks, stormwater and floodplain management activities, and any gaps in the data. This information will be used to update flood management and mitigation efforts on a watershed-wide basis.

**2.2 Low-Level Flooding/Stormwater Management**

2.2.a Carson Clear Water Revival (BMP) Program. This program began 1/09/09 as a pilot program in Carson City. The focus of the program is on landowners and how to

reduce sediment discharge and impacts from low level flooding on their properties. The program has been only partially successful at this time and more data will need to be gathered for the program to be expanded into all watershed counties. See BMP Education Program below.

During this reporting period the BMP Committee met on 8/1/11, 8/24/11, and 9/26/11, to discuss the following topics:

- The possibilities of expanding the program throughout the entire watershed;
- Selection of the 2011 contest winner and planning of BMP improvements;
- Successful project installation of second residence on October 26, 2011;
- Final Report to NDEP (Grantor) December 2011; and
- Outreach materials: signage and press releases.

#### 2.2.b Investigating Feasibility of Carson River Watershed Wide Small Residential BMP Program

CWSD has a small grant with NDEP to conduct a feasibility analysis for the watershed-wide expansion of the Small Residential BMP Program. During the course of the pilot program (2.2.a), two residential properties in Carson City's upper watershed won a contest and were provided cash and other project incentives to implement BMPs on their properties. Although these residences successfully implemented residential BMPs, the project's extensive outreach efforts, which included targeted residential workshops, newspaper articles, and even knocking on neighborhood doors to explain the project, did not produce many contest applications, nor an informed citizenry. An additional issue with the project was that the BMP's that were implemented were not low cost enough to be readily used by average homeowners. The project goals and objectives are as follows:

1. Determine an effective education and outreach method that can be modeled and adapted to the Carson River Watershed.
2. Determine a suite of low cost, effective, easily implemented BMPs that suit small scale residential lots.
3. Apply the knowledge gained through this project on a watershed-wide basis in the future when additional funding becomes available.
4. Provide the information gained to other entities or communities within Nevada that are trying to implement similar BMP programs.

During the reporting period CWSD has conducted on-line and telephone research of local, national, and international entities to find successful education/outreach models. We are continuing to conduct this research and analysis during the 2012/2013 reporting period.

### **3.0 Implementation of Suggested Actions**

The Regional Floodplain Management Plan divides implementation strategies into six categories and provides suggested actions for each category. The following sections

provide an overview of the work that was conducted for each category during this reporting period.

### **3.1 *Protect Floodplain Natural Functions and Values and Responsible Entities***

Suggested actions include:

- a. Adopt a Living River approach which will involve all entities.
- b. Floodplain and flood hazards should be considered with open space program objectives when selecting acquisition targets and establishing management strategies for open space, local governments and other entities.
- c. Plan for and mitigate cumulative effects of watershed urbanization.

Progress made during this period:

- Dayton Valley Conservation District and Lyon County continue to enhance floodplain value and function on the 300 acre “Rolling A Ranch” property just outside of Dayton. Weed management and streambank stabilization projects have continued throughout the Dayton Valley reach of the Carson River.
- CWSD summer interns assisted Lyon County with GPS data for some of their stormwater outlets along the Carson River.
- CWSD helped fund water quality improvements at the Riverview Park in Carson City.
- CRC River Corridor Working Group is exploring options to incentivize agricultural producers to keep the floodplain lands open. The group has begun research on the idea of providing an insurance incentive for agricultural owners who will fence off the river riparian area. The insurance would provide fence replacement in the event of a flood damaging or removing the fence.

### **3.2 *Higher Regulatory Standards***

Suggested actions include:

- a. Implement or enhance county ordinances that require 1:1 or greater mitigation ratio for floodplain storage volume. - local governments.
- b. Include the suggested ordinance language in county ordinances to provide watershed wide consistency. - local governments.

Progress during this period:

- The CRC River Corridor Working Group is researching what ordinances are currently in place per county that handle site clearance as a means to show progress to keep a permit from expiring. Site clearance can lead to water quality issues and erosion of the floodplain, especially during flooding events.

### **3.3 *Flood Data Information and Maintenance***

Suggested actions include:

## Carson River Regional Floodplain Management - Annual CRS Report

- a. Support FEMA'S Map Modernization Program and encourage FEMA to update FIRM'S with current and future conditions. - FEMA, CWSD and local governments.
- b. Develop and conduct unsteady state modeling to identify storage requirements - local and state governments, and CWSD. Potential funding thru NDEP, CWSD and other local and state entities.
- c. CWSD continue to participate in FEMA'S Cooperating Technical Partner Program. - CWSD and FEMA
- d. Flood studies should be conducted for the main channel and be used to update FEMA maps and fill data gaps. - CWSD and FEMA. Potential funding by Federal, state and local grant sources.
- e. Elevation Reference Marks (ERM) should be permanent monuments and updated on regular basis. -local governments
- f. ERMs should be in the same datum as base flood elevations on FIRMs or a datum that is readily convertible to FIRM datum. - local governments
- g. A master list of ERMs should be developed, maintained, and made available to interested parties. - local governments and CWSD
- h. Photo-Monitoring program should be developed to document flooding and flood hazards in consistent matter. - CWSD, CRC, and local governments

### Progress during this period:

- FEMA has provided \$300k in funding to the CWSD for the Lyon County and \$300K in funding for the Carson City modeling and mapping projects (see Section 2.1.c above).
- The FEMA funded Lyon County and Carson City project will correct inaccuracies in the maps for that portion of the river system. The Lyon County and Carson City maps will be submitted to FEMA to update the FIRM in the next reporting period.
- The River Corridor Working Group has been researching a master list of ERMs, and a draft map has been created. This draft map will be reviewed and updated in the next reporting period.
- CWSD summer interns began to collect baseline photographs for photo monitoring purposes. Additionally, the River Corridor Working Group has been researching the possibility of creating a mobile phone application where the public can take photos and upload them during flood events.
- CWSD has leverage money that can be used for flood studies.

### **3.4 Channel Migration and Bank Erosion Monitoring**

#### Suggested actions include:

- a. Known and projected hazard areas, including channel migration hazards, should continue to be documented, and updated information should be incorporated in the planning processes.

- b. LiDAR and/or aerial photography (on a watershed level) should be conducted on a 5-year basis to provide updated information on channel movement and floodplain condition.
- c. Establish building set-backs or buffers in flood hazard areas, where appropriate, to reduce severe hazards from channel migration.
- d. Channel cross-sectional surveys should be conducted and well documented to track long term changes in river channel.
- e. Identify unstable areas and areas with high potential for erosion, including areas prone to channel meandering and avulsion.
- f. Promote the use of bio-engineering techniques in river restoration projects in combination with other proven methods.

Progress during this period:

- CWSD obtained a grant for \$84,000 through NDEP to conduct a LiDAR study of the Carson Valley. CWSD is matching this with \$28,000 for a total cost of \$112,000.

### **3.5 Floodplain and Flood Hazard Outreach and Education**

Suggested actions for this category include:

- a. Develop a watershed-wide outreach and education program about floodplain importance and flooding hazards.
- b. Brochures should be developed for distribution on a watershed level with consistent messages and information for the general public.
- c. CWSD website will provide information on the Regional Floodplain Management Plan and provide emergency contact information. Local governments and other entities can link to this website to increase distribution.
- d. Annual Flood Awareness Week will be established with the objective of providing information about flooding and flood hazards to the general public.
- e. Special events, River Work Days, and other outreach opportunities should be utilized to help raise awareness of flooding hazards and importance of floodplains.

Progress during this period:

- Two additional floodplain management brochures were developed by the University of Nevada Cooperative Extension with funding through the Carson Clearwater Revival project discussed in Section 2.2.a above. *“Don’t Put Your Home and Family at Risk from Floods!”* and *“Agriculture is a Good Fit in the Floodplains”* are being distributed at community and other outreach events. These brochures are available for distribution by any entity within the Carson River Watershed.
- CWSD developed a flooding/floodplain protection display that was placed at Carson City library in December 2011.
- Watershed website provides link to plan at [www.cwsd.org](http://www.cwsd.org).

## Carson River Regional Floodplain Management - Annual CRS Report

- Numerous articles about floodplain protection and flooding were included in the watershed newsletter that is distributed to over 600 individuals throughout the six county area.
- Several Carson River Work Days were held and included a station about flooding and the importance of floodplain protection.

### **3.6 Reduction of Infrastructure Impacts**

There are opportunities throughout the watershed for the enhancement and/or design and maintenance of roads, culverts, grade controls, and bridges to accommodate floodwaters better, protect floodplains, and decrease harmful erosion.

Progress made during this period:

- CWSD has not been involved with any reduction of infrastructure impacts projects during this reporting period.