

**CRS ANNUAL REPORT
(Period of July 1, 2013 to June 30, 2014)**

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. The 2008 plan was formally adopted by Douglas, Carson City, Lyon, and Churchill Counties in Nevada, and Alpine County in California. A Supplemental Update of the plan was subsequently adopted by these five counties in 2013. Although a small portion of Storey County is within the Carson River Watershed, they have not formally adopted the Regional Floodplain Management Plan or the Supplemental Update. However, CWSD has presented the original 2008 plan and the 2013 update to the Storey County Board of Commissioners as an information item.

This report provides progress on the suggested actions associated with the regional plan for Carson City, Douglas and Storey County to assist with reporting to FEMA on actions associated with the National Flood Insurance Community Rating System (CRS) program.

The purpose of the regional plan is to create long-term vision and strategies for floodplain management to reduce flood damage impacts while protecting the resources associated with the Carson River Watershed. 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

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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.

A CRC Forum was held on April 3, 2014. Two presentations focused on floodplain protection:

- **Floodplain Protection Messaging and Mapping:** John Cobourn and Steve Lewis, *University of Nevada Cooperative Extension*
- **Carson River FEMA Physical Map Revision:** Mitch Blum, *HDR*

and a third focused minimizing the impacts from stormwater run-off:

- **Low Impact Development:** Jeremy Drew and Kristin Roaldson, *Resource Concepts, Inc.*

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:

7/17/2013 9/11/2013 12/3/2013 2/11/2014

For this reporting period, the group has mainly focused on completion of several of the suggested actions within the Regional Plan and the finalization of the Regional Floodplain Management Supplemental Update 2013. The group continued review of the FEMA-funded Lyon, Carson City and Douglas Counties Floodplain Modeling and Mapping Project. See Section 3.3 for additional discussion.

2.1.c Federal Emergency Management Agency (FEMA) Risk MAP Program

In 2011, CWSD and various federal, state, and county government bodies signed the first FEMA Region IX Risk MAP Charter formalizing collaborative efforts for flood management in the Carson River Watershed. Storey County did not sign the Charter; however, they are participating in the meetings. This collaboration enhances hazard mitigation plans, improves community resiliency after flooding, protects beneficial functions of floodplains, and raises awareness about local flood risks.

2.1.c.1 Risk MAP Discovery

The Risk MAP Discovery process works 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 resiliency after flooding. The Discovery process identified areas at risk for flooding and solutions for

reducing that risk on a watershed-wide basis. The 2012 Discovery Report identified priority projects per County. The Charter signatories met on November 20, 2013 and April 29, 2014 to discuss FEMA funding, review priority projects, and floodplain management suggested actions. Agenda's and meeting notes are available at CWSD.

2.2 Low-Level Flooding/Stormwater Management

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

CWSD had 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 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 for 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.

A final report on this project was completed in September 2013 and is available from CWSD. CWSD is interested in pursuing the recommendations associated with the final report in conjunction with water conservation efforts and our low impact development project (See Section 2.2.c) when additional funding becomes available.

2.2.b Combined Municipal Separate Storm Sewer System (MS4) Plan for Indian Hills General Improvement District (GID) area, portions of Douglas County in the Clear Creek and Johnson Lane areas, Carson City, and NDOT in the Clear Creek Watershed

CWSD is funding a 2013 request from Indian Hills GID to pursue the development of a regional MS4 to comply with the revised EPA General Permit as managed by NDEP. The regional MS4 will include portions of Douglas County, Lyon County, and Indian Hills General Improvement District, as well as, all of Carson City. RCI has been hired to complete this project. The regional MS4 is expected to be completed by the end of fiscal year 2014/2015.

2.2.c Promote Low Impact Development (LID) Use in the Carson River Watershed

There are several urbanized areas within the Carson River Watershed where the use of LID practices will provide benefits to the water quality of the Carson River. CWSD recently received 208 Clean Water Act planning funding through NDEP and will be using this grant to look at promoting the use of Low Impact Development (LID)/green infrastructure throughout the urbanized areas in the watershed. LID is an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product. There are many practices that are used that adhere to these principles such as bio-retention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. By implementing LID principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. Applied on a broad scale, LID can maintain or restore a watershed's hydrologic and ecological functions. CWSD has hired RCI to assist with our planning efforts and identify what is currently being implemented, any implementation barriers, the best types of practices applicable to our area, and how to better promote these types of practices throughout our watershed to improve water quality and stormwater management. This project is underway and expected to be complete in late 2014.

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 helps fund the Alpine Watershed Group (AWG) to continue their work in the Upper Carson River Watershed. The Hope Valley Floodplain

Restoration project made significant design phase progress during this reporting period. Alpine County finalized the purchase of the Markleeville Creek Floodplain Restoration Project site on 12/23/13. The project is at 95% design and is expected to cost around 1.2 million. Funding is being pursued from various sources including California's Department of Water Resources Integrated Regional Water Management (IRWM) grant program, Supplemental Environmental Project funding through the Lahontan Regional Water Quality Control Board, Wildlife Conservation Board, and the Sierra Nevada Conservancy. The project is expected to be completed by January 2015 depending on funding availability.

- CWSD has obtained funding for the FEMA Mapping Activity Statement Projects (MAS) 1, 2, 3, and 4. This flood modeling and mapping project will ultimately assist in the planning and mitigation of the cumulative impacts of urban development in our riverine flood zones. The Lyon and Carson City portions of the project have been completed and are currently being reviewed by FEMA. The Carson Valley portion (MAS 3 & 4) are in progress with an expected completion date of 2015. CWSD has submitted a grant for additional FEMA funding (MAS 5) for \$325,000 - \$375,000 for several flood projects in the watershed including Smelter and Alpine View drainage projects in Douglas County, and Eagle Valley Golf Course drainage A & B in Carson City. MAS 5 also requested funding for flood inundation mapping for the Carson River in conjunction with National Oceanic and Atmospheric Administration (NOAA). CWSD hopes to hear whether we received the funding by fall of 2014.
- See Higher Regulatory Standards Section 3.2 below for additional measures associated with cumulative effects.

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.
- With assistance from the FEMA MAS 4 funding, CWSD will hire a planning consultant to review adequacy of current county flood ordinances to ensure consistency in application and mitigation measures associated with the new flood hazard maps from MAS 1-4. These new maps will help address cumulative impacts on a watershed scale and the review will also include determining an effective and consistent process for assessing cumulative impacts and updating the model with each completed development.

3.3 Flood Data Information and Maintenance

Suggested actions include:

- 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 over \$600,000 in funding to the CWSD for the Douglas County portion of the FEMA MAS Project (MAS 3 & 4). MAS 3 funding covers the surveying of structures and the modeling of the Carson Valley between the Carson City boundary to just beyond the Alpine County, CA boundary. MAS 4 funds are being used to map this area. HDR has been hired by CWSD to complete the modelling, mapping, and model updating protocols associated with MAS 1-4.
- The FEMA funded Lyon County and Carson City MAS 1 and 2 projects maps are finalized and are submitted to FEMA to update the FIRM. CWSD is awaiting the finalization of these phases.
- CWSD has applied for additional FEMA funding (MAS 5) \$325,000 - 375,000 through the Map Modernization program and as a Cooperating Technical Partner.

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:

- Bio-engineering techniques were used by the Carson Valley Conservation District and The Nature Conservancy at River Fork Ranch along Brockliss Slough. CWSD assisted with funding for this project.

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:

- CWSD and several CRC stakeholders presented a symposium to the Soil and Water Conservation Society's Annual International Conference in July 2013 and the Nevada Water Resources Association's Terminal River's conference in November 2013. The presentation entitled "A Living River Approach to Floodplain Management in the Carson River Watershed" was received well on both occasions.
- CWSD staff is working with the NV Flood Awareness Week planning committee on a bi-monthly basis. NV Flood Awareness Week will be Nov. 10-15, 2014 and will include state and county proclamations, specific events, bill board advertisements and PSAs. Each County is encouraged to participate by having local events, etc. A website has been created, housed by Nevada Division of Water Resources (NDWA) at NevadaFloods.org.

Funding is available for this year, 2014, through NV Division of Water Resources, and various other agencies. CWSD staff is supported through the FEMA MAS 4 grant. CWSD is seeking additional funding from FEMA MAS 5 to assist with a similar event in subsequent years.

- Watershed website provides link to the Floodplain Management Plan at www.cwsd.org.
- Numerous articles about floodplain protection and flooding were included in CWSD's newsletter, "The Flow" that is distributed to over 600 individuals throughout the six county watershed.
- Several Conserve Carson River Work Days were held and included a station about flooding and the importance of floodplain protection.
- University of Nevada Cooperative Extension is currently working with the CRC to create a Floodplain Protection Messaging and Mapping brochure. This brochure will discuss the importance of protecting the floodplain from development, and provide baseline map identifying where and how much of the Carson River Watershed's floodplain is currently protected. CWSD is assisting with printing this brochure once peer review and final editing is completed.

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 funded projects associated with this suggested action during this reporting period.