

CRS ANNUAL REPORT
(Period of July 1, 2015 to June 30, 2016)

On Activities Associated with the

Carson River Watershed
REGIONAL FLOODPLAIN MANAGEMENT PLAN

Submitted for:

DOUGLAS COUNTY
and
CARSON CITY
and
STOREY COUNTY

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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 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 Main Meeting was held on October 21, 2015. [Meeting notes](#) are available on our website.

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. This group met three times (7/22/2015, 11/17/2015, and 6/1/2015) during the last year to discuss river and flood projects and plans for FEMA funding. [Agendas and Meeting notes](#) are available on our website.

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 resilience 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. A RiskMap Charter meetings was held January 27, 2016 to discuss which projects CWSD should pursue for FEMA Mapping Activity Statement 7 funding. The agenda and meeting notes are available at CWSD.

2.2 Low-Level Flooding/Stormwater Management

2.2.a 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

The area subject to the General Permit for “Small MS4s”, and initially identified as the Carson City Urban Area by the EPA, is multi-jurisdictional including non-contiguous parts of Carson City, Indian Hills, and Douglas County (Johnson Lane and Clear Creek). Douglas County has been told that in the near future, the general permit area will be expanding to include additional areas within the County including Minden/Gardnerville/Gardnerville Ranchos. There are also additional areas within Lyon County (Dayton area) that will likely be included in the Small MS4 permit. Additional area inclusion is based on population growth from the 2010 census. As such, the development of a Carson River Regional Stormwater Management Plan has been underway to coordinate education/outreach messages, expand public participation, and encourage consistent approaches to Best Management Practices along the Carson River corridor.

The development of this regional plan was originally funded by CWSD in 2013. Resource Concepts, Inc. was hired and began the process. Additional funding was obtained in 2014 through NDEP’s Stormwater Circuit Rider program for RCI to finalize the plan. The working group has held a series of meetings to identify the goals of the regional plan and address each of the “Minimum Control Measures” (MCM) required in the general stormwater permit. Needs, opportunities, and constraints of the different jurisdictions were discussed for each MCM and presented to the group. A document identifying joint rationale statements and BMP approaches is in draft form.

During development of the draft regional plan, several issues arose with consistency between jurisdictions for processes, procedures and ordinances. Due to this circumstance, the plan has been on hold. Carson City has been given direction from NDEP to update their existing plan, and Lyon and Douglas Counties have been told a new permit will be forthcoming. RCI is investigating whether there is still interest in pursuing the regional plan, or utilizing the current draft as a reference guide for developing individual county specific plans. Although this plan is currently on hold, CWSD believes completing the plan is important and plans to revive this effort to find solutions to the consistency issues discussed above.

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

CWSD approved the Low Impact Development in the Carson River Watershed report in April 2015. CWSD received 208 Clean Water Act planning funding through NDEP and hired RCI to complete the document. The report outlines how LID can assist in managing stormwater, discusses the benefits of LID and which LID practices are useful in our area, and makes recommendations on how to implement LID. The report is available on www.cwsd.org. CWSD staff presented the LID Report to County Staff. CWSD also presented the report to each County Planning Commission, with the exception of Douglas County (based on staff advice regarding other priority issues/timing). CWSD hopes to address Douglas County’s Planning Commission in the future regarding this matter.

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. - *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 – local governments.
- d. Retain lands that provide floodplain storage and maintain or restore connection of river with floodplain through land acquisition, conservation easements, local open space, etc.... - *local and tribal governments, NGO's, landowners.*
- e. Encourage the incorporation of low impact development principles into subdivision proposals for floodplain lands... - *local governments.*

Progress made during this period:

- Weed management and streambank stabilization projects have continued throughout the Dayton Valley reach of the Carson River. Other projects include: Ramsey Canyon Drainage/Floodplain Restudy and Remapping; Monitoring /Previous River /Bank Stabilization Project Audit (to assess previous projects effectiveness); as well as planning for additional projects located on both private property and on lands owned by various public entities near Ft. Churchill State Park.
- CWSD helps fund the Alpine Watershed Group (AWG) to continue their work in the Upper Carson River Watershed. Phase I of the Hope Valley Floodplain Restoration project is completed and Phase II has begun. 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 continues to be 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. AWG and the USFS, USBLM, and Alpine County partnered to restore/improve/enhance shoreline areas and limit off highway vehicle areas along the East Fork of the Carson River between Centerville Flats and Hangman's Bridge. The project focused on providing recreation access while restoring riparian vegetation and limiting future damage.

- CWSD has completed FEMA Mapping Activity Statement Projects (MAS) 1, 2, 3, and is finalizing MAS 4. This multi-year funded flood modeling and mapping project assisted 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. FEMA has completed review of Lyon County maps. The updated Carson City flood hazard maps are currently being reviewed by FEMA. The Carson Valley portion (MAS 3 & 4) will be completed in December 2016. Through MAS 4, CWSD hired a floodplain management contractor to review and assess mitigation measures (both developer and County measures) to be rolled into new floodplain ordinances once the FEMA maps are adopted. See Higher Regulatory Standards Section 3.2 below.
- CWSD completed FEMA MAS 5 which included several flood projects in the watershed including Smelter and Alpine View drainage projects in Douglas County, Eagle Valley Golf Course Drainage A & B in Carson City, and the Sheckler Shunt feasibility study in Churchill County. MAS 5 also included funding for flood inundation mapping for the Carson River in conjunction with National Oceanic and Atmospheric Administration (NOAA). These maps are being reviewed by NOAA and should be available by December 2016.
- CWSD funded and Douglas County administered a hydraulic and geomorphic analysis study conducted by Balance Hydrologic, on the East Fork of the Carson River at Virginia Rocky Diversion in Douglas County. The study was completed in spring 2015, and provided several recommendations to resolve severe erosion along the bank that if breached during a flood event, could cause damage to existing developed areas, as well as the Virginia Rocky Diversion structure. The report is available at Douglas County.
- CWSD has submitted a funding request to FEMA (MAS 6) for \$327, 000 to complete the following list of project components:
 - Douglas County Stephanie Lane Drainage Identification and Mitigation Project
 - Public Outreach Flood Awareness Program (PSA's to 4 audiences)
 - Carson City Inundation Maps
 - Carson City Goni Wash Restudy and Remapping Project
 - Lyon County Ramsey Canyon Restudy and Remapping Project
- In June 2016, CWSD submitted a funding request to FEMA (MAS 7). The list of project components in this grant proposal are:
 - Douglas County Johnson Lane Area Drainage Master Plan
 - Updates to the 2012 Discovery Report and Regional Floodplain Management Plan
 - Carson City Voltaire Canyon Restudy and Remapping Project

- Northern Nevada Public Outreach Flood Awareness Program

CWSD hopes to be informed regarding our funding request in fall 2016. The full FEMA grant proposal is available at CWSD.

- Floodplain Protection Inventory for the Carson River was finalized by John Cobourn and Steve Lewis, UNCE. This Special Publication 15-05 focuses on riverine floodplain protection and provides a baseline amount of protected lands from which to measure our progress toward additional floodplain land protection. CWSD and CRC members assisted in gathering data and final review of the publication. CWSD funded the printing of the publication.
- See Section 2.2.b regarding Low Impact Development (LID) progress.

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:

- With assistance from the FEMA MAS 4 funding, CWSD issued an RFP in July 2015 to 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. The new maps will help address cumulative impacts on a watershed scale. The review will also include determining an effective and consistent process for assessing cumulative impacts and updating the model with each completed development. Stillwater Consulting was hired and started the process of determining consistent mitigation measures for each County to use, as well as, what could be used by developers in the floodplain and/or floodway. The model update protocol is currently being created by HDR, Inc. and both of these measures will be included in the model ordinance creation scheduled to begin Fall 2016. CWSD is working collaboratively with County planners and floodplain managers on these projects.

3.3 Flood Data Information and Maintenance

Suggested actions and responsible parties:

- 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:

- a. The development of a new floodplain model for Carson Valley was completed (MAS 3). FEMA MAS 5 is in progress. See Section 3.1 above for details.
- b. The restudy and remapping of the floodplains for Alpine View Estates drainage and Eagle Valley Golf Course Drainage A & B were completed and are waiting on FEMA review.

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 continue to be used by the Carson Valley Conservation District and The Nature Conservancy at River Fork Ranch along Brockliss Slough and the East Fork. CWSD assisted with funding for some of these projects.
- Dayton Valley Conservation District is in the process of completing a monitoring study of all the bank stabilization projects completed. This project is jointly funded by NDEP Clean Water Act 319 funds and CWSD. The project will help determine what projects are still in place and what will need repair. A final report is expected to be available from NDEP in Dec 2016.
- The Friends of Hope Valley in partnership with the Alpine Watershed Group continue to plant willow stakes and complete bio-engineering bank stabilization projects in Hope Valley. AWG's Markleeville Creek Day has expanded to include bioengineering projects along the East and West Forks. CWSD supports AWG with funding.
- The Alpine Watershed Group (AWG), in partnership with Humboldt-Toiyabe National Forest (USFS), Bureau of Land Management (BLM), Friends of Hope Valley and Alpine County, was awarded a restoration grant from California State Parks' Off Highway Motor Vehicle Recreation (OHMVR) program. Phases I and II of the OHMVR grant project restored riparian habitat along the banks of the East Fork of the Carson River currently impacted by off-road vehicle travel associated with dispersed camping. All restored sites are located on USFS and BLM lands within Alpine County. The project area includes the reach of the East Fork from its confluence with Silver Creek to Hangman's Bridge just east of Markleeville. This reach of river has experienced riparian habitat loss, bank erosion and associated water quality impacts, in part due to motor vehicle impacts. These rehabilitation efforts protect the riparian corridor by better defining vehicle access locations and restoring and replanting impacted areas. Recreational and environmental benefits of the project include maintaining access to public lands, improving the sustainability of dispersed camping, as well as the sustainability of other recreational uses (such as fishing) along this reach of the East Fork. The rehabilitation of riparian habitat will reduce silt and other water quality impacts to this economically important trout fishing reach. This project has and continues to greatly improved visitors' recreational experience at these sites and enhances this California designated Wild and Scenic River. Implementation began in the fall 2015, the third phase (an ~450 feet bank stabilization project) will be finalized prior to the expiration of the grant in June 2017.
- CWSD funds Lahontan and Stillwater Conservation Districts in Churchill County to undertake clearing and snagging projects to alleviate potential flood choke hazard points.
- CWSD and its partners successfully lobbied the NV Legislature to reinstate the State Clearing and Snagging Fund. These funds combined with CWSD

funds, are being used by local conservation districts to undertake clearing and snagging projects throughout the watershed.

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:

- With funding from MAS 5, staff worked with the flood awareness committee bi-monthly to plan and implement Flood Awareness Week (FAW) held Nov. 1-7. With FEMA funding, CWSD organized the placement of FAW billboards in several locations throughout the watershed. A website was created in 2014 and is updated with new relevant information regularly. The website is hosted by Nevada Division of Water Resources (NDWA) at NevadaFloods.org.
- CWSD staff worked with all of our partners to CWSD staff is working with the NV Flood Awareness Week planning committee on a monthly basis. NV Flood Awareness Week this year is scheduled for Nov. 14-19th, 2016 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. Funding is available for this year, 2016, through NV Division of Water Resources, and various other agencies. CWSD staff is supported through the FEMA MAS 5 grant. The FEMA grant will support additional billboard placement in the Carson River Watershed for 2016. CWSD continues to seek additional funding through FEMA MAS grants to assist with a flood awareness week for subsequent years.
- CWSD has FEMA MAS 5 funding to complete 4 PSA's looking at "Floodplains as Community Assets".
- Watershed website provides link to the Floodplain Management Plan and emergency manager information at www.cwsd.org.
- Floodplain protection and flooding articles were included in CWSD's newsletter, "The Flow" that is distributed to over 1000 individuals throughout the six counties located in the Carson River watershed.

- Several community events were attended by staff where the floodplain model was run and the importance of floodplain protection discussed.
- See Section 3.1 regarding details on UNCE's Floodplain Protection Inventory of the Carson River Watershed publication.

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:

- See Section 3.1 relating to the study on the Virginia Rocky Diversion.

4.0 Conclusion

CWSD is working diligently to coordinate the completion of the 38 suggested actions in the Floodplain Management Plan adopted by the five counties along the Carson River. Please contact Ed James 775.887.7450 or Brenda Hunt 775.887.9005 with any questions or comments regarding the above report.