las vegas wash coordination committee

2013 year-end report
### CAMP action items

**EROSION & STORMWATER**, administered by the Operations Study Team

1. Install erosion control structures
2. Obtain topography and geophysical data
3. Conduct sediment transport modeling
4. Establish off-stream wetlands with alternate discharge considerations
5. Evaluate stormwater detention/retention basins

**ALTERNATE DISCHARGE**, administered by the Las Vegas Valley Watershed Advisory Committee

6. Implement the dischargers scope of services, alternative discharge study
7. Incorporate options and selection criteria developed by the Alternate Discharge Study Team
8. Utilize the Alternate Discharge Study Team throughout the process
9. Integrate work done by other study teams into process
10. Update public officials and interested parties throughout the process

**LAND USE**, administered by individual member agencies

11. Focus land use recommendations on a priority zone of influence (1/2 mile radius of Las Vegas Wash)
12. Support the development and implementation of a common environmental review process among planning entities
13. Develop best management practices
14. Develop educational materials for developers
15. Identify opportunities for interagency coordination efforts

**JURISDICTIONAL & REGULATORY**, administered by the Las Vegas Valley Watershed Advisory Committee and the Las Vegas Wash Coordination Committee

16. Further investigate and define structure for local oversight of the Las Vegas Wash Comprehensive Adaptive Management Plan
17. Ensure interagency coordination

**PUBLIC OUTREACH**, administered by the Administrative Study Team

18. Establish a method to continue implementation of the public outreach program
19. Continue implementation of feedback mechanisms and measurements of progress and results
20. Provide updates to elected officials

**FUNDING**, administered by the Administrative Study Team

21. Further investigate potential funding sources identified by the team
22. Anticipate future funding needs
23. Work with the Las Vegas Wash management entity to review funding options
24. Develop method to identify specific projects for grant funding
25. Utilize existing resources and staff, whenever possible

**SHALLOW GROUNDWATER**, administered by the Research and Environmental Monitoring Study Team

26. Develop a central database
27. Locate and inventory existing shallow monitoring wells
28. Identify issues of concern
29. Develop a long-term monitoring program
30. Develop a method to identify the potential for future contaminant discovery
31. Develop and implement a notification plan
32. Promote interagency coordination
33. Develop a bibliography

**WETLANDS PARK**, administered by Clark County

34. Identify water resources needed to maintain the park
35. Develop long-term monitoring plans
36. Develop a long-term operations & maintenance plan
37. Ensure implementation of mitigation measures
38. Identify funding needs
39. Ensure interagency coordination

**ENVIRONMENTAL RESOURCES**, administered by the Research and Environmental Monitoring Study Team

40. Develop long-term management and monitoring plans
41. Conduct additional research
42. Preserve and address cultural resource issues
43. Identify funding needs
44. Facilitate interagency coordination to ensure projects are implemented

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**On the cover,**
Frenchman Mountain at Upper Diversion Weir

Report photography provided by Rodd Bailey (yellow-billed cuckoo) and members of the Las Vegas Wash Project Coordination Team.
The recently completed Clark County Wetlands Park Nature Center

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Dear Friends:

As we mark the 15-year milestone for the Las Vegas Wash Coordination Committee, it is important to reflect on our successes to-date and remember our initial goals. From the many award-winning engineering projects to the extensive wildlife research conducted, the activities taking place at the Las Vegas Wash continue to help stabilize its banks, provide a safe habitat to numerous plants and wildlife, and most importantly, protect the quality of our community’s water resources.

This Year-End Report summarizes the many activities conducted by the Las Vegas Wash Coordination Committee throughout 2013. The report describes accomplishments from each area of the project and lays out objectives for the next year. The activities described within have had a direct impact on the success seen along the channel.

The transformation of the Las Vegas Wash over the past 15 years is a true testament to the efforts of our dedicated partners. Although we’ve seen substantial progress, we must continue to work together to achieve our mission to stabilize and enhance the Las Vegas Wash. The Las Vegas Wash Coordination Committee will continue to coordinate and implement action items guided by the “Las Vegas Wash Comprehensive Adaptive Management Plan,” but we can only achieve our goals with the critical assistance of each of our stakeholders and an informed and involved community.

Sincerely,

Thomas A. Minwegen
Chairperson, Las Vegas Valley Watershed Advisory Committee
Las Vegas Wash Coordination Committee
background

The Las Vegas Wash (Wash) is a tributary that carries approximately 200 million gallons of urban runoff, shallow groundwater and highly treated wastewater from across the Las Vegas Valley to Lake Mead each day. The channel also conveys flows from periodic storm events. As the final link in the valley’s water supply, the Wash’s wetlands help polish impurities from the water as it makes its way to the lake.

Rising population and development rates in the valley in the latter half of the twentieth century triggered an exponential increase in water flows. The increased daily flows, coupled with flows from large storm events, caused significant erosion of the channel’s bed and banks and threatened wildlife habitat, water quality and wastewater infrastructure. In order to address these environmental and water resource challenges, the long-term management of the Wash became a top priority.

In 1998, the Las Vegas Wash Coordination Committee (LVWCC) was formed. The committee’s first milestone was the completion of the “Las Vegas Wash Comprehensive Adaptive Management Plan” (CAMP)—a roadmap that includes 44 action items related to water quality, environmental resources, erosion control and other key Wash-related issues. The LVWCC also created internal sub-committees and an oversight committee, the Las Vegas Valley Watershed Advisory Committee (LVVWAC).

The LVWCC and its member agencies have taken significant strides toward enhancing the Wash. Today, water quality is improved, and the channel supports a thriving habitat filled with hundreds of species of plants and wildlife, creating a beautiful natural space for outdoor enthusiasts and other visitors to enjoy. This report is provided by the LVVWAC and offers an overview of the progress of the CAMP action items, the LVWCC’s accomplishments of the past year and objectives for 2014.

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1 - Fiscal year July 2013–June 2014
2 - Calendar year January-December
summary and evaluation of CAMP action items

The LVWCC uses an adaptive process to meet its mission. As part of that process, the action items of the CAMP document are evaluated in this section.

**Erosion and Stormwater**, administered by the Operations Study Team

1. **Install erosion control structures**
   
   Seventeen of the 22 planned erosion control structures (i.e., weirs) have been installed along an approximately 6-mile section of the Wash (16 are permanent structures, and one, the Demonstration Weir, is temporary and will be replaced by the Three Kids Weir).

2. **Obtain topography and geophysical data**
   
   Semi-permanent ground control points were established and topography and geophysical data are collected as needed to facilitate weir design and construction.

3. **Conduct sediment transport modeling**
   
   Sediment transport models have been developed using standard computer programs. Model runs are conducted as needed to understand system function and to inform weir design.

4. **Establish off-stream wetlands with alternate discharge considerations**
   
   An off-stream wetland feasibility study was prepared and concluded that wetlands should be established within the active flood plain and not in surrounding upland areas.

5. **Evaluate stormwater detention/retention basins**
   
   Clark County Regional Flood Control District (CCRFCD, ccrfcd.org) regularly updates a flood control master plan, which includes an evaluation of stormwater detention/retention basins throughout the valley. Facilities built in the Wash and elsewhere in the valley consider regional stormwater plans.

**Alternate Discharge**, administered by the LVVWAC, action items 6 – 10

The Systems Conveyance and Operations Program was deemed unnecessary for the foreseeable future.

**Land Use**, administered by individual member agencies, actions items 11 – 15

**Jurisdictional and Regulatory**, administered by the LVVWAC and LVWCC

16. **Further investigate and define structure for local oversight of the Las Vegas Wash Comprehensive Adaptive Management Plan**
   
   Formerly the Management Advisory Committee, local oversight was officially changed to the LVVWAC by an interlocal agreement in 2007 (then amended in 2012). The eight members act on behalf of their governing boards and councils. Southern Nevada Water Authority (SNWA, snwa.com) was appointed the lead agency for implementing CAMP action items.

17. **Ensure interagency coordination**
   
   Regular meetings are convened by managerial, technical and administrative staff to ensure that interagency coordination is achieved. The Las Vegas Wash Project Coordination Team (Wash Team) hosted 16 such meetings in 2013.

**Public Outreach**, administered by the Administrative Study Team

18. **Establish a method to continue implementation of the public outreach program**
   
   Annual funding allocations are provided so that the public outreach program continues to be implemented.

19. **Continue implementation of feedback mechanisms and measurements of progress and results**
   
   Solicited and unsolicited feedback is obtained at various public outreach events and on lvwash.org. Progress measurements (e.g., website visitors, event attendees, number of events, etc.) are recorded and reported quarterly to the LVWCC and in annual reports. The “Las Vegas Wash Outreach Plan, 2013,” further codified effectiveness monitoring for the outreach program. As an additional measure, the plan recommends conducting systematic surveys of various outreach participants.

20. **Provide updates to elected officials**
   
   Member agencies use the Wash newsletter (formerly the Email Update), Year-End Reports and other information provided by the Wash Team to keep elected officials informed.
Funding, administered by the Administrative Study Team

21. Further investigate potential funding sources identified by the team
   Funding sources were identified and include local, state, federal and private contributions. Local contributions come from a portion of a quarter-cent sales tax and direct payments. State, federal and private contributions come from grants.

22. Anticipate future funding needs
   Annual budgets detail funding needs for anticipated operating and capital expenditures.

23. Work with the Las Vegas Wash management entity to review funding options
   Budgets are reviewed and approved annually by the LVWWAC. Operating expenditures not reimbursed by state, federal or private grants are paid for by the City of Henderson (4.8%), City of Las Vegas (9.9%), City of North Las Vegas (3.9%), Clark County (10%), CCRFCD (10%), Clark County Water Reclamation District (21.4%) and SNWA (40%). Capital expenditures not paid for by grants are paid for by a portion of the quarter-cent sales tax and account loans.

24. Develop method to identify specific projects for grant funding
   Projects that could be funded by grants are vetted by the study teams and Wash Team. Assessment and prioritization criteria include, but are not limited to, feasibility, cost, need for and importance of information and program benefit.

25. Utilize existing resources and staff, whenever possible
   Regular meetings among the LWCC stakeholders provide a forum for ensuring that existing resources and staff are used to prevent duplication. Partnerships have led to improved efficiencies in wetland, water quality and bioassessment monitoring programs.

Shallow Groundwater, administered by the Research and Environmental Monitoring (REM) Study Team

26. Develop a central database
   A central database has been developed. Data are added when made available.

27. Locate and inventory existing shallow monitoring wells
   Existing data and geospatial technologies were used to locate and inventory shallow monitoring wells in the valley.

28. Identify issues of concern
   Ongoing water quality monitoring programs and stakeholder data sharing forums provide for the early detection of issues of concern.

29. Develop a long-term monitoring plan
   A long-term shallow groundwater monitoring plan has been drafted and is under review.

30. Develop a method to identify the potential for future contaminant discovery
   Regular data assessments are completed to evaluate potential concerns and analyte lists are regularly revised.

31. Develop and implement a notification plan
   Managed by outside agencies.

32. Promote interagency coordination
   Regular meetings are convened by managerial, technical and administrative staff to ensure that interagency coordination is achieved. The Wash Team organized three meetings of the REM Study Team in 2013.

33. Develop a bibliography
   A bibliography was completed and is accessible on the members’ section of lvwash.org.

Wetlands Park, administered by Clark County, action items 34 – 39

Environmental Resources, administered by the REM Study Team

40. Develop long-term management and monitoring plans
   Long-term management and monitoring plans have been completed and updates and other activities are ongoing to achieve plan goals.

41. Conduct additional research
   Research activities are ongoing and are vetted by the study teams and the Wash Team.

42. Preserve and address cultural resource issues
   SNWA works with state, federal and tribal stakeholders to preserve cultural resources where feasible and mitigate when infeasible. A Programmatic Agreement was signed and executed by all parties in 2011. The Cultural Resources Coordinating Committee was established as a result and the “Cultural Resources Management Plan for the Las Vegas Wash Archaeological District in Clark County Wetlands Park, Las Vegas, Nevada” to guide future activities.

43. Identify funding needs
   Funding needs are vetted by the study teams and Wash Team. Assessment and prioritization criteria include, but are not limited to, feasibility, cost, need for and importance of information and program benefit.

44. Facilitate interagency coordination to ensure projects are implemented
   Regular meetings are convened by managerial, technical and administrative staff to ensure that interagency coordination is achieved. The Wash Team organized three meetings of the REM Study Team in 2013.
Las Vegas Wash 2013 Activities Maps

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Note: maps illustrate activities completed during 2013

Bioassessment Monitoring, Water Quality & Wetland Demonstration Projects

- Macroinvertebrate Selenium Study Sites
- Real-time Monitoring Sites
- Benthic Macroinvertebrate Sampling Sites
- Mainstream and TSS Monitoring Sites
- Tributary Sampling Sites
- Shallow Groundwater Wells
- Nature Preserve and Mitigation Ponds Sampling Sites

0 0.5 1 1.5 2 2.5 3 Miles
2013 AT A GLANCE

• Completed design of the Three Kids, Silver Bowl and Archery weirs

• Began design of the Sunrise Mountain Weir and the Historic Lateral Weir Expansion project

• Completed construction of the Upper Narrows and Duck Creek Confluence weirs

• Initiated construction of the Three Kids Weir

• Received construction bids for the Archery and Silver Bowl weirs

• Installed approximately 6,600 linear feet of bank protection

• Received awards from American Public Works Association and Nevada Associated General Contractors/Nevada Contractor’s Association

PROJECT SUMMARY

Stabilization projects at the Wash aim to reduce erosion and sediment transport, stop the interception of contaminated shallow groundwater and provide a stable platform for ecological and recreational improvements.
Since the inception of the program, 16 of the planned 22 permanent weirs are now operational at the Wash, upstream of Lake Las Vegas. The National Park Service (nps.gov) also has installed three grade control weirs downstream of Lake Las Vegas, with five additional weirs planned. These weirs help slow the flow of water, which helps stop channel bed erosion.

In addition, construction crews have placed more than 11 miles of bank protection along the Wash, above Lake Las Vegas. Much of this work was completed by the Bureau of Reclamation (Bureau, usbr.gov). Bank stabilization efforts help to reduce the ability of Wash flows to erode, undercut and collapse channel banks.

**2013 MAJOR ACCOMPLISHMENTS**

2013 was a busy year in the progression of weir planning and design. Design was completed for the Three Kids, Silver Bowl and Archery weirs, and design began for the Sunrise Mountain Weir. The design of Task Orders 1 and 2 of the weir maintenance program was completed and the engineers started the design of the Historic Lateral Weir Expansion project.

Weir construction also was active. Two weirs were completed in 2013: Upper Narrows and Duck Creek Confluence. Construction of the Three Kids Weir started and bids were received for the Silver Bowl and Archery weirs. A contractor was selected to execute major maintenance work for Wash facilities.

As part of the construction of the Upper Narrows and Duck Creek Confluence weirs, the contractor installed approximately 6,600 linear feet of bank protection in 2013.

In addition, the Wash received awards for some of its most impressive projects. The Homestead and Lower Narrows weirs project received the American Public Works Association Environmental Project of the Year for projects between $5 and $25 million, while the Nevada Associated General Contractors/Nevada Contractor’s Association recognized the Duck Creek Confluence and Upper Narrows weirs as the Construction Project of the Year.

**2014 OPERATIONAL OBJECTIVES**

During 2014, geotechnical exploration of the Tropicana Outfall and D-14 Extension weirs is expected to be accomplished. In addition, the designs of the Historic Lateral Weir Expansion and Sunrise Mountain Weir will be completed, and those of the Tropicana Outfall Weir and D-14 Extension Weir are expected to commence. Construction will continue on the Three Kids Weir, with an expected completion date in spring 2015. Also, the Silver Bowl and Archery weirs are expected to commence construction in February, with an expected completion date of April 2015. Maintenance activities in 2014 will be conducted at the Historic Lateral, Powerline, Bostick and Upper Diversion weirs.
2013 AT A GLANCE
• Finalized the summary report from the fourth round of bioassessment monitoring
• Drafted the plankton selenium study report
• Measured eggshell thickness for comparative study of eggs collected during bioassessment monitoring
• Collected macroinvertebrate samples from along the Wash for selenium analysis

PROJECT SUMMARY
Changing hydrology on the Wash helps improve water quality, but also has the potential to increase accumulation of contaminants behind erosion control structures. Bioassessment monitoring helps the Wash Team assess whether contaminant accumulation is occurring as weirs are completed.
In 2001, a bioassessment monitoring plan identified several objectives to help determine the presence or absence of contaminants of potential concern in the Wash and its tributaries, and to determine if there were any impacts. Bioassessment studies began in 2003 to analyze organic and inorganic contaminants in targeted bird eggs, whole fish, water and sediment. Media has generally been collected biannually; four rounds of sampling have been completed.

Other studies associated with the bioassessment monitoring program include a two-year study examining selenium concentrations in plankton in Lake Mead that concluded in 2012, an eggshell thickness study comparing shells from the four rounds of bioassessment monitoring and a macroinvertebrate study.

2013 MAJOR ACCOMPLISHMENTS

In 2013, the Wash Team finalized the “2010-2011 Bioassessment Monitoring Report,” summarizing results from the fourth round of sampling, and also drafted “Selenium Concentrations of Plankton Collected from Lake Mead, Nevada 2010-2012.” Major findings of both studies were presented in the 2008-2012 Year-End Report.

The Wash Team initiated a study to compare eggshell thickness with contaminant concentrations from egg contents from all rounds of bioassessment monitoring. Eggshell thickness was measured in 2013. Egg content was analyzed during bioassessment monitoring.

Additionally, in 2013, the Wash Team completed two rounds of macroinvertebrate selenium monitoring. Macroinvertebrates, sediment, coarse particulate organic matter and water were collected for selenium analysis. These data will be used to determine how selenium is incorporated into the food web. Sample locations included two reaches of the Wash (upstream of Pabco Road Weir and downstream of the weir) and two tributary sites.

2014 OPERATIONAL OBJECTIVES

In 2014, the thickness of each eggshell will be compared with the contaminant data from the egg’s contents, and a final report will be prepared. The macroinvertebrate selenium data will be analyzed and summarized in a final report, as well. The Wash Team also will pursue using water quality monitoring data as an indicator of potential contaminant accumulation instead of continuing bioassessment monitoring.
2013 AT A GLANCE

- Reviewed and revised the “Las Vegas Wash Surface Water Quality Monitoring and Assessment Plan”
- Converted two real-time monitoring stations into telemetry stations
- Drilled five new shallow groundwater monitoring wells; completed draft long-term monitoring plan
- Uploaded data to Lower Colorado River Regional Water Quality Database
- The Bureau completed benthic macroinvertebrate sampling and published a final report
- Monitored water quality and quagga mussels in Lake Mead

PROJECT SUMMARY

Water quality monitoring is a vital component of the Wash stabilization and enhancement program. Long-term monitoring in the Wash and its tributaries can show if the program is reducing total suspended solids (TSS) and other contaminants, in addition to improving general knowledge of flow volumes and constituents and their potential impacts on the Wash and Lake Mead. Several monitoring programs have been implemented in the Wash and its tributaries since 2000.

Mainstream water quality monitoring is used to evaluate the baseline conditions of the Wash, demonstrate water quality variations over time, quantify the effects of increased wetland vegetation on water quality and provide a long-term history of data that can be used to make watershed-based decisions. The tributary sampling program monitors the effects of urban runoff on the Wash, providing important information on non-point sources of contamination to the Wash and Lake Mead. The flow data collected allows hydrologists to approximate how much urban runoff is entering the Wash.
The extensive selenium monitoring project also is conducted on the tributaries, and samples for both selenium and total dissolved solids. In addition, permanent water quality stations were built along the Wash and its tributaries, and continuously monitor real-time water quality including temperature, pH, specific conductance and dissolved oxygen.

A total of 16 of 22 permanent weirs have been constructed in the Wash. The TSS and perchlorate monitoring program was designed to determine the efficiency of these structures and their associated wetlands at removing TSS from Wash flows. The expanded shallow groundwater monitoring program was established to monitor water quality changes in the shallow groundwater system along the Wash during the construction of the remaining weirs. Monitoring of macroinvertebrates provides valuable data on how water quality changes are impacting biota found along the Wash.

Sampling of Lake Mead is conducted in Boulder Basin, the Overton Arm and Gregg Basin. This sampling provides water treatment operators with up-to-date information on lake conditions and maintains a long-term record of water quality.

2013 MAJOR ACCOMPLISHMENTS

In 2013, the Wash Team continued water quality sampling and monitoring in the Wash and its tributaries (as described above and outlined in the table) and continued to assess and enhance these programs. As a part of the latter process, the “Las Vegas Wash Surface Water Quality Monitoring and Assessment Plan,” originally developed in 2011, was revised with updates and minor modifications from the U.S. Geological Survey (usgs.gov), Bureau, City of Henderson (cityofhenderson.com) and SNWA.

The Wash Team also converted two real-time water quality monitoring stations (LW0.9 and DC_1) into telemetry stations. Monitoring was discontinued at LW11.55 due to construction in the area.

Additionally, as part of the shallow groundwater monitoring program, a total of five new wells were drilled along the Wash. Two of these wells, WMW6.9N and WMW6.9S, located along the Wash at the Duck Creek Confluence Weir, were first sampled in August 2013. Three additional wells, COH2B, WMW4.9N and WMW6.15N, were drilled by SNWA at the end of 2013 and will be sampled starting in 2014. These three wells were replacements for wells that were previously sampled by SNWA but were owned by another agency that had to plug and abandon them in 2011. The Wash Team also completed a draft long-term shallow groundwater monitoring plan, which was under review at year’s end.

Further progress was made on uploading water quality data from all the projects into the Lower Colorado River Regional Water Quality Database (Water Quality Database), accessible via the members’ website. This database allows all the members of the LWWCC to readily access and download data from any of the water quality monitoring programs. For additional discussion, see the Data Resources section.

The Bureau completed benthic macroinvertebrate sampling in the Wash in 2013. The survey data suggest that Wash channel characteristics, such as width, and water quality improvements are the primary drivers of how macroinvertebrate communities are distributed along the Wash. An exotic snail, Melanoides, was found to be associated with the warm waters near wastewater discharges. A final report titled “Stream Macroinvertebrate Assemblages Associated with the Las Vegas Wash Watershed December 2012 and April 2013” was completed.

Storms in the autumn months led to concern that runoff carrying debris and firefighting chemicals from the Carpenter 1 fire on Mount Charleston would enter Lake Mead; however, there was little indication that rain fell in vulnerable areas or that, when it did fall in the correct drainages, the runoff was sufficient to reach Lake Mead. A high flow experiment was conducted in the Grand Canyon during November as part of a continuing effort to supplement sandbars. This event was monitored extensively in Gregg Basin of Lake Mead in order to better assess the potential impact of these experiments as they continue into the future. A preliminary assessment of the data suggests that while the water released during the experiment can be traced in Lake Mead, there will only be impacts under unique scenarios.

Monitoring invasive quagga mussels by measuring the abundance of the juvenile veliger stage continued. Data from 2013 suggests that the population may have stabilized over the past few years. Water quality in Lake Mead remained stable during the year, and overall, the values suggest good water quality in Las Vegas Bay and excellent water quality in the open parts of Lake Mead.

2014 OPERATIONAL OBJECTIVES

All ongoing surface and groundwater quality monitoring programs in the Wash, its tributaries and Lake Mead will continue in 2014. Sample locations, frequencies and analyses for these programs may change as agencies continue to work together to prevent duplication of sampling, while ensuring all monitoring needs are met.
2013 AT A GLANCE
• Treated invasive weeds including common reed, tall whitetop and fivehook bassia
• Planted cottonwood, Goodding’s willow and sandbar willow in riparian areas
• Conducted vegetation monitoring
• Continued water quality monitoring at eight sample locations

PROJECT SUMMARY
Wetlands can help improve water quality by acting as filters for potentially harmful contaminants in the water. They also can provide valuable habitat. Wetland studies at the Clark County Wetlands Park Nature Preserve (Nature Preserve) and in-lieu fee mitigation ponds (Mitigation Ponds) provide the continued opportunity to assess the ability of wetlands to improve water quality and provide other ecosystem services.

The Nature Preserve receives tertiary treated effluent from the Clark County Water Reclamation District (CCWRD, cleanwaterteam.com), which in turn flows into the Mitigation Ponds. Additional flows from the Tropicana Channel also are delivered into the Mitigation Ponds. Eight water quality monitoring locations are located in the Nature Preserve and Mitigation Ponds to quantify changes in water quality and detect changing water quality trends.
Clark County (clarkcountynv.gov) developed the In-Lieu Fee Wetland Mitigation Program to provide off-site wetland mitigation within Clark County. The Mitigation Ponds are the culmination of this program. SNWA signed an agreement with Clark County in 2012 to monitor and manage the project on their behalf. The goal of the project is to create certain acreages of seasonal wetlands, semi/permanent wetlands and mesquite and riparian habitats, in order to meet U.S. Army Corps of Engineers (Corps, usace.army.mil) mitigation requirements. Although permit commitments have not yet been fully achieved, the ponds have already markedly improved environmental conditions at the site by replacing preexisting undesirable vegetation with a higher quality wetland habitat for birds and other wildlife.

2013 MAJOR ACCOMPLISHMENTS
Soil-Tech and Nevada Division of Forestry (NDF, forestry.nv.gov) crews conducted invasive weed treatments at the Mitigation Ponds in 2013. Common reed (Phragmites australis) and removal occurred in the winter and tall whitetop (Lepidium latifolium) treatment took place during the spring.

Volunteers also helped with the clearing of invasive weeds. On November 2 a group of 100 volunteers from Central Christian Youth group removed fivehook bassia (Bassia hyssopifolia) from approximately 10 acres. Then, on November 9, a group of 30 volunteers with the Clark County Stewardship Program removed an additional two acres.

Revegetation efforts continued in 2013. Cottonwood (Populus fremontii), Goodding’s willow (Salix gooddingii) and sandbar willow (S. exigua) pole cuttings were planted by Soil-Tech during the spring within the riparian areas near ponds 5, 6 and 7.

Monitoring of vegetation at the Mitigation Ponds was conducted for the first time in 2013. Each unique habitat type was monitored independently per the requirements of the permit issued by the Corps.

Monthly water quality monitoring continued at eight sample locations in the Nature Preserve and Mitigation Ponds. Samples were analyzed for nutrients, metals, cations/anions and fecal coliform. These data are used by Clark County Parks and Recreation to meet monitoring requirements established in their effluent reuse permit.

2014 OPERATIONAL OBJECTIVES
Revegetation efforts and invasive weed removal will continue at the Mitigation Ponds in 2014, and water levels will be managed to create the acres of seasonal and other wetlands needed to meet the Corps permit requirements. Water quality and flow measurements will continue monthly.

During the World Wetlands Day event scheduled for February 6, 2014, seeding and planting of grasses within the riparian areas of the Mitigation Ponds will be conducted. The grasses will help stabilize the banks of the ponds and compete with invasive weeds, thus hopefully lowering maintenance costs related to weed removal in the future.
2013 AT A GLANCE

- Continued surveys for federally threatened and endangered species
- Identified second known southwestern willow flycatcher on breeding territory
- Conducted first yellow-billed cuckoo surveys since 2004; identified possible breeder
- Continued aquatic bird counts
- Relocated desert tortoise from construction zone
- Continued tamarisk-feeding invertebrate survey; documented first tamarisk leaf beetle larvae
- Identified 28 new invertebrate species

PROJECT SUMMARY

The varied habitats present on the Wash host a diverse wildlife community. Biologists have studied this wildlife for more than 10 years, identifying more than 320 vertebrate species and more than 430 species of insect. While baseline inventories are now complete, surveys for aquatic birds and tamarisk-feeding invertebrates continue. Surveys also continue for federally threatened and endangered species to avoid effects that might impede the progress of the stabilization program.

Wildlife-related activities are guided by the three management objectives established in the “Las Vegas Wash Wildlife Management Plan,” which are to conserve native species, protect and enhance their habitats and increase awareness of these resources within the community.
2013 MAJOR ACCOMPLISHMENTS

2013 was a busy year for bird surveys. Permitted biologists conducted surveys for marsh birds, including the federally endangered Yuma clapper rail, in April and May. No clapper rails were detected in 2013 and none have been identified on the Wash now since June 2006. Of the five other species surveyed using the marsh bird monitoring protocol, field crews detected least bittern, Virginia rail and sora.

Surveys for the federally endangered southwestern willow flycatcher, conducted in May, June and July, identified 10 migrant willow flycatchers and one resident. The resident, a male, established a breeding territory within a stand of cottonwood and willow in the Nature Preserve for more than 30 days. He was target-netted and banded by a permitted bander on June 18. The bird appeared to be unpaired. This is only the second known occurrence of a resident southwestern willow flycatcher on a breeding territory within the study area since surveys began in 1998.

Reports for the marsh bird and southwestern willow flycatcher surveys are available on lvwash.org.

Wash Team biologists initiated surveys for the yellow-billed cuckoo for the first time since 2004. The yellow-billed cuckoo has long been a candidate for federal listing, but on October 2, the U.S. Fish and Wildlife Service (fws.gov) proposed to list the western population of the species as threatened. During the surveys, biologists made single detections of the species in the Nature Preserve on June 27 and July 24. During follow-up visits, staff detected a single bird on August 3, and possibly on August 18. Staff concluded that the bird was a possible, but not confirmed, breeder.

In addition to the above surveys, which are conducted exclusively in the breeding season, Wash Team biologists continued monthly aquatic bird counts at weir sites along the Wash and at the Mitigation Ponds. Franklin’s gull was added to the list of species identified during counts, bringing the total to 71. To date, 52 species have been identified during counts on the Wash, while 66 have been identified at the Mitigation Ponds.

A desert tortoise was encountered at the Wash for the first time since 2011. The mature tortoise was spotted as part of the Three Kids Weir construction project that was just beginning to ramp up activity. The tortoise was relocated approximately 20 feet off of the haul road and behind the existing tortoise fencing. This was the third tortoise that required relocation since the issuance of the 2009 Biological Opinion.

Wash Team biologists continued the tamarisk-feeding invertebrate survey. The survey, which was initiated in 2011, identified tamarisk leaf beetle (Diorhabda carinulata) larvae for the first time (adults were first discovered on the Wash in 2012). The larvae are responsible for the majority of the damage to tamarisk that has been observed throughout the Colorado River watershed in recent years. Along the Wash, a few trees were documented as having substantial defoliation as a result of thousands of larvae consuming the tamarisk leaves. The largest population of tamarisk leaf beetle along the Wash is near the confluence of Duck Creek, which is the location of one of the largest remaining healthy stands of tamarisk in the area.

Informal invertebrate surveys continued in 2013, identifying 28 new species along the Wash. As of the end of the year, a total of 436 invertebrate species had been identified along the channel.

2014 OPERATIONAL OBJECTIVES

Surveys for federally threatened and endangered species will continue in 2014, including surveys for the yellow-billed cuckoo, currently proposed for threatened status. Biologists will conclude aquatic bird counts on the Wash, but the counts may continue at the Mitigation Ponds as part of the wildlife monitoring required in the Corps permit for that project. Desert tortoise monitoring associated with the Three Kids Weir construction project will continue. Finally, the tamarisk-feeding invertebrate survey will be conducted again in the summer to improve the Wash Team’s understanding of how tamarisk defoliation may impact overall restoration goals on the Wash.
2013 AT A GLANCE
• Revegetated just under 25 total acres
• Began utilizing plants grown by SNWA for Wash revegetation
• Cleared approximately nine acres of tamarisk
• Closed Corps permits for revegetation conducted at the CCWRD
• Finalized the “2008-2012 Las Vegas Wash Vegetation Monitoring Report”
• Mapped 175 acres of common reed
• Hosted three meetings of the Las Vegas Wash Weed Partnership

PROJECT SUMMARY
Successful vegetation not only helps meet the “Las Vegas Wash Wildlife Management Plan” objective to protect and enhance habitats, it helps control erosion by stabilizing soils. Vegetation also acts as a filter of contaminants within the Wash, which helps to improve water quality.

The Wash Team has completed approximately 400 acres of revegetation along the Wash since 2000. This includes more than 90 acres of wetlands, of which approximately 50 acres were used to meet Corps permit requirements or were banked for future need. All of the non-wetland acres, as well as the remaining wetland acres, were used to meet requirements for other permits or grants provided to SNWA.
The management of invasive weeds also is an important part of the overall stabilization and enhancement of the Wash. More than 90 percent of the tamarisk has been cleared from the area since the inception of the LVWCC. A total of 1,368 acres of noxious weeds, including tamarisk, tall whitetop and giant reed, have been removed. The majority of the remaining tamarisk will be cleared with future weir construction projects.

2013 MAJOR ACCOMPLISHMENTS
More than 780 volunteers planted 6,875 plants on 17 acres along the Wash during the two Green-Up events held in 2013. The spring Green-Up took place on the south side of the Wash alongside the DU Wetlands No. 1 Weir, while the fall Green-Up was held on the north side of the Wash, near the recently completed Duck Creek Confluence and Upper Narrows weirs. An additional eight acres were planted by Soil-Tech.

The area for the fall Green-Up had approximately five acres of tamarisk cleared by the contractor as part of the construction of the weirs, and an additional four acres of tamarisk were cleared by NDF crews. Approximately 4,800 plants grown by SNWA at the Warm Springs Natural Area were used for the fall Green-Up. These locally-sourced and grown plants reduced costs and also may have a survival advantage over plants purchased from outside vendors.

Three new native plant species were documented at revegetation sites in 2013: Cooper’s goldenbush (*Ericameria cooperi*), winterfat (*Krascheninnikovia lanata*) and chinchweed (*Pectis papposa*). This suggests sites are created in a way that is conducive to other natives establishing in the same location.

The permit for the revegetation activities on the CCWRD property was successfully closed. Located just upstream of the Upper Diversion Weir, this site was planted during the fall 2010 Green-Up.

To document trends in revegetation site characteristics, the Wash Team finalized the “2008-2012 Las Vegas Wash Vegetation Monitoring Report.” The report shows how all revegetation sites established since the Wash project began have changed during the five-year period. Overall, sites increased in total vegetative cover while still having low amounts of invasive species. In addition, survivorship of plants planted during Green-Up events remains more than 80 percent for most sites.

Approximately 175 acres of common reed were mapped along the Wash. Samples of reed were collected from the Wash and other areas within Clark County for the Smithsonian Institute to complete genetic analysis to determine distribution of native and introduced varieties.

The Wash Team also continued meetings of the Las Vegas Wash Weed Partnership to improve effectiveness of weed control along the Wash through collaboration with other agencies. The team hosted three meetings of the partnership in 2013.

2014 OPERATIONAL OBJECTIVES
In 2014, volunteers will help plant areas along the south side of the Wash near the Duck Creek Confluence and Upper Narrows weirs during the spring and fall Green-Ups. In the winter of 2014, the Wash Team will plant additional emergent wetland areas throughout the Wash. The Wash Team also will continue to monitor all revegetation sites to gauge the success of the program and ensure compliance with all permits, as well as continue to monitor and manage invasive weed infestations along the Wash.
2013 AT A GLANCE

- Conducted archaeological testing of Beehive Rockshelter site
- Completed reconstruction of historic milk house at Clark County Museum
- Hosted three meetings of the Cultural Resources Coordinating Committee

PROJECT SUMMARY

There is evidence of people living along the Wash and utilizing its rich environmental resources dating back more than 2,500 years. The Wash is one of the most important sources of cultural history in southern Nevada, and, in 1977, the area was designated as the Las Vegas Wash Archaeological District.

It is the responsibility of the Wash Team and its staff and contracted archaeologists to record, protect and interpret the Wash’s cultural resources. In 2011, a Programmatic Agreement, a formal agreement providing guidelines for the Section 106 consultation process for cultural resources within the Clark County Wetlands Park (Wetlands Park), was implemented between the Bureau, Clark County, SNWA and other stakeholders.

The Cultural Resources Coordinating Committee (CRCC) meets quarterly to review construction developments, research questions and give updates on activities within the Wetlands Park. The collaboration of all stakeholders in addressing these projects has led to a much clearer understanding of the roles of each agency in protecting cultural resources, saving both time and expense.
2013 MAJOR ACCOMPLISHMENTS

In March, requested by the Bureau and sponsored by SNWA, HRA, Inc. Conservation Archaeology (HRA) conducted a limited test excavation at the Beehive Rockshelter site. This site was first identified by the Nevada Archaeological Survey in 1975 and previously recorded by HRA in 2000. With the completion of trails in the Wetlands Park, it was thought that the Beehive Rockshelter might see increased attention. A limited test excavation was proposed to determine the nature and depth of the deposits in the rockshelter.

Excavations revealed stratified deposits, including ephemeral hearths in natural and midden deposits in successive strata. The artifacts recovered included 196 ceramic sherds, 52 chipped stone artifacts, including Rosegate and Cottonwood Triangular points, 1,127 pieces of chipped stone debitage, 36 ground stone pieces, three shell bead fragments, two pendants and one incised stone.

Radiocarbon dates from the thermal features indicate mostly late-period activity. When compared to the artifactual evidence, two periods of activity are suggested: A.D.1100-1400 and A.D. 1690-1850. The artifact assemblage and radiocarbon dates indicate sporadic use with no formal construction. The Beehive Rockshelter was likely used as a short-term campsite for resource procurement in the summer months.

The report for this work is being finalized, after which it will be submitted to the State Historic Preservation Office for approval.

Another major accomplishment in 2013 was the reconstruction of the historic milk house at the Clark County Museum. The structure was discovered during final preparations of the Lower Narrows Weir construction and was fully excavated by archaeologists, disassembled stone by stone and donated to the museum. The required engineering design and construction plans were finalized early in the year and construction began in March. Using detailed photographs from the original structure, the milk house was reassembled by matching each stone and returning more than 95 percent of them to their original position. The structure was capped with a period appropriate wooden shingled roof, as it may likely have existed when originally constructed approximately 110 years ago. Four viewing windows were cut into the roof to allow visitors to peer into the structure and view several original artifacts that were recovered during the excavation. The structure was officially dedicated by the museum in a ceremony presided by Commissioner Mary Beth Scow on November 16.

Over the course of 2013, the Wash Team hosted three meetings of the CRCC. Major topics discussed by the group include the aforementioned Beehive Rockshelter excavation and milk house reconstruction, potential impacts to cultural resources from the construction of Wetlands Park trails and Three Kids Weir, and the possibility of partnering with the Bureau of Land Management’s Volunteer Site Steward Program to help monitor sites in the future.

2014 OPERATIONAL OBJECTIVES

The Beehive Rockshelter testing report will be finalized in 2014, and the CRCC will continue to address any future cultural resource needs or opportunities to meet the requirements of the Programmatic Agreement.
2013 AT A GLANCE

- Completed the “Las Vegas Wash Outreach Plan, 2013”
- Continued educational outreach with Mabel Hoggard Math and Science Magnet School
- Hosted third annual World Wetlands Day event
- Held two Green-Ups
- Hosted or attended 30 total outreach events, with more than 24,000 participants

PROJECT SUMMARY

From the very beginning, public outreach was recognized as being critical to the success of the Wash project. In the 15 years since the LVWCC initiated its public outreach program, the Wash Team has participated in approximately 550 events and reached more than 220,000 people with Wash-related messages. To guide the outreach program into the future, the Wash Team prepared a new outreach plan detailing goals and core messages that was completed in 2013.
Some of the Wash Team’s most successful outreach efforts include volunteer events such as the Green-Up plantings. In addition to being important to revegetation on the Wash, Green-Ups are a vital component of the outreach program. The events give people hands-on experience with the Wash project, providing them with a sense of ownership in the LWCC’s efforts. Other forms of outreach that have proven successful include student outreach such as the Wash Team’s long-standing relationship with Mabel Hoggard Math and Science Magnet School, tours and presentations, and attendance at various community events.

The Wash Team also takes advantage of its numerous online and electronic forms of communication to reach out to the community. The Wash Team manages two websites, one for the public and one for stakeholders, distributes a monthly newsletter (formerly known as the Email Update) and, in more recent years, established a Facebook page to further engage the public and provide a steady stream of project information.

2013 MAJOR ACCOMPLISHMENTS

The “Las Vegas Wash Outreach Plan, 2013” was finalized. The plan reafirms goals from prior planning documents, while providing a renewed focus for future outreach efforts. It outlines effectiveness monitoring objectives and provides techniques to ensure the LWCC outreach goals are met. The document also defines target audiences, tactics and evaluation methods for outreach activities.

Also in 2013, the Wash Team continued its partnership with Mabel Hoggard Math and Science Magnet School by providing daylong field trips to the Wash and Lake Mead for its fifth grade students. Students participated in water quality monitoring, learned about the water cycle and identified different habitats found along the Wash.

The Wash Team and Wetlands Park hosted a third annual World Wetlands Day event on January 31 at the Nature Center and Mitigation Ponds. The event attracted 250 attendees, 14 exhibitors and 25 volunteers from partnering agencies. Activities included visiting agency exhibits, fashioning bird feeders, attending live animal demonstrations and weeding.

As stated in the Vegetation Enhancement and Management section, two Green-Up events were hosted in 2013. The first, held March 16, included 366 volunteers that planted 3,000 plants covering 7 acres. Then, on October 5, 417 volunteers planted 3,875 plants on 10 acres.

In all, the Wash Team hosted or attended 30 outreach events in 2013, with a total participation of more than 24,000 people.

The Las Vegas Wash Facebook page continued to grow, reaching 269 “likes” by year-end, and nearly 500 newsletters were distributed monthly. Details of the newsletter and Facebook page are described in the Data Resources section.

2014 OPERATIONAL OBJECTIVES

Implementation of the new outreach plan will begin in earnest in 2014, including initiation of effectiveness monitoring. There will be two Green-Ups, one in both the spring and fall. In addition, the Wash Team and Wetlands Park will host World Wetlands Day on February 6 at the Nature Preserve. Participation in community events and the partnership with Mabel Hoggard also will continue.
2013 AT A GLANCE

- Hosted more than 33,000 visits from 22,804 unique visitors at lvwash.org
- Reached 269 Facebook followers
- Initiated substantial revision of lvwash.org
- Managed and supported 50 page updates and added 23 new PDFs and 43 new images to lvwash.org
- Processed more than 150 contact requests
- Provided monthly newsletter to nearly 500 subscribers
- Processed new digital aerial imagery
- Completed structural enhancements and added 11 new projects and 242,633 lines of data to the Water Quality Database

PROJECT SUMMARY

For more than a decade, the Wash Team has developed websites, mapping applications, databases and other tools that enable the LVWCC to share project progress with the community and enhance communication and collaboration among its members.

The lvwash.org website keeps the public updated on the LVWCC’s activities and features monthly articles, details about upcoming Wash events and a comprehensive review of Wash Team research. The members’ password-protected site accessible via lvwash.org expedites communication among stakeholders and provides access to a variety of applications, including the Water Quality Database and Image Repository. It also provides contact information and a calendar of activities and meetings with links to agendas and summaries.
To further engage the community, as well as stakeholders, the Wash Team distributes a monthly newsletter and is active on its Facebook page (facebook.com/lvwash).

High resolution aerial imagery is flown, processed and stored as needed to provide researchers and managers with base maps for wildlife surveys, vegetation monitoring, planning documents and tracking changes at sites over time, among other purposes.

The Water Quality Database allows members to import, view and download data. Field and sample data collected by SNWA and other agencies are managed and imported into the database. It currently provides access to 4,136,255 lines of water quality data from 41 different sampling projects covering 662 sites.

2013 MAJOR ACCOMPLISHMENTS

In 2013, the lvwash.org website hosted more than 33,000 visits from 22,804 unique visitors, averaging 1,900 unique visitors each month, an increase of nearly 5 percent from 2012.

In an effort to further draw the public’s interest to activities related to progress and improvements at the Wash, a Facebook page was launched on July 25, 2012. Fans of the page increased by more than 80 percent in 2013, totaling 269 by year’s end. Topics ranged from flash floods in the Las Vegas Valley, to the kick-off of construction of the Three Kids Weir and much more. A total of 19 photo galleries house more than 125 images. The Facebook page also has increased traffic to lvwash.org, as seen in the year over year increase in average unique visitors observed since the Wash Team launched the page.

In addition, the lvwash.org website highlighted 12 monthly features on its home page. Topics included the LWCC’s fifteenth anniversary, Green-Up planting events, the restoration of the historic milk house and more. The Wash Team also began a substantial revision to the website. The “Visiting the Wash” and “What can I do to help” sections of the site were reorganized to increase usability. The next step will be a complete overhaul of the site’s design to freshen up the look and improve the user experience.

Team members also managed and supported more than 50 page updates and added 23 new PDFs and 43 new images to the lvwash.org site. In addition, they received and processed more than 150 contact requests filled out by site visitors.

The Wash Team continued monthly emails to nearly 500 subscribers. Topics of these newsletters (formerly known as the Email Update) covered updates on Wash Green-Up events, the World Wetlands Day celebration, the grand opening of the Wetlands Park Nature Center and the banding of a southwestern willow flycatcher for only the second time at the Wash. Also in 2013, the newsletter received a much-needed and dramatic redesign.

New aerial imagery was flown in June, and was processed and stored. As anticipated, structural enhancements were implemented to the Water Quality Database in 2013, which bring together a variety of information supporting the water chemistry data. Visitors can access detailed information concerning water quality projects, as well as site and spatial features. A new search for water quality documents was added as well, providing easy access directly from the password-protected website. Other database activities in 2013 included the addition of 11 new projects covering 265 sites and the input of 242,633 lines of data.

2014 OPERATIONAL OBJECTIVES

Web designers will complete the facelift of lvwash.org in 2014. The Wash Team also will seek to attract more subscribers to the newsletter and fans to the Facebook page, and drive more traffic to the updated website.
Mission: working to stabilize and enhance the valuable environmental resources of the Las Vegas Wash