las vegas wash coordination committee

2016 year-end report
LAS VEGAS WASH COORDINATION COMMITTEE

Basic Management, Inc.
Bureau of Reclamation
Citizen Members
City of Henderson
City of Las Vegas
City of North Las Vegas
Clark County Department of Air Quality and Environmental Management
Clark County Parks and Recreation
Clark County Regional Flood Control District
Clark County Water Reclamation District
Colorado River Commission
Conservation District of Southern Nevada
Desert Wetlands Conservancy
Lake Las Vegas Resort
Las Vegas Boat Harbor
National Park Service
Natural Resources Conservation Service
Nevada Department of Wildlife
Nevada Division of Environmental Protection
Nevada State Health Division
Southern Nevada Health District
Southern Nevada Water Authority
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Geological Survey
University of Nevada, Las Vegas

LAS VEGAS VALLEY WATERSHED ADVISORY COMMITTEE

City of Henderson
City of Las Vegas
City of North Las Vegas
Clark County
Clark County Regional Flood Control District
Clark County Water Reclamation District
Las Vegas Valley Water District
Southern Nevada Water Authority
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In the desert, where every drop of water counts, the Las Vegas Wash (Wash) captures approximately 200 million gallons of highly-treated effluent, urban runoff and shallow groundwater—as well as stormwater from occasional rain events—every day. The Wash acts as a natural filter as it channels the water to Lake Mead, southern Nevada’s primary source of drinking water. Wetlands in the Wash channel help filter sediment and other impurities from its flows.

These flows increased significantly as southern Nevada’s population increased. The increased flows, made worse by large storms, caused massive erosion of the channel’s bed and banks, threatening wildlife habitats, water quality and wastewater infrastructure.

The Las Vegas Wash Coordination Committee (LVWCC) formed in 1998 to address long-term management and protection of this integral waterway. The LVWCC developed the Las Vegas Wash Comprehensive Adaptive Management Plan (CAMP)—a blueprint that includes 44 specific action items—to address the challenges facing the Wash. The LVWCC also created study teams and an oversight committee, the Las Vegas Valley Watershed Advisory Committee (LVVWAC). The Las Vegas Wash Project Coordination Team (Wash Team) is the implementation arm of the LVWCC.

The LVVWAC presents in this report maps of locations and activities, a summary of the LVWCC’s progress on CAMP action items, and descriptions of accomplishments from the last year and operational objectives for 2017 for eight programs.

### BUDGET, 2016

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* Nevada Division of Environmental Protection Grant

Fiscal year July 2016–June 2017

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**from the chair**

Dear Friends:

Motivation, enthusiasm and spirit can lead you to achieve nearly anything—and you don’t have to look far for the evidence. The Las Vegas Wash is a living example of what we can accomplish when we work together. In 2016, we began building our 20th weir, revegetated 44.5 acres with native plants, conducted surveys for threatened and endangered species and hosted 250 high-school students during a two-day science symposium to observe World Wetlands Day.

These achievements, and those of the past 18 years, would not have been possible without the stakeholders who make up the Las Vegas Wash Coordination Committee, our volunteers and the support of the public. You have been vital to our success and we are grateful.

Before you read the 2016 Las Vegas Wash Coordination Committee Year-End Report, I would like to highlight a change to the report’s design that reduces the number of pages; instead of a two-page spread, each program is now presented on a single page. This honors our sustainability ethic and helps meet online publication standards.

Although reduced in length, the core of the document remains the same—rich content supported by striking imagery—enabling you to see the effects of our efforts and how your continued support and collaboration helps us succeed in preserving this desert oasis. While I am proud of our achievements, we have more milestones to accomplish together. I look forward to carrying on this valuable work with you.

Sincerely,

Zane L. Marshall
Las Vegas Valley Watershed Advisory Committee Chair
LOCATIONS MAP

1. Upper Diversion Weir
2. Monson Weir
3. Visitor Center Weir
4. Nature Center
5. Tropicana Weir
6. DU Wetlands No. 2 Weir
7. DU Wetlands No. 1 Weir
8. Silver Bowl Weir
9. Archery Weir
10. Duck Creek Confluence Weir
11. Upper Narrows Weir
12. Sunrise Mountain Weir
13. Pabco Road Weir
14. Historic Lateral Weir
15. Bostick Weir
16. Calico Ridge Weir
17. Lower Narrows Weir
18. Homestead Weir
19. Three Kids Weir
20. Rainbow Gardens Weir
21. Powerline Crossing Weir
22. Fire Station Weir

LEGEND

- Clark County Wetlands Park
- Nature Preserve
- In-lieu Fee Mitigation Wetlands
- Existing Weirs
- Weir Under Construction
- Planned Weir

ACTIVITIES MAP LEGEND

- Bureau of Reclamation Stabilization Work
- Tropicana Weir Design
- Mainstream and Total Suspended Solids/Perchlorate Monitoring Sites
- Tributary Sampling Sites
- Selenium Sampling and Tributary Stream Gaging Sites
- Real-Time Monitoring Sites
- Shallow Groundwater Monitoring Sites
- Mitigation Wetlands Sampling Sites
- Marsh Bird Monitoring Sites
- Southwestern Willow Flycatcher Survey Sites
- Yellow-billed Cuckoo Survey Sites
- Avian Point Count Sites
- Aquatic Bird Count Sites
- Green-Up Plantings
- Other Plantings

- Lake Las Vegas
Erosion and Stormwater, administered by the Operations Study Team

1. **Install erosion control structures** – Nineteen of 21 planned erosion control structures (i.e., weirs) in place.
2. **Obtain topography and geophysical data** – Semi-permanent ground control points established; topography and geophysical data collected as needed to facilitate weir design and construction.
3. **Conduct sediment transport modeling** – Models developed using standard computer programs; model runs conducted as needed to understand system function and inform weir design.
4. **Establish off-stream wetlands with alternate discharge considerations** – Feasibility study prepared; concluded wetlands should be established within active flood plain.
5. **Evaluate stormwater detention/retention basins** – Addressed by Clark County Regional Flood Control District (CCRFCD) master plan.

Alternate Discharge, administered by the LVWAC, action items 6 – 10

Deemed unnecessary for the foreseeable future.

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

Jurisdictional and Regulatory, administered by the LVWAC and LVWCC

16. **Further investigate and define structure for local oversight of the Las Vegas Wash Comprehensive Adaptive Management Plan** – Established by interlocal agreement, creating the LVWAC; members act on behalf of their governing boards and councils. Southern Nevada Water Authority (SNWA) appointed lead agency.
17. **Ensure interagency coordination** – Regular meetings convened by managerial, technical and administrative staff.

Public Outreach, administered by the Administrative Study Team

18. **Establish a method to continue implementation of the public outreach program** – Implementation funded annually and directed by the 2013 update of the outreach plan.
19. **Continue implementation of feedback mechanisms and measurements of progress and results** – Feedback obtained at events and on lvwash.org. Progress measurements (e.g., website visitors, event attendees, number of events, etc.) recorded and reported quarterly to the LVWAC and in annual reports.
20. **Provide updates to elected officials** – Member agencies use the Wash newsletter and year-end reports to keep elected officials informed.

Funding, administered by the Administrative Study Team

21. **Further investigate potential funding sources identified by the team** – Funding sources 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 reviewed and approved by the LVWAC annually. Operating expenditures not reimbursed by state, federal or private grants are paid for by the City of Henderson (5.2%), City of Las Vegas (9.4%), City of North Las Vegas (3.6%), Clark County (10%), CCRFCD (10%), Clark County Water Reclamation District (21.8%) 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 vetted by the study teams and Wash Team; assessment and prioritization criteria include feasibility, cost, need for and importance of information and program benefit.
25. **Utilize existing resources and staff, whenever possible** – Regular meetings among stakeholders ensure coordination and help to prevent duplication.
Shallow Groundwater, administered by the Research and Environmental Monitoring (REM) Study Team

26. Develop a central database – Database developed; data added when made available.
27. Locate and inventory existing shallow monitoring wells – Valley wells located and inventoried using existing data and geospatial technologies.
28. Identify issues of concern – Ongoing monitoring programs and stakeholder data sharing forums provide for early detection of issues of concern.
29. Develop a long-term monitoring plan – Plan finalized and implemented.
30. Develop a method to identify the potential for future contaminant discovery – Data regularly assessed to evaluate potential concerns.
31. Develop and implement a notification plan – Managed by outside agencies.
32. Promote interagency coordination – See item 17.
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 – Plans complete; updates and other activities ongoing to achieve goals.
41. Conduct additional research – Various studies ongoing.
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 and created a cultural resources management plan to guide future activities.
43. Identify funding needs – Funding needs vetted by the study teams and Wash Team.
44. Facilitate interagency coordination to ensure projects are implemented – See item 17.
PROJECT SUMMARY

Stabilization is a critical, foundational step for the long-term management of the Wash and helps protect the Wash’s water quality, creates a platform for revegetation efforts and conserves and creates wildlife habitat.

The LVWCC has completed 19 of 21 planned permanent weirs upstream of Lake Las Vegas and installed more than 12 miles of bank protection. Downstream, the National Park Service completed three grade control weirs. Another weir is currently under construction, with five more planned.

2016 IN REVIEW

Early in winter, Bureau of Reclamation (Bureau) construction crews replaced rock riprap on the crest and chute of the Calico Ridge and Powerline Crossing weirs; they also reconstructed a nearby access ramp.

In addition, the Bureau cleared a narrow flood channel through the center of an island between the Bostick and Calico Ridge weirs, balancing the hydraulic needs of the reach and the wildlife habitat values of the island, which is dense with riparian trees and home to several species of birds. The compromise was successful, allowing flood flows to pass through while continuing to provide nesting habitat. As an example, a Cooper’s hawk pair raised three young there in the spring.

Later in winter, the contractor that constructed Archery Weir replaced riprap on the structure that had begun to deteriorate.

Design of the Tropicana Weir was completed in August and out for bid in October. Construction commenced in December with an expected completion date of July 2018. The confined rock riprap structure will contain more than 100,000 tons of material and include 2,000 linear feet of bank protection. A 200-foot spillway to the south will help dissipate overflow energy.

As a part of construction, the Clark County Water Reclamation District (CCWRD) soil stockpile site will be closed and revegetated. The land between the new Tropicana Weir and existing Clark County Wetlands Park Nature Preserve (Nature Preserve) will be cleared and revegetated with native species to enhance wildlife habitat and to make the area more attractive for park visitors.

The Sunrise Mountain Weir—the last remaining erosion control structure to be built—will be coupled with the expansion of the existing Historic Lateral Weir. This project has been delayed for more than two years due to ongoing coordination with the Nevada Division of Environmental Protection (NDEP) and the Nevada Environmental Response Trust (NERT).

A partnership with NDEP and NERT to treat pumped Wash water for perchlorate and return the treated flows to the channel during construction is in progress. The Southern Nevada Public Land Management Act may potentially provide grant funding to help offset capital costs associated with the Sunrise Mountain Weir.

2017 OPERATIONAL OBJECTIVES

Bureau crews will conduct improvements to the Upper Diversion Weir impoundment early in the year. Construction will continue on the Tropicana Weir throughout 2017.

Pending NDEP plans for a treatment system in the construction, Historic Lateral Weir expansion and Sunrise Mountain Weir project bidding may occur. This is the last large-scale project planned for the Wash.
PROJECT SUMMARY

Long-term water quality monitoring increases knowledge of Wash flows and potential impacts on Lake Mead. Quarterly sampling on the mainstream is used to evaluate baseline conditions and demonstrate variations over time, while on the tributaries, it characterizes urban runoff and its effects on the Wash. Hydrologists use monthly flow data from tributary sites to estimate the volume of runoff entering the Wash. Three real-time water quality monitoring stations supplement these programs, measuring four parameters continuously.

The wetland systems formed by the LWCC’s efforts are efficient at removing total suspended solids (TSS) from Wash flows. The monthly TSS and perchlorate monitoring program measured a 60 percent reduction in TSS, resulting in the Wash’s removal from the 303(d) list of impaired waters in Nevada. Monitoring of wells on a quarterly basis quantifies changes in the shallow groundwater system along the channel.

The bioassessment monitoring program was developed in 2001 to address concerns about the endangered razorback sucker and how the impoundments behind weirs may impact habitat downstream in Lake Mead. Four rounds of monitoring have been completed, sampling water, bird eggs and fish. Sediment was also sampled in the first three rounds. As an extension of bioassessment monitoring, sampling occurs monthly on eight tributaries for selenium and total dissolved solids (TDS).

Project managers created the Las Vegas Wash Surface Water Quality Monitoring and Assessment Plan to coordinate monitoring and reduce duplication of effort. They review the plan annually and update it as needed.

2016 IN REVIEW

Hydrologists collected samples for all programs as scheduled. Ongoing construction along and upstream of the Wash and its tributaries was reflected in the data by small periodic increases in TSS. While most programs were unchanged, a new real-time Hydrolab® station was installed at LW11.1 with Bureau grant funding. Water quality at this location reflects the combined flow from Flamingo Wash, the upper Las Vegas Wash and Sloan Channel which includes effluent discharge from the City of North Las Vegas. The other two Hydrolabs®, DC1 (on Duck Creek) and LW0.8 (on the Wash below Lake Las Vegas), recorded data for all of 2016 with no major gaps.

The final report was completed for the shallow groundwater monitoring study funded by the CCWRD in 2015, in which 50 wells and springs were sampled for water quality and hydrogeological data.

Further progress was made on uploading data into the Lower Colorado River Water Quality Database (see Data Resources). The database allows members to upload, search, view and export data from monitoring programs along the Wash, Lake Mead, and Muddy and Virgin rivers, among other locations.

No bioassessment monitoring was conducted during 2016. Instead, the Wash Team continued to reevaluate the program and discuss the future of sampling with the Bureau. The U.S. Environmental Protection Agency recently established a new aquatic life ambient water quality criterion for selenium. This new criterion, with lower concentration limits than prior standards, may require bioassessment sampling to continue.

2017 OPERATIONAL OBJECTIVES

All ongoing water quality monitoring programs in the mainstream Wash and its tributaries will continue.
**PROJECT SUMMARY**

Stabilization and revegetation activities on the Wash are increasing wetlands along the channel. These wetlands provide valuable ecosystem services, improving water quality and increasing wildlife habitat. The Wash Team conducted wetland demonstration projects at a wastewater treatment facility and along a valley tributary to further quantify these services. These studies concluded several years ago. Current wetland projects focus on the in-lieu fee mitigation wetlands (Mitigation Wetlands) and genotypes of common reed (*Phragmites australis*).

Clark County developed the Mitigation Wetlands to provide off-site wetland mitigation and the Wash Team manages the wetlands on the County’s behalf. The goal is to create the seasonal, semi-permanent and permanent wetlands and riparian habitats needed to meet the U.S. Army Corps of Engineers (Corps) permit requirements. The Nature Preserve receives tertiary-treated effluent from the CCWRD, which flows into the Mitigation Wetlands. Additional flows from the Tropicana Floodway Channel also enter the wetlands. The Wash Team monitors water quality and aquatic birds (see Wildlife) at the site to quantify changes and detect trends.

Common reed is widely distributed throughout wetlands in the Wash and its tributaries. With the assistance of the Wash Team, the University of California, Santa Barbara (UCSB) conducted research that revealed hybridization between native and introduced (invasive) genotypes.

**2016 IN REVIEW**

During the spring, crews removed tall whitetop and fivehook bassia, weeds that continue to be a management challenge at the Mitigation Wetlands. The Wash Team and Clark County met with the new Corps representative to discuss progress towards meeting permit requirements. Based on that meeting, project managers began enhancements to cells 5, 6 and 7. Water was removed to create platforms for planting and areas of common reed were cleared from cells 6 and 7. Volunteers revegetated 5.5 acres with 4,500 riparian and wetland plants from 12 species at the two cells during the fall Wash Green-Up (see Vegetation Enhancement and Management and Education and Outreach).

Monthly water quality monitoring continued at the two sample locations in the Mitigation Wetlands. The Wash Team monitored and reported TDS, nitrate as nitrogen, chloride, phosphate, sulfate and fecal coliform. The Wash Team reported flow data from the CCWRD pipeline and data collected by CCWRD for a third site, in compliance with Clark County Parks and Recreation’s National Pollutant Discharge Elimination System permit. The project manager replaced the flow meter and sampler in 2016 due to mechanical issues.

A study funded by Clark County and completed by UCSB in 2015 showed hybridization between native and non-native common reed is taking place along the Wash, an occurrence rarely documented elsewhere. A manuscript on the study was published in “Biological Invasions” in May.

**2017 OPERATIONAL OBJECTIVES**

Enhancements to cells 5, 6 and 7 including revegetation with native species will continue, as will weed control. Water levels will be raised in the spring to irrigate the vegetation during the growing season and to create the acres needed to meet the Corps permit requirements. Water quality and flow measurements will continue monthly.
PROJECT SUMMARY
While enhancing the Wash, the LVWCC has created a variety of habitats that abound with vertebrate and invertebrate wildlife. To establish baselines and determine changes over time, the Wash Team has researched the taxa present, and in 2008, the team released the Las Vegas Wash Wildlife Management Plan. The plan established three objectives: conserving native species, protecting and enhancing their habitats and increasing environmental awareness of these resources in the community. Biologists continue to conduct wildlife surveys along the Wash in support of the plan and for regulatory compliance related to the Endangered Species Act.

2016 IN REVIEW
Permitted biologists conducted surveys targeting the endangered Yuma Ridgway’s rail and five non-listed marsh bird species in spring. The Wash Team has conducted this monitoring for ten years and found no Ridgway’s rail or black rail. Crews have identified least bittern, Virginia rail and sora every year and American bittern twice. The number of individuals detected of the three consistently observed species has varied over time, neither increasing nor decreasing for more than three consecutive years. Detections declined from 2015 to 2016, possibly due to impacts from April flooding and management actions such as habitat clearing.

Surveys for the endangered southwestern willow flycatcher identified three migrant willow flycatchers (subspecies unknown). This is the lowest number detected since 2010 and represents a second consecutive year of declines, which may be the result of riparian habitat loss related to weir construction. In addition, biologists detected a migrant yellow-billed cuckoo during a survey for the threatened species in July. Survey reports were submitted to the U.S. Fish and Wildlife Service for permit compliance.

The Wash Team also conducted compliance-based monitoring for the threatened desert tortoise, surveying for the species during stabilization activities early in the year. No tortoises were observed.

Great Basin Bird Observatory continued biweekly avian point counts along the Wash and detected a Yuma Ridgway’s rail above the Pabco Road Weir during vegetation monitoring in October (the bird has not been reported since). The counts have shown significant increases in both the number of species and individuals detected.

Aquatic bird counts concluded at the Mitigation Wetlands after seven years. The counts detected more than 70 species. A report on the first 5 years of the study, including surveys at the Wash, was submitted to the Bureau for grant compliance.

The Wash Team continued invertebrate research, tagging three monarchs as part of the Southwest monarch study. The team also identified two new invertebrate species at the Wash, one of which, Poecilonota bridwelli (a metallic wood-boring beetle), was a state record. The total number of cataloged invertebrate species is now 470. Finally, data from the 2011-2014 northern tamarisk beetle surveys was published in “The Southwestern Naturalist.”

2017 OPERATIONAL OBJECTIVES
Surveys for threatened and endangered species will continue, as will avian point counts, monarch-tagging and informal invertebrate inventories. Wash Team biologists will also conduct a fish survey along the Wash to determine whether changes have occurred since the 2002-2003 survey.
**PROJECT SUMMARY**
Vegetation enhancement and management along the Wash helps meet permit requirements for stabilization projects, while also protecting and enhancing habitats as laid out in the wildlife plan. Additionally, this work furthers soil stabilization, improves water quality and increases the aesthetics of the Wash and the Clark County Wetlands Park (Wetlands Park). Nearly 470 acres have been revegetated along the Wash since 2000, approximately half of which was planted by volunteers. Wetlands—as defined by the Corps—make up about 125 acres. Non-wetland areas make up the remaining and provide a buffer for the more fragile wetlands, while also meeting grant and permit requirements.

Ongoing treatment of tamarisk and other noxious weeds helps ensure the survival and sustainability of this native vegetation. More than 1,400 acres of tamarisk have been removed since the inception of the LVWCC.

**2016 IN REVIEW**
The Wash Team hosted two Green-Ups in 2016: one at the Archery and Silver Bowl weirs in spring and one at the Mitigation Wetlands in fall. Between the two events, volunteers revegetated 14 acres with more than 7,000 plants from 18 species (see Wetland Demonstration Projects and Education and Outreach). These plants came from a variety of sources including the propagation facility at the Warm Springs Natural Area near Moapa, which is owned and operated by SNWA.

Soil-Tech planted more than 30 acres along the Wash. These plantings included over 20 acres near the Bostick Weir, following the removal of the largest remaining stand of tamarisk along the Wash. This revegetation was paid for by Bureau grant dollars, an important funding source for vegetation enhancement and management along the Wash. The contractor also planted the banks at the Archery and Silver Bowl weirs and Three Kids Weir to meet Corps permit requirements. Excess soil from the Three Kids Weir site was deposited on top of the bank protection at the Lower Narrows and Homestead weirs and was planted with riparian vegetation.

Biologists conducted annual vegetation monitoring in the fall. The report detailing 2015 data was also completed, cataloging the species found at each revegetation site and their relative cover, as well as the total cover of all vegetation on each site.

Survivorship of planted vegetation was also measured but only on the most recently established sites. Of the 112 sites monitored, 62 percent had the same cover as the prior year, 9 percent increased in cover, and 17 percent decreased in cover; the remaining 12 percent were new.

A report detailing wetland impacts related to the construction of the Archery and Silver Bowl weirs and Three Kids Weir was submitted to the Corps, meeting compliance requirements and closing the permits for the two projects. These areas were planted with a variety of wetland and riparian species, including bulrush, sandbar and Goodding’s willow and Fremont’s cottonwood.

**2017 OPERATIONAL OBJECTIVES**
Volunteers will plant non-wetland areas near the Three Kids Weir for the spring 2017 Green-Up, and Soil-Tech will plant wetland and emergent vegetation. Invasive weeds also will be monitored and controlled with the help of renewed agency partnerships. The Wash Team will continue to monitor revegetation sites and will create planting plans for the Tropicana Weir, Sunrise Mountain Weir, and expansion of Historic Lateral Weir.
2016 AT A GLANCE
- Excavated features at the Larder site and revealed a series of nested pits and a potential habitation structure
- Conducted compliance fieldwork for Tropicana Weir construction
- Hosted three meetings of the Cultural Resources Coordinating Committee
- Completed compliance review and comments for 2017 stabilization work

PROJECT SUMMARY
Natural resources provided by the Wash have attracted people to its banks for thousands of years. The artifacts and structures they left behind led the area to be designated as the Las Vegas Wash Archaeological District in 1977. It is the responsibility of the Wash Team, of its staff and contracted archaeologists to record, protect and interpret the Wash’s many cultural resources.

A 2011 programmatic agreement (PA) provides guidelines for the Section 106 consultation process for cultural resources within the Wetlands Park, and outlines responsibilities between the Bureau, Clark County, SNWA and other stakeholders. As part of the PA the Cultural Resources Coordinating Committee (CRCC) was created and meets quarterly to review construction developments, research questions and give updates on activities within the Wetlands Park. This collaboration of stakeholders has led to a much clearer understanding of the roles of each agency in protecting cultural resources, saving both time and expense.

2016 IN REVIEW
Work has been ongoing at the Larder site since 2013 to support design and construction of the Tropicana Weir. In 2015, geophysics activities identified potential buried cultural features. Testing of those features indicated that larger excavations were necessary. Cultural resource contractors partially excavated them in April and May 2016, thanks to grant funding from the Bureau.

The excavation of the first feature revealed a series of nested pits used as storage or roasting pits. Radiocarbon dating of the contents will help archaeologists better understand the use-life of the site and the timing of activities and occupation. Paleobotanical studies will reveal which plants were exploited or cultivated at or near the site.

The excavation of the second feature uncovered a potential habitation structure with a central hearth and evidence of “wall fall” from a collapsed structure. In the upper levels of the excavation, archaeologists found a projectile point (arrowhead) and a drill tip, that may indicate a relatively late date (post AD 1100) for this feature. Dates will be confirmed using radiocarbon dates from the hearth. If confirmed as a habitation, this site will be included with Scorpion Knoll and Three Kids, both of which are located at the Wash, and the Springs Preserve, as sites with known evidence of habitation structures in the valley.

Design changes to the Tropicana Weir increased the footprint and prompted further testing for cultural resources adjacent to the Larder site. Eight trenches on the east side and four trenches on the west side were excavated with a backhoe. No significant cultural resources were uncovered.

The CRCC met three times in 2016. Meetings focused on construction activities, Wetlands Park security, and the administration and reporting of the Larder site project.

At year’s end, the Wash Team completed compliance review and comments for 2017 stabilization work.

2017 OPERATIONAL OBJECTIVES
The Larder site excavations report will be completed, and Wash Team staff will continue to support construction and maintenance activities.
2016 AT A GLANCE

- Held two-day science symposium for World Wetlands Day, drawing 250 students
- Conducted outreach with Mabel Hoggard fifth grade classes
- Hosted two Wash Green-Ups, attracting nearly 350 volunteers
- Assisted with events at the Wetlands Park
- Reached more than 11,000 people with Wash messages
- Updated Pocket Naturalist® guide and printed 3,000 copies

PROJECT SUMMARY
Since 1999, the LWCC has worked diligently to inform and educate the public about the Wash and its efforts to stabilize and enhance the channel. During that time, the Wash Team has participated in over 600 events and reached more than 235,000 people with Wash messages to establish long-term community support and enthusiasm for the project. The team has also developed a robust outreach presence online (see Data Resources).

To further guide activities, the Wash Team created the Las Vegas Wash Outreach Plan, 2013. The plan reaffirms past goals and establishes new ones; lays out core messages, strategies and tactics; and describes methods for measuring outreach effectiveness.

2016 IN REVIEW
The Wash Team expanded its celebration of World Wetlands Day to a two-day science symposium that attracted 250 local high-school students. Held at the Wetlands Park Nature Center, each day started with a keynote address and then continued with presentations from professionals on a variety of wetland topics. Students also participated in hands-on activities. Busing was provided with funding from Outside Las Vegas and the Desert Wetlands Conservancy.

The program with fifth graders from Mabel Hoggard Math and Science Magnet School continued. Wash Team staff visited each class, introducing students to the Wash and the important role it plays in local hydrology. On field trip day, students boarded the Desert Princess at Lake Mead where they learned about water quality and food web dynamics. Afterwards, they visited the Nature Preserve where they studied the different habitats and animals found at the Wash.

Wash Green-Ups allow the community to actively participate in the enhancement of the channel, instilling a sense of ownership and pride. The volunteer planting events help stabilize the soil and improve wildlife habitat. During the spring Green-Up, 160 volunteers revegetated 8.5 acres with 2,800 plants, while 180 volunteers revegetated 5.5 acres with 4,500 plants at the fall Green-Up. NDEP provides grant funding for both the Mabel Hoggard and Green-Up programs.

The Wetlands Park and Wash Team united for several events. International Migratory Bird Day drew nearly 400 visitors in April. The Wash Team hosted a bird identification station and staffed an LWCC information booth. Attendees received a Wash Pocket Naturalist® guide to help them identify birds. In addition, the team assisted with the BioBlitz and hosted an information table at the July open house.

The Wash Team also provided in-classroom presentations to schools, gave several Wash tours, and represented the LWCC at community events such as GREENFest. In total, the team hosted or attended 22 events and reached more than 11,000 people with Wash messages.

Finally, the Wash Team updated and reprinted the Pocket Naturalist® guide, which helps meet an objective of the wildlife plan. Three thousand copies were produced thanks to a Bureau grant that also funded the printing of this year-end report.

2017 OPERATIONAL OBJECTIVES
The Wash Team will host its third World Wetlands Day science symposium and two Wash Green-Ups. Mabel Hoggard field trips will continue, and the team will continue to participate in other events in support of the outreach plan.
PROJECT SUMMARY
The LVWCC uses digital media extensively for public outreach. The lvwash.org website provides information on Wash activities, research documents, maps, a photo repository and more. A password-protected portion of the site offers additional features to stakeholders. The Wash Facebook page provides a fast, efficient way for the LVWCC and its members to interact with the public. In addition, a newsletter is delivered to the email inboxes of subscribers on the first day of every month, highlighting accomplishments and promoting upcoming activities.

High resolution imagery plays a vital role in the Wash project. Photos are taken at strategic points along the Wash annually to capture landscape changes over time as part of the photo comparative analysis study. In addition, aerial imagery is flown to provide project managers with base maps and fulfill other needs related to monitoring changes along the channel.

The Lower Colorado River Water Quality Database allows agencies to access, upload and share water quality monitoring data, with data going back more than fifty years.

2016 IN REVIEW
The Wash Team reviewed lvwash.org content in preparation for a significant site update now scheduled for 2018. The goal is to keep the site educational but make it more inviting and user friendly. The website received more than 20,500 visits (1,709/month) from nearly 17,000 unique visitors (1,412/month) in 2016, similar to 2015. Throughout the year, the team supported 146 page updates and refreshed the homepage monthly with articles typically drawn from the Wash newsletter.

The newsletter continued to be delivered to subscribers monthly. Sample topics include new flow gages installed by the U.S. Geological Survey, mosquito protection information and invasive species management. A new email management system filtered out inactive email accounts, reducing subscribership to just below 400.

The Wash Facebook page (facebook.com/lvwash) highlighted exciting project developments, such as the tagging of migrating monarchs, drawing people in with attractive photos. It also conveyed information on outreach events, enlisting volunteers for the spring Green-Up and informing them of the event’s postponement due to rain. Followers of the page increased by 30 percent in 2016, to 729.

To further enhance the LVWCC’s presence on social media, data resource managers launched a Wash playlist on the SNWA YouTube channel, which has 378 subscribers and more than 500,000 views, increasing Wash project exposure and accessibility. The playlist contains a variety of Wash-related videos.

The Wash Team took panoramic photos at 61 points along the channel, documenting changes related to stabilization activities for the photo comparative analysis study. Aerial imagery was flown in spring and processed in summer.

Lastly, participating agencies added 73,908 lines of data to the water quality database.

2017 OPERATIONAL OBJECTIVES
The Wash Team will update and manage data resources and will continue to investigate avenues for increasing the LVWCC’s presence on social media. In addition, the platform used for the water quality database will be evaluated and upgraded if necessary.
mission
working to stabilize and enhance
the valuable environmental resources
of the Las Vegas Wash