CAMP action items

1. Install erosion control structures
2. Obtain topographic and geophysical data
3. Contact wastewater transport modeling
4. Establish off-channel wetlands with alternate discharge considerations
5. Establish stream channel detention/retention basins

DETERIORATION, administered by the Clean Water Coalition

6. Implement the development scope of service, alternate discharge study
7. Incorporate options and selection criteria (developed by the Alternative Discharge Study Team)
8. Follow the Alternative 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 the Environmental Review and Planning Study Team

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 land management positions
14. Develop educational materials for developers
15. Identify opportunities for emergency coordination efforts

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

16. Further investigate and design 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

FUNDS, 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 and its review funding options
24. Develop method to identify potential projects for grant funding
25. Utilize existing resources and staff, wherever possible

SHALLOW GROUNDWATER, co-ordinated 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 triennial report

WETLANDS PARK, administered by Clark County Parks and Recreation

34. Identify water resources needs to maintain this park
35. Develop long-term monitoring plans
36. Develop a long-term operations & maintenance plan
37. Ensure implementation of regulation 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 resources issues
43. Identify funding needs
44. Ensure interagency coordination to ensure projects are implemented

Please note that to the far left of each section's spread, a side bar contains a list of numbers which correspond with the CAMP action items listed here.
Dear Friends:

It has been yet another successful year for the Las Vegas Wash Coordination Committee. The commitment that began 12 years ago to stabilize and enhance the Las Vegas Wash continues. However, we must remember that our success relies heavily on our ability to work cooperatively to meet our common goals and objectives.

Nothing short of remarkable, the transformation of the Las Vegas Wash in recent years is a result of this cooperative effort. Protecting the quality of our community’s water resources and achieving regional water quality goals for the Las Vegas Valley watershed remains a top priority. The ongoing engineering activities to stabilize the Las Vegas Wash and minimize erosion will continue to play an important role in protecting our community’s drinking water supply and increase the sustainability of this vital waterway.

This 2010 Year-End Report summarizes activities conducted by the Las Vegas Wash Coordination Committee. Most notably, committee members received the U.S. Department of Interior’s Partners in Conservation Award. This is a true testament to the extraordinary collaboration of our efforts. The Las Vegas Wash Coordination Committee will continue to manage and implement action items from our guiding document, the Las Vegas Wash Comprehensive Adaptive Management Plan, necessary to stabilize and enhance the Las Vegas Wash.

Although substantial progress is now complete, we must continue to focus on the path ahead. There remains much work to be done and the partnerships among our stakeholders and between public agencies and the community we serve will help to bring it to fruition.

Sincerely,

Dennis Porter
Chairperson, Las Vegas Valley Watershed Advisory Committee

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
Clean Water Coalition
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
Neil Palazzo Award Committee
Northern Nevada Water District
Southern Nevada Water Authority
U.S. Army Corps of Engineers
U.S. Environmental 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
Clean Water Coalition
Las Vegas Valley Water District
Southern Nevada Water Authority

mission
Working to stabilize and enhance the valuable environmental resources of the Las Vegas Wash

background
The Las Vegas Wash (Wash) is the final link in the Las Vegas Valley’s water supply. It carries more than 185 million gallons of water a day. Decades ago, the natural drainage of the Wash created vast wetlands, spanning more than 2,000 acres. As population in Southern Nevada increased, so did the base flows. These flows, combined with periodic intense storm events, carved a deep channel through the sandy soil. Plants were swept away and the water supply was cut off to the surrounding wetlands. By the 1990s, less than 200 acres of wetlands remained and erosion along the banks threatened natural wildlife habitat, water quality and our regional storm- and wastewater infrastructure.

In 1998, the Las Vegas Wash Coordination Committee (LVWCC) was formed to restore the suffering waterway. The committee includes representatives from more than two dozen local, state and federal agencies, an environmental group, business owners and concerned citizens. The committee’s goal was twofold: Develop a long-term management plan for the Wash, and oversee implementation of the plan.

Within two years, the committee completed the Las Vegas Wash Comprehensive Adaptive Management Plan (CAMP)—a roadmap that includes 44 specific action items related to water quality, habitat management, erosion control and other key Wash-related issues. The LVWCC also created internal sub-committees and an advisory committee, the Las Vegas Wash Watershed Advisory Committee (LVWAC). The LVWAC fulfills its management authority through its members’ boards and councils.

This report is provided by the LVWAC and offers a close look at the progress of the CAMP action items, and the LVWCC’s accomplishments of 2010 and objectives for 2011.
EROSION AND STORMWATER

administered by the Desert Research Institute

12

Install erosion control structures

Twelve of the 22 planned erosion control structures (wet swale systems) have been installed along an approximately 6-mile section of the Wash (11 are permanent structures, and one, the Demonstration Wet Swale, is temporary and will be removed).

13

Obtain topography and geophysical data

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

14

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.

15

Establish off-channel wetlands with alternate discharge considerations

An off-stream wetland feasibility study was prepared and concluded that wetlands should be established within the active floodplain and not in surrounding upland areas.

16

Evaluate stormwater detention/retention basins

Clark County Regional Flood Control District 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.

17

ALTERNATE DISCHARGE

administered by the Clean Water Coalition (CWC), handled by CWC, action item

During the past decade, wastewater treatment has changed dramatically. In addition to the recent economic downturn, which has resulted in both decreased population projections and wastewater flows, the treatment capacity and technology have increased significantly. This has resulted in an ability to treat wastewater at higher levels and now the need to find an alternative discharge location. For these reasons, the region’s wastewater dischargers have elected to increase treatment levels rather than use off-channel wetlands and storm drain routing. The purpose of this item is to determine the need for the Clean Water Coalition, which will conclude its operations in June of 2011.

18

Provide updates to elected officials

Public outreach events are logged into Speakers Bureau Reports, which are then used to update elected officials and stakeholders.

19

FUNDING

administered by the Administrative Study Team

Further investigate potential funding sources identified by the team.

20

Obtain topography and geophysical data

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.

21

LAND USE

administered by the Environmental Review and Planning Study Team, handled by individual assigned agencies, action item

22

Further investigate and define strategy for long-term management of the Las Vegas Wash

Conduct sediment transport modeling to treat wastewater at higher levels and decreased population projections and wastewater flows, the treatment capacity and technology have increased significantly. This has resulted in an ability to treat wastewater at higher levels and now the need to find an alternative discharge location. For these reasons, the region’s wastewater dischargers have elected to increase treatment levels rather than use off-channel wetlands and storm drain routing. The purpose of this item is to determine the need for the Clean Water Coalition, which will conclude its operations in June of 2011.

23

Anticipate future funding needs

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

24

JURISDICTIONAL AND REGULATORY

administered by the LVWAC and the LWCC

Work with the Las Vegas Wash management entity to review funding options

25

Enforce interagency coordination

Budgets are reviewed and approved annually by the LVWAC. Operating expenditures not reimbursed by state, federal or private grants are paid for by the City of Henderson (4%), City of Las Vegas (15.4%), Clark County (10%), Clark County Regional Flood Control District (10%), Clark County Water Reclamation District (20.6%) and SNWA (40%). The LVWAC members agreed that the City of North Las Vegas will pay a prorated share of the budget when their wastewater treatment plant is fully operational. Capital expenditures not paid for by grants are paid for by a portion of the quarter-cent sales tax and associated loans.

26

Provide updates to elected officials

Develop a long-term monitoring program

Projects that could be funded by grants are vetted by the study teams and Wash Team. Assessment and prioritization criteria exist, but are not limited to, feasibility, cost, need for and importance of information and project merit.

27

Uplift existing resources and staff, whenever possible

Identify funding needs

Regular meetings are convened by managerial, technical and administrative staff to ensure that interagency coordination is achieved.

28

Develop a bibliography

A bibliography was completed and is accessible on the members’ section of lwwash.org.

29

WETLANDS PARK

administered by Clark County Parks and Recreation (Clark County), handled by Clark County, action item

Manage by outside agencies.

30

Promote interagency coordination

A bibliography was completed and is accessible on the members’ section of lwwash.org.

31

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.

32

Facilitate interagency coordination to ensure projects are implemented

Regular meetings are convened by managerial, technical and administrative staff to ensure interagency coordination is achieved. The Wash Team organized four meetings of the Research and Environmental Monitoring Study Team in 2010.

33

ENVIRONMENTAL RESOURCES

administered by the Desert Research Institute and Environmental Monitoring Study Team

Develop long-term management and monitoring programs

Long-term management and monitoring plans have been completed and updates and other activities are ongoing to achieve plan goals. Significant re-development of the long-term water quality monitoring plan was achieved and a revised plan is expected to be completed in early 2011.

34

Conduct additional research

Research activities are ongoing and are vetted by the study teams and the Wash Team.

35

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 completed to facilitate the presentation of cultural resources and is expected to be signed by all parties in 2011.

36

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.

37

Facilitate interagency coordination to ensure projects are implemented

Regular meetings are convened by managerial, technical and administrative staff to ensure interagency coordination is achieved. The Wash Team organized four meetings of the Research and Environmental Monitoring Study Team in 2010.

38

summary and evaluation of CAMP action items

The LWCC 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.
Las Vegas Wash 2010 Activities Maps

Bird Study Sites
- Aquatic Bird Count Weir Locations
- Aquatic Bird Count Off Channel Wetland Locations
- Southwestern Willow Flycatcher Survey Locations
- Marsh Bird Monitoring Locations

Invertebrate and Mammal Study Sites
- Large Mammal Locations
- Small Mammal Capture Locations
- Bat Live Capture Locations
- Nocturnal Invertebrate Collection Locations

Water Quality Monitoring Sites
- Mainstream Monitoring Sites
- Real-Time Water Quality Monitoring
- Total Suspended Solids Monitoring
- Tributary Sampling
- Dewatering Monitoring
- Tributary to Las Vegas Wash

General Legend
- Clark County Nature Preserve
- Clark County Wetlands Park
- Las Vegas Wash
- Lake Las Vegas
- Demonstration Wetland at the City of Henderson WRF
- Privately Owned (not a part of the Clark County Wetlands Park)

*Maps illustrate activities completed during 2010
PROJECT SUMMARY

As the population of the Las Vegas Valley grew, so did the discharge of highly-treated wastewater into the Las Vegas Wash. Increasing wastewater discharges and flood events led to increases in the erosion of the Wash’s channel beds and banks and a steady disappearance of wetland vegetation, which once covered the majority of the Wash floodplain. Three key efforts comprise the stabilization activities in the Wash: 1) Stop the channel bed from eroding deeper; 2) Protect the channel banks from erosion; and 3) Plant erosion-resistant, native vegetation on barren or eroding surface areas.

Twenty-two channel bed stabilization dams (weirs) are planned for installation along an approximately 6-mile section of the Wash channel. Weirs act as erosion control structures by slowing the stream flow and providing a stable platform for vegetation establishment. Twelve of these weirs are now fully operational (11 are permanent structures, and one, the Demonstration Weir, is temporary and will be replaced), with an additional two weirs scheduled for completion in mid-2011. Much of the project has been accomplished through the efforts of construction crews of Bureau of Reclamation (Bureau, usbr.gov), working in partnership with the LVWCC. In addition, the Federal Highway Administration has installed three weirs near Northshore Road, downstream of Lake Las Vegas, on National Park Service (nps.gov) lands. Currently, the Federal Highway Administration is planning for the installation of up to six additional weirs reaching all the way downstream to Lake Mead.

To date, stabilization efforts have resulted in the installation of more than 28,500 linear feet (7.3 miles) of bank protection along the Wash. The bank protection fortifies the shoreline and prevents further widening and soil loss. A key component in the bank stabilization effort has been the use of recycled concrete and rock rip-rap material, such as waste from casinos along the Las Vegas Strip that have been imploded or remodeled. At present, more than 240,000 cubic yards of recycled concrete has been repurposed as bank protection along the Wash.

2010 MAJOR ACCOMPLISHMENTS

In January, construction funded by $10.4 million in Southern Nevada Public Land Management Act (SNPLMA) grants began on the Lower Narrows and Homestead weirs. More than 60 percent of the construction of these two facilities was completed in 2010, with final completion scheduled for mid-2011. During 2010, the designs for the Demonstration Regulation Weir and the DU Wetlands No. 1 weir were completed and are now awaiting construction. By year’s end, design efforts were started on the Silver Bowl and Archery weirs.

In March, Bureau crews installed a temporary headcutting protection system downstream of the DU Wetlands No. 1 weir (weirs) are planned for installation along an approximately 6-mile section of the Wash channel). Weirs act as erosion control structures by slowing the stream flow and providing a stable platform for vegetation establishment. Twelve of these weirs are now fully operational (11 are permanent structures, and one, the Demonstration Weir, is temporary and will be replaced), with an additional two weirs scheduled for completion in mid-2011. Much of the project has been accomplished through the efforts of construction crews of Bureau of Reclamation (Bureau, usbr.gov), working in partnership with the LVWCC. In addition, the Federal Highway Administration has installed three weirs near Northshore Road, downstream of Lake Las Vegas, on National Park Service (nps.gov) lands. Currently, the Federal Highway Administration is planning for the installation of up to six additional weirs reaching all the way downstream to Lake Mead.

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bioassessment monitoring

2010 AT A GLANCE

- Implemented fourth round of bioassessment monitoring as a measure to minimize potential effects of stabilization activities to threatened and endangered species.
- Collected 19 bird egg samples from multiple sites in the Las Vegas Valley and simultaneously collected selenium samples.
- Collected the whole fish (common carp) in the Wash and 10 in Lake Mead and simultaneously collected selenium samples.
- Collected monthly zooplankton samples in Lake Mead (Las Vegas Bay and Overton Arm), which indicated minimal concern for selenium toxicity.
- Drafted a summary report for the third round of bioassessment monitoring and submitted report for technical review.

PROJECT SUMMARY

Erosion control structures along the Wash have led to some promising water quality improvements and ecosystem enhancements; however, these structures have the potential to change the flow regime. As the slowed waters pool behind the walls, there is concern contaminants may accumulate and affect both the water and area wildlife. Regular monitoring and oversight of biota helps to prevent potentially harmful contaminant accumulation in the waters and provides background data for future water and wildlife management decisions.

The bioassessment monitoring program tracks the impacts of the walls and monitors the potential for contaminants in the Wash. The objectives of bioassessment monitoring include determining the presence or absence of contaminants of concern in the Wash and select tributaries; comparing data results to established levels of concern; comparing data results to the same media among sample collection sites; and using the data for future bioassessment studies.

More than 300 samples of fish, bird eggs, water and sediment are typically collected biannually and then analyzed the following year for more than 50 contaminants of concern, such as selenium and mercury. The Pahranagat National Wildlife Refuge (Pahranagat) serves as a reference site where fish and bird egg samples are collected. Pahranagat has minimal urban influence found in its watershed, and samples from this area serve as a regional reference for baseline comparison.

In 2003, the Wash Team, aided by the U.S. Fish and Wildlife Service (fws.gov) and the U.S. Environmental Protection Agency (eapa.gov) certified laboratories to test a selected suite of contaminants of potential concern. The studies provide researchers with a snapshot of environmental conditions of the Wash and its tributaries, helping them to isolate issues of concern.

2010 MAJOR ACCOMPLISHMENTS

A draft report titled, "Las Vegas Wash Monitoring and Characterization Study Ecotone Potential Screening Assessment of Selected Contaminants of Potential Concern in Sediment, Whole Fish, Bird Eggs, and Water, 2007-2009," was submitted for technical review. The report was partially funded by the Bureau. The major findings are that the detected concentration of selenium, polychlorinated biphenyls (PCB's), copper, zinc, and mercury are of potential concern for toxicity to fish and wildlife at various sampling sites.

Bird eggs were collected in 2010 for bioassessment studies at Burns Street Channel and collected at Pahranagat and four killdeer eggs at Burns Street Channel. Water samples were analyzed for selenium for each bird egg collection.

Zooplankton sampling (dragging nets through the water at Lake Mead) in 2010. One of the recommendations from the 2007 bioassessment report was that analysis be limited to a single fish species, as opposed to using a variety of species as previously collected. The common carp was selected in that its lifestyle and diet most resemble the razorback sucker, an endangered fish found in Lake Mead. This round of collection was limited to two collection sites: the Wash (between Patricio Road Weir and Lake Las Vegas) and Lake Mead. Samples are collected monthly from two sites. With critical assistance of the City of Las Vegas (cityoflasvegas.com), Nevada Department of Wildlife (ndow.org), and zooplankton sampling began in 2010 and included in the selenium analysis. Zooplankton collections began in 2010 and will continue.

To date, data have shown that zooplankton are of minimal concern for selenium toxicity, as selenium concentrations are below the value found by some researchers to cause rapid mortality of razorback sucker larvae. 2011 OPERATIONAL OBJECTIVES

In 2011, the Wash Team will finalize the report for the third round of bioassessment monitoring, as well as submit bird egg and whole fish samples for analysis of contaminants of potential concern identified in previous rounds of the bioassessment program. Additionally, zooplankton collections will continue.

A second round of whole fish collections also will be completed in early 2011 as a winter collection to be compared against the fall collection to determine if there is any seasonal variance in potential contaminants in fish. This round of collections also will include the Wash and Lake Mead, but will add the Pahranagat site to serve as a control sample.
12.7 mg/L for 2010. This increase was due to various construction activities in and upstream of the Wash, which stirred up and released sediment downstream. Wetland systems formed behind weirs constructed in the Wash are very efficient in removing TSS from the Wash water. The TSS monitoring program was designed to determine the efficiency of these structures on the removal of suspended solids.

2010 MAJOR ACCOMPLISHMENTS

A program to monitor 15 groundwater wells along the Wash continued into 2010 to track changes in shallow groundwater quality during the construction of the remaining weirs. The wells were monitored monthly through April when they were decided, based on preliminary data that quarterly monitoring was sufficient. In August, this program was combined with other shallow groundwater monitoring conducted near Paquito Road to form one monitoring program.

Additional sampling along the Wash also was required in 2010 under two Nevada Division of Environmental Protection (NDEP) permits granted for the construction of the Lower Narrows and Homestead wells. Daily perchlorate samples were taken at the dewatering pipes while they were discharging to the Wash. Discharging took place from March through June and in December. During 2010, progress was made on uploading the water quality data from all the projects into a central database that can be accessed via the password-protected members’ website accessible at lvwash.org. This database allows all the members of the LVWCC to download the data from any of the water quality monitoring programs.

Data collected since 2000 shows that the overall water quality of the Wash improves with each year. This is because of the positive effects of bank stabilization and revegetation efforts are reflected in the water quality data. Total suspended solids (TSS) in the Wash have been reduced from an average of 103 mg/L in 2000 to 86 mg/L in 2008. This trend is expected to continue.

Results found that: aquatic invertebrates vary greatly among periods; the increased sedimentation rate is increasing the colonization rate of other species; and aquatic invertebrates were found at higher densities at these sites along the Wash that had improvements, compared to unimproved sites. Continuing this survey in the future will provide data on how the erosion control program and water quality changes are impacting the biota along the Wash.

12

PROJECT SUMMARY

Water quality monitoring provides a comprehensive understanding of the Wash flows and potential impacts on drinking water from Lake Mead, Permanent, real time water quality stations installed along the Wash and its tributaries continuously monitor water quality at various sites, including temperature, pH, electrical conductance and dissolved oxygen every 20 minutes.

The water quality monitoring efforts focused on the mainstream Wash are used to evaluate the baseline conditions of the Wash, to demonstrate water quality variations over time, to quantify the effects of increased wetland vegetation on water quality and to provide a long-term history of data that can be used to make watershed basis decisions. The tributary sampling program monitors the effects of urban runoff on the Wash, as well as meets stormwater discharge permit requirements. Samples taken from the tributaries provide important information on non-point sources of contamination to the Wash and Las Vegas Bay in Lake Mead. Data also are used in other applications of water quality monitoring, such as determining mass flux of contaminants and analyzing seasonal changes in water quality.

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The water quality monitoring efforts focused on the mainstream Wash are used to evaluate the baseline conditions of the Wash, to demonstrate water quality variations over time, to quantify the effects of increased wetland vegetation on water quality and to provide a long-term history of data that can be used to make watershed basis decisions. The tributary sampling program monitors the effects of urban runoff on the Wash, as well as meets stormwater discharge permit requirements. Samples taken from the tributaries provide important information on non-point sources of contamination to the Wash and Las Vegas Bay in Lake Mead. Data also are used in other applications of water quality monitoring, such as determining mass flux of contaminants and analyzing seasonal changes in water quality.

Data collected since 2000 shows that the overall water quality of the Wash improves with each year. This is because of the positive effects of bank stabilization and revegetation efforts are reflected in the water quality data. Total suspended solids (TSS) in the Wash have been reduced from an average of 103 mg/L in 2000 to 86 mg/L in 2008. This trend is expected to continue.

Results found that: aquatic invertebrates vary greatly among periods; the increased sedimentation rate is increasing the colonization rate of other species; and aquatic invertebrates were found at higher densities at these sites along the Wash that had improvements, compared to unimproved sites. Continuing this survey in the future will provide data on how the erosion control program and water quality changes are impacting the biota along the Wash.

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PROJECT SUMMARY

Wetland areas offer valuable benefits to the Wash by polishing flows and providing precious habitat for local wildlife. Wetlands are complex systems where biochemical processes play an important role in degradation of organic compounds and nutrient cycles. As a result, wetland systems can be beneficial in improving water quality by removing nutrients, contaminants and sediments. Past and current projects have offered scientists the chance to study these areas and conduct water quality, avian and vegetation monitoring activities. Two multi-year wetland demonstration projects have been completed: The Demonstration Wetland at the City of Henderson’s Kurt R. Segler Water Reclamation Facility (WRF) and the Pittman Wash Pilot Wetlands. Scientists studied the former from 2004-2009 to obtain data on the wetland’s ability to improve water quality of treated effluent and to identify compatible vegetation. The wetland was created in a pre-existing pond in the WRF and consisted of approximately 80 percent open water and 20 percent wetland vegetation (bulrush) and land surface area. Monitoring included water quality, vegetation and birds. The Pittman Wash Pilot Wetlands primarily examined the impact of wetlands on the water quality of urban runoff by diverting a portion of Pittman Wash into two bulrush-vegetated cells with different flow regimes. Scientists monitored water quality (2007-2009) and vegetation (2007-2008) to determine whether the wetlands were having an impact.

Within the Clark County Wetlands Park, the Nature Preserve and adjacent in-lieu fee mitigation wetlands provide an opportunity to study wetlands in both a mature wetland system and a developing wetland. The Nature Preserve was established in 2001 and has been monitored regularly since, while the in-lieu fee mitigation wetlands were only completed in June 2009. Eight sample locations within the Nature Preserve and in-lieu fee mitigation ponds are used to monitor for nutrients, metals and cation/anions. Four sites within the in-lieu fee mitigation ponds are sampled exclusively for selenium.

2010 MAJOR ACCOMPLISHMENTS

In February, in a continuation of work begun by the Harry Reid Center for Environmental Studies (HRC) at UNLV, the Wash Team began conducting monthly water quality monitoring at the Nature Preserve and the in-lieu fee mitigation wetlands. Ten months of consecutive water quality monitoring have been completed, providing the first long-term dataset for the in-lieu fee mitigation wetland ponds.

A grant was received from the Bureau to partially fund a study to evaluate the performance of wetlands along the Wash. A preliminary scope of work was developed. Analysis of data from the Pittman Wash Pilot Wetlands and Demonstration Wetland at the City of Henderson WRF began, and a draft report for the two projects was initiated. The Pittman Wash Pilot Wetlands were demolished (all plant material had been harvested and transplanted the prior fall) and cleared from the channel. The Desert Research Institute (DRI, dri.edu) completed the report, titled “A Comparison of Water Quality Improvements from Three Different Wetland Types in the Las Vegas Valley Watershed” in May 2010. The study found that plant nutrient uptake was related to water and sediment concentrations, and maximum water quality improvements would require the removal of plant roots. Also, bulrush were more efficient than cattails at removing arsenic and selenium. A version of the report was accepted for publication by the Environmental Monitoring and Assessment Journal, with an alternative title, “Removal of Nutrients and Metals by Constructed and Naturally Created Wetlands in the Las Vegas Valley, Nevada.” Also completed by the DRI was the report, titled “Nitrogen and Phosphorus Uptake by Cultured Microbes Collected from the Las Vegas Wash and Associated Areas.” The study documented several microbes within the Wash that take up nitrates and phosphate. To further improve water quality, microbes material removal must be considered as a management option. Without such removal, as is now the case, algae would ultimately die and decay, releasing the absorbed nutrients back to the Wash.

2011 OPERATIONAL OBJECTIVES

The HRC is currently working on a method to calculate flow within the in-lieu fee mitigation wetlands, which will help better understand the hydology of the system. Flow measurements will complement water quality sampling and help determine any reductions in analytes within the system. Also, in 2011, additional sampling locations may be placed within the in-lieu fee mitigation wetlands to characterize flow patterns within the wetland cells. Additionally, the Wash Team plans to implement a wetland performance study along the Wash by developing a system dynamics model. A water balance will be constructed as the first step, followed by the incorporation of data that have been collected from previous Wash studies or national studies.

2010 AT A GLANCE

- Began monthly water quality monitoring at the Nature Preserve and in-lieu fee mitigation wetlands; completed 10 months of consecutive monitoring.
- Received a grant from the Bureau to partially fund a study evaluating the performance of wetlands along the Wash.
- Initiated a draft report for the Pittman Wash Pilot Wetlands and the Demonstration Wetland at the City of Henderson WRF.
- Completed two reports, one comparing wetland sites within the in-lieu fee mitigation ponds and the other describing wetland sites and the other describing nutrient uptake by microbes. A portion of the former was accepted for publication by a peer-reviewed journal.
The divers and abundant wildlife at the Wash not only emphasizes the importance of the Wash area to Las Vegas residents, but also to the valley’s ecosystem. The Wash Team conducts long-term research and monitoring to expand the knowledge and understanding of all wildlife in the Wash. The information collected from their studies was used to develop the Las Vegas Wash Wildlife Management Plan. The plan serves as a guiding document to manage the Wash’s diverse wildlife population, and recommends 33 actions to conserve wildlife abundance and diversity, protect and enhance native wildlife habitats and increase environmental awareness of these resources in the community.

Since 1998, biologists have studied vertebrate and invertebrate wildlife inhabiting the Wash. They have since identified more than 260 vertebrate species through this research including: reptiles, large and small mammals (both terrestrial and aquatic), bats, fishes, amphibians and birds. Aquatic macroinvertebrates and terrestrial invertebrates, including butterflies, also have been documented. In addition, surveys for endangered bird species are conducted as a mitigation measure that allows erosion control activities to continue.

2010 MAJOR ACCOMPLISHMENTS
Progress continued in 2010 with the wildlife management plan. More than 85 percent of the recommended actions have now been implemented. The studies described below involve actions and sub-actions related to the plan’s objective of conserving the abundance and diversity of species that have been found along the Wash.

The Avian Point Count Study entered its sixth year.

A draft report from previous bat studies has also entered its sixth year. A draft of the report will be prepared for the Aquatic Bird Study and breeding season surveys will continue for the endangered southwestern willow flycatcher and Yuma clipper (via marsh bird monitoring). The Wash Team will finalize the 5-year bat study report on the acoustic and capture surveys, and the bat and nocturnal insect study report. The large mammal study will be completed in 2011. The acoustic and capture data and 2 years of capture data collected through 2009.

The Wash team conducted a bat and nocturnal insect survey to determine if revegetation efforts were improving the habitats of the Wash. Bats were captured at these different sites (tamarisk, riparian revegetation and passively-created wetland) using a triple high net (three mist nets stacked on top of each other). Seventy-one bats were captured and six species were identified. The two most frequently caught species were Yuma myotis and pallid bats. Bat calls were also recorded with Anabat 501 equipment and analyzed with Anabat software. Thirteen species were identified, with the two most recorded being the California myotis and Yuma myotis.

The Wash team conducted a study report on the acoustic and capture surveys, and the bat and nocturnal insect survey report. The large mammal study will be completed in 2011. The acoustic and capture survey report on the acoustic and capture surveys, and the bat and nocturnal insect survey report. The large mammal study will be completed in 2011. The acoustic and capture data and 2 years of capture data collected through 2009.
vegetation enhancement and management

2010 AT A GLANCE

- Revegetated just over 20 total acres at two sites.
- Cleared approximately seven acres of tamarisk near the Historic Lateral Weir.
- Began using drip irrigation on trees at revegetation sites to allow for more efficient watering.
- Finalized the 2009 Las Vegas Wash Vegetation Monitoring Report and the 2009 report to the U.S. Army Corps of Engineers and drafted the 2010 reports.
- Closed Army Corps of Engineers permits for Upper Diversion Weir and Powerline Crossing Weir.
- Eradicated all large infestations of tall whitetop along the Wash.

PROJECT SUMMARY

Stabilization activities limit erosion and reinforce the Wash’s banks, yet these efforts displace valuable vegetation in the process. When construction ends, the Wash Team and volunteers replant disturbed sites with suitable native vegetation. These actions comply with the 404 permits issued by the U.S. Army Corps of Engineers (Corps, usace.army.mil) and stormwater permits issued by NDEP. This work also allows for habitat enhancement, public outreach and bank stabilization benefits.

The health of the vegetation and variety of plant life are important in controlling the animal species that will reside in an area. Plant life also helps control erosion by stabilizing soils, shores and adjacent banks. The Wash Team diligently works to clear invasive vegetation such as rapidly spreading tamarisk, which increases soil salinity and can degrade habitat quality, and replants these areas with diverse native vegetation. Both new and previously existing revegetation efforts continue to be successful along the Wash. Annual monitoring shows that even sites that are 10 years old are still growing and that these mature sites are a seed source for the system. Germination from older sites is helping newer sites become established faster.

Through research and testing, the Wash Team has created a growing list of native plants for the Wash. A wide variety of native plant material and planting techniques for revegetation projects have been utilized, including a seed collection program and hydroseeding techniques. In addition, ideal irrigation practices have been explored and developed to ensure that every area laboriously planted thrives and meets the performance criteria outlined in permits.

To date, the Wash Team has revegetated almost 280 acres of Wash land. Of the completed acres, this includes 69 acres of wetlands, some of which are used to meet Corps permit requirements. All of the non-wetland acres, as well as the remaining wetland acres, are used to meet requirements for other permits or grants provided to the SWWA.

Since 2001, vegetation management activities have consisted of finding innovative and economical ways of removing non-native species from the Wash and ensuring that these species do not return to revegetated sites. Effective invasive weed control helps improve wildlife habitat and allows native plants to thrive. To date, approximately 1,290 acres of tamarisk have been removed from the Clark County Wetlands Park and surrounding areas.

2010 MAJOR ACCOMPLISHMENTS

Revegetation areas in 2010 were selected and implemented using criteria laid out in the Las Vegas Wash Revegetation Master Plan. The master plan also describes the maintenance and monitoring activities generally required on revegetation sites along the Wash to ensure that they are eventually self-sustaining. Just over 20 total acres of the Wash was revegetated in 2010. This included 5.9 non-wetland acres planted at DU Wetlands No. 2 Weir during the spring Green-Up, an additional 0.7 wetland acres at the same site, as well as 13.8 non-wetland acres near Historic Lateral Weir planted during the fall Green-Up. The fall Green-Up area had approximately seven acres of tamarisk cleared by Bureau crews in the spring specifically for this volunteer planting event. The area surrounds a site planted in the spring of 2008.

Also, in 2010, the Wash Team began using drip irrigation on trees at revegetation sites, which allows for deeper watering, as well as watering more efficiently without excess water use across the entire site.

The 2009 Vegetation Monitoring Report, which documents the status of all revegetation sites planted through 2009, was completed, as well as reports to the Corps, which closed out permits for the Upper Diversion Weir and Powerline Crossing Weir. In addition, the 2010 reports were drafted.

Contractor crews sprayed herbicide on tall whitetop within all revegetation sites during the fall and spring Green-Ups. In the fall, areas near the Lower Narrows and Homestead Weirs are expected to be planted. Revegetation sites will continue to be monitored to gauge the success of the program.

Additionally, invasive weed management will continue by reducing new infestations of tall whitetop and removing approximately 10 acres of tamarisk downstream of the Pabco Road Weir in preparation for the spring Green-Up.
PROJECT SUMMARY

The Wash has attracted visitors to its banks since as early as 300 B.C. Valuable information about the lifestyle of Las Vegas’ earliest inhabitants lies buried beneath the soil, waiting to reveal the story of a people who long ago used the area’s water, plant and animal resources to sustain a life in the harsh Mojave Desert. The Wash Team and archaeologists work to identify potential cultural resource sites and excavate noteworthy areas if needed to ensure that historically significant artifacts are appropriately collected and catalogued. As one of the most significant concentrations of cultural resources in the area, the Wash contains a number of cultural resource sites that provide significant data about the historic and prehistoric desert culture in Southern Nevada. In 1977, the area was designated as the Las Vegas Wash Archaeological District in an effort to recognize and protect these resources. Also, any feature more than 50 years old discovered in the area may be eligible for listing on the National Register of Historic Places. To date, more than 40 eligible sites have been identified at the Wash. Almost 10 years ago, the Bureau partnered with the Wash Team to conduct archaeological surveys as a step toward preserving the historically significant area. Today, the Wash Team works to preserve this area and mitigate for impacts from construction-related disturbances.

Archaeological excavations of buried cultural deposits at the Wash have identified pit houses, hearths and food storage pits dating from 300 B.C. to A.D. 1600. These digs have allowed researchers to study artifacts corresponding to different periods of occupation. Archaeological discovery of the foundation of a milk house with an irrigation ditch, a collapsed 4-foot timber wall and a stepping-stone pathway dating from the early 1900s suggest that the Wash was a central lifeline for early inhabitants and explorers of Southern Nevada.

2010 MAJOR ACCOMPLISHMENTS

Although the milk house project associated with the Lower Narrows weir was excavated in 2008, the analysis of the abundance of artifacts that were procured from the site was completed in 2010. The compiled evidence supports the idea that the establishment was dated to the early 1900s and was part of the Bishop Ranch operation. It likely belonged to one of the Bishop brothers and his family, given that the collected artifacts included broaches and children’s toys. A draft report of this project is being prepared and is near completion.

The milk house structure was disassembled and relocated to the Clark County Museum in 2009. Using partial funding from the Bureau, the Wash Team is currently working with Clark County officials, archaeologists and an engineering firm that specializes in historic properties to put together the design of the reassembly site. Analysis of another site associated with the future Sunrise Mountain weir project also was completed in 2010. The site featured a bell-shaped storage pit and thermal pit. A draft report on the results of this project is under review.

A third area of potential historic resource significance also was tested this year in association with the future Silver Bowl weir construction. Given the geographic properties of the area, archaeologists felt that the area could potentially be as active as the Larder and Scorpion Knoll sites from several years ago that produced hundreds of storage pits, other signs of habitation and even agriculture. After testing the area further, no evidence was found from the historic or prehistoric time period, hopefully eliminating any potential delays for the future construction.

2011 OPERATIONAL OBJECTIVES

The most significant accomplishment for the upcoming year will be the signature and execution of a Programmatic Agreement for the Clark County Wetlands Park between the Bureau, the Corps, the SNWA, the Nevada State Historic Preservation Office and the Advisory Council on Historic Preservation. The execution of this document in 2010 was delayed due to personnel changes within the Bureau, but the document has been finalized and was presented to the SNWA Board of Directors for signature in February. The Wash Team also will be busy in 2011 with completing the reassembly of the Lower Narrows milk house at the Clark County Museum, where it will serve as an educational resource. Reports from the excavations near Sunrise Mountain and Silver Bowl weirs are also expected to be finalized in 2011.

Glass fragments dated more than 50 years old are catalogued near future Sunrise Mountain Weir construction, finding no evidence of significance.
**PROJECT SUMMARY**

The Wash plays a critical role in our community’s overall ecosystem. As the public’s awareness grows, so does their involvement in events at the Wash. Activities offer the community a chance to participate in and understand the unique challenges facing the Wash and challenge citizens, from children to adults, to become involved in preserving this vital waterway. Since the first volunteer event in 2001, more than 6,000 people have volunteered to lend a hand in planting more than 53,000 trees, shrubs and emergent grasses that now beautify and strengthen the Wash area. The 17 volunteer Green-Ups completed to date include the largest one-day volunteer planting event in Nevada history and have revegetated more than 137 acres with native plants. The Wash Team dedicates resources and staff time into providing learning opportunities and educating Southern Nevadans about the importance of the Wash and its water quality, plant and animal species, stabilization activities and archaeological discoveries. The team also attends annual earth fairs and community events across the valley, displaying a booth staffed with knowledgeable personnel. The Summertime Earth Fair, St. Rose Earth Day, UNLV Earth Day and Alternative Energy Fair are examples of the many events where staff have seized the opportunity to answer questions and increase public awareness and understanding in the community. Since the first community outreach events in 2000, the Wash Team has interacted with nearly 183,000 people. Each month, the Wash Team creates an informative e-newsletter (referred to as the Email Update) to keep the community and stakeholders abreast of activities and accomplishments. Last year, 4,320 E-mail Updates were sent out across the valley. Also, the SNWA’s annual WaterSmart calendar, funded in part by a grant from the NDEP, incorporates tips on protecting the local watershed and reducing nonpoint source pollution and is mailed to all valley single-family owner-occupied homes.

**2010 MAJOR ACCOMPLISHMENTS**

In 2010, progress began on an outreach plan to further engage community interest and participation during activities in which staff disseminate messages regarding the Wash. An area of focus was effective monitoring, which primarily consisted of the development of surveys to give to participants before information is presented and after it is received to see how well the information is being relayed and understood. The partnership with Mabel Hoggard Math and Science Magnet School (since 1998) continued to progress in 2010. The partnership offers students the chance to team up with Wash biologists and hydrologists to become scientists for a day. The Wash Team adapted the field trip experience to include a wastewater treatment tour at the City of Henderson WWF.

Additionally, approximately 50 plants were grown at Mabel Hoggard’s greenhouse and then planted at the Wash. Also in 2010, the Wash Team completed and published the Invasive Weed Field Guide, which identified approximately 30 species of noxious weeds to help LVWCC partners and users of the Wetlands Park identify and report invasive weeds to the Wash Team. The guide also identifies other potential weed species that may be detected in the future. Two Green-Ups were conducted during 2010, one in spring and one in fall. The spring event was located on the south side of the Wash adjacent to the DU Wetlands No. 2 Weir. Three-hundred volunteers planted more than five acres with approximately 2,000 trees and shrubs. The fall Green-Up was on the south side of the Wash at the Upstream Historic Lateral South 2 Upper Plateau site, where 443 volunteers planted approximately 5,000 trees and shrubs on nearly 14 acres. Two informative kiosks were installed at the Upper Diversion Bridge on the north and south banks to educate visitors about water pollution prevention and the Wash. The kiosks were funded by a grant from NDEP.

The membership process to join Connecting Hands Offering Lifelong Learning Adventures (CHOLLA) was completed in 2010. CHOLLA is a consortium of community agencies and the Clark County School District that collaborate to provide opportunities for connecting and extending classroom learning. The Wash Team reached more than 13,000 people at 32 community outreach events in 2010 and hosted a total of 19 meetings including the LVWAC, LVWCC and Research and Environmental Monitoring, Administrative and Operations study teams.

The Wash Team also recorded the oral history of Norma Cox, a founding member of the Desert Wetlands Conservancy.

**2011 OPERATIONAL OBJECTIVES**

In 2011, staff will complete and implement the outreach plan, including effectiveness monitoring. Two Green-Ups will be conducted during 2011, one in spring and one in fall. The Wash Team also plans to participate in or coordinate outreach events for the community including several Earth Day-type events and the Mabel Hoggard program. In 2011, the Wash Team also will host the first World Wetlands Day event in Nevada at the Wetlands Park.
2010 AT A GLANCE

- Initiated significant update to streamline the members’ website.
- Hosted more than 25,000 visits and more than 28,000 unique visitors at lvwash.org.
- Responded to 127 information requests.
- Processed new digital aerial photography and imagery from two flights.
- Incorporated 426,452 lines of water quality sample data into centralized database.

PROJECT SUMMARY

The Wash Team diligently creates, monitors and maintains a variety of technology-driven projects to support the ongoing research and activity of the LVWCC. From water quality to bioassessment monitoring, the ability to store, access and share data for stakeholders and the public to access and request information from the LVWCC and the Wash Team. Two websites were established to support the LWCCC’s efforts. The password-protected members’ site accessible via lvwash.org helps facilitate communication among the study teams, LVWCC members and the Wash Team. This site includes several applications such as: Project Tracking, the Image Repository, a Water Quality Database and the Contact Request System. The Wash’s public website, lvwash.org, provides instantaneous information to the community. Designed to inform and energize the public about the LVWCC’s efforts, the website features monthly articles and information about upcoming Wash events and provides a multi-faceted look at the Wash’s past, present and future. Users can volunteer and request tours or field trips through the site.

Continued maintenance on the sites includes: monthly news updates, E-mail Updates and regular updates to both the public website and the members’ website. The Wash Team also provides the ever expanding storage, maintenance and processing of high-resolution aerial photographs, which are flown a minimum of every six months. These photographs provide the baseline maps for researchers to use for vegetation analysis, planning, erosion control, water quality and overall documentation of historical changes.

2010 MAJOR ACCOMPLISHMENTS

In 2010, a significant update to the members’ website was initiated to streamline the site by removing unused functionality, updating the underlying technology with current standards and increasing overall site usability. The goal was to reduce duplication of effort and increase the efficiency of maintaining the site and its information. With these changes, an increase in usage is expected from partners. In addition to its other benefits, the members’ website offers a vast amount of information each year. In 2010, there were 426,452 lines of water quality sample data taken in 2010. The flights take place as requested by researchers, or when needs arise. There were 426,452 lines of water quality sample data drawn in 2010. Since the inception of the program in 2008, a total of 2.8 million lines of water quality sample data have been drawn. The centralized database now includes 250 sites, 623 parameters and 15,348 data points.

Information on all meetings related to the Wash, including agendas, summaries, presentations, upcoming community events, educational events and tours. The site also is a great tool to find any involved agencies and their representatives.

An active year for the Wash Team resulted in more than 127 information requests from partners. In addition to its other benefits, the members’ website offers a vast amount of information each year. In 2010, there were 426,452 lines of water quality sample data taken in 2010. The flights take place as requested by researchers, or when needs arise. There were 426,452 lines of water quality sample data drawn in 2010. Since the inception of the program in 2008, a total of 2.8 million lines of water quality sample data have been drawn. The centralized database now includes 250 sites, 623 parameters and 15,348 data points.

2011 OPERATIONAL OBJECTIVES

The most significant objective for 2011 is the implementation of the fully updated and enhanced members’ website. Other projects will include regular content maintenance of lvwash.org. The Wash Team will continue to look for opportunities to improve the website and keep up with industry standards, ensuring timely, concise and relevant applications, databases and repositories. Ongoing research, updates and monthly news articles also will continue. The water quality database will grow as agencies continue to add data. New digital aerial photography will be taken, processed, and stored and new baseline maps will be created. Because interagency coordination is so critical to long-term management activities of the Wash, the Wash Team will continue to liaison with information technology professionals to facilitate the efficient and accurate transfer of information among participating agencies.
lvwash.org

Mission: working to stabilize and enhance the valuable environmental resources of the Las Vegas Wash

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