

Las Vegas Wash Coordination Committee



2005 Year-End Report



Dear Friend:

The past year has been a very productive one for the Las Vegas Wash Coordination Committee (LVWCC). When this committee was created seven years ago, its members and the entities they represented committed themselves to a common goal—managing and enhancing the Las Vegas Wash.

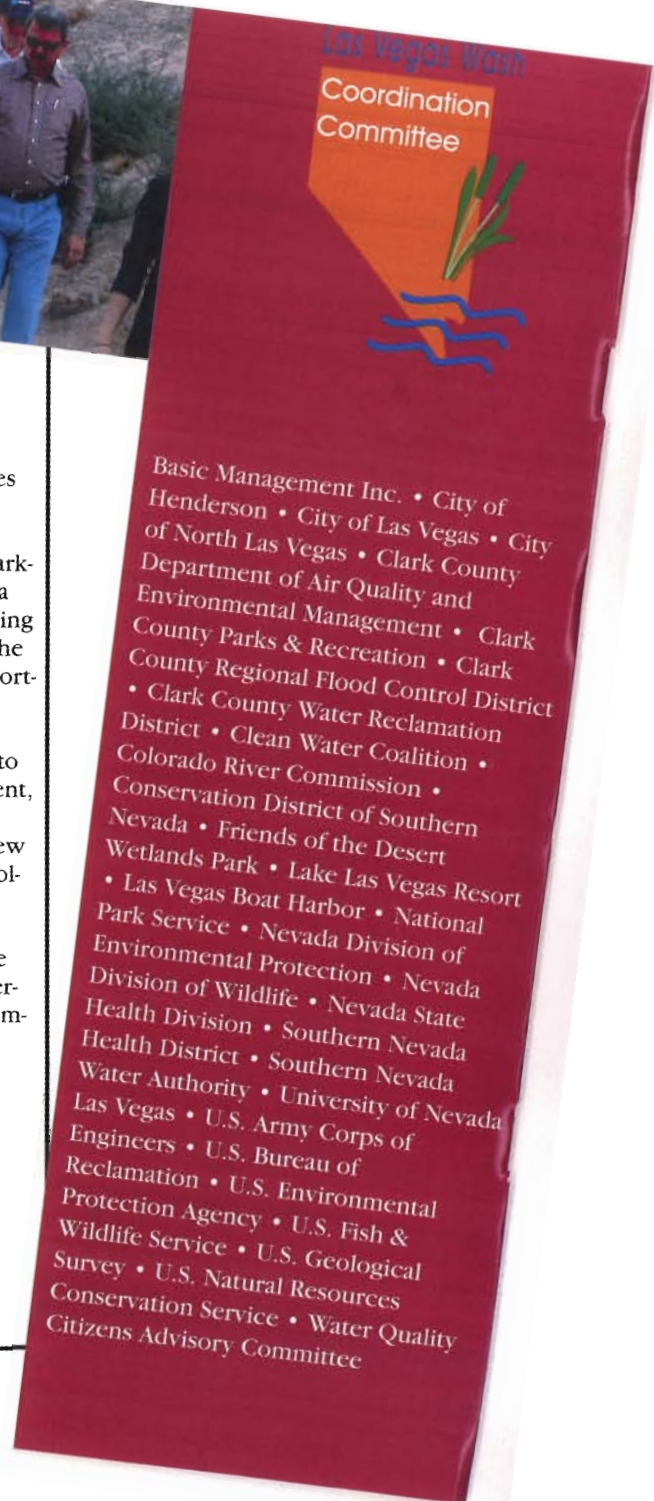
The Wash's transformation during recent years has been nothing short of remarkable. Although much work remains, an environmental resource that less than a decade ago was in great peril grows stronger and more diverse with each passing day. Erosion control structures and bank stabilization activities have fortified the Wash's defenses, while revegetation activities have increased habitat and supported stabilization projects.

Research studies related to the ecosystem's health and water quality continue to increase the body of knowledge about the interactive nature of our environment, informing decision-makers as they strive for improved sustainability. Exciting archaeological work has shed light on ancient visitors to this timeless oasis. New and continuing wetland demonstration projects explore the potential water-pollishing benefits of wetland vegetation in urban settings.

As we look forward to another exciting year in 2006, it is important not to lose sight of how far we have come. The LVWCC represents the potential of partnerships—those among various stakeholders, and between government and the community it serves. It is tremendously fulfilling to see that potential come to fruition.

Sincerely,

Gale Wm. Fraser, II
Chairman, Management Advisory Committee
Las Vegas Wash Coordination Committee



Background

In 2002, the local agencies comprising the LVWCC Management Advisory Committee (MAC) entered into a Cooperative Agreement for the long-term management of the Las Vegas Wash (Wash). This report is the fourth produced in accordance with Section 1.4 of that agreement.

These Year-End Reports are designed to provide stakeholders a thorough description of all activities related to the Wash, the Action Items identified in the Las Vegas Wash Comprehensive Adaptive Management Plan (CAMP) and the management of the resource since the initiation of the project.

This document builds upon the foundation established in previous years, with a focus upon activities conducted during 2005. The report is intended to apprise stakeholders of activities initiated, continued or completed during the past calendar year. Additionally, it is intended to underscore the linkage between these activities and the 27 Action Items defined in the CAMP for which the MAC is responsible. Each section in this document will include the specific relevant CAMP Action Item(s), a summary of activities during calendar year 2005 and goals for calendar year 2006. Of the actions

identified as the responsibility of the MAC, 13 are complete and 14 are ongoing.

The operating budget for activities associated with the Wash during the 2005/2006 fiscal year was \$2,610,624, with participant agencies contributing \$1,790,624 and federal agencies contributing \$820,000. This figure does not reflect additional monies acquired through grants and additional federal contributions that totaled more than \$33 million for Wash-related projects. The capital budget for fiscal year 2005/2006 was \$21,328,914.

MAC MEMBERS

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
Southern Nevada Water Authority



Stabilization

Chapter: 1

Action Items: 1-3, 21-25,
32, 41, 43, 44

FOR ACTION ITEMS LISTING,
SEE PAGES 3-4



RELEVANCE TO CAMP

Installing erosion control structures, obtaining topography and geophysical data, and conducting sediment transport modeling are all crucial activities required to stabilize the Wash (See map on pages 15-16).

Prior to implementation of stabilization activities, flood flows, wastewater discharge and urban runoff were causing the Wash to erode and discharge sediment into Lake Mead at ever-increasing rates.

In prioritizing the recommendations presented in the CAMP, the LVWCC recognized that stabilization of the Wash and a reversal of current erosion trends is necessary in order for many of the other recommendations in the CAMP to be successful.

OVERVIEW

With oversight by the Operations Study Team, efforts to plan, design, finance, construct, and operate stabilization facilities in the Wash are addressing numerous issues and challenges. Major considerations include: Flow capacity; sediment control; facility stability; water quality protection; ecosystem enhancement; recreational benefit; public safety; permitting requirements; land use; facility costs; maintenance costs; constructability; ownership; operational characteristics and other key issues. The majority of funding for installation of stabilization facilities is provided by locally generated sales tax revenues. The Wash receives 4 percent of the 1/4-cent sales tax revenues set aside for water and wastewater projects in Clark County. These revenues are augmented by state and federal agency grants as well as direct federal funding.

PROGRESS SINCE INCEPTION

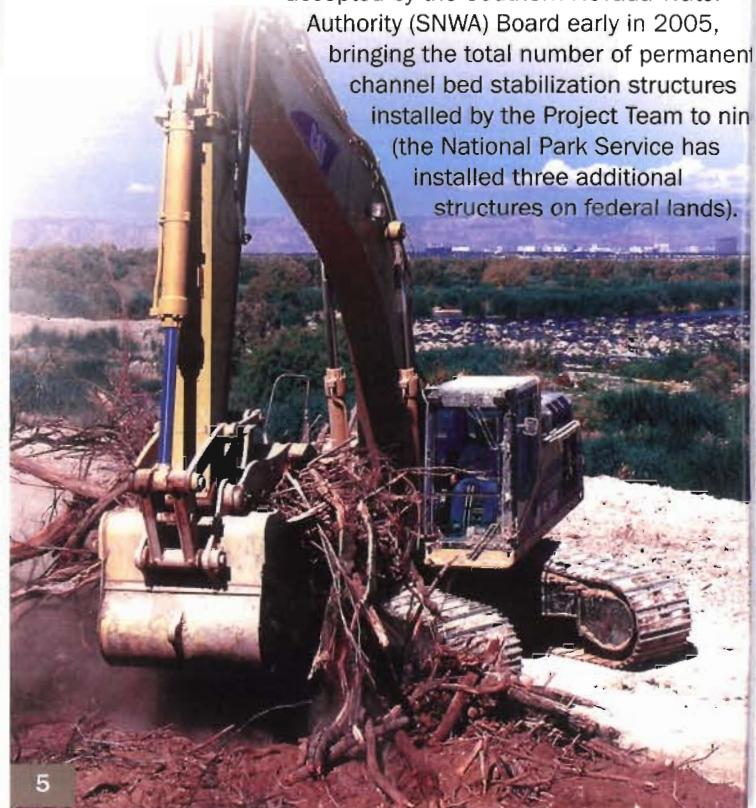
During the past six years, eight permanent and one temporary channel bed stabilization weirs—small dams designed to slow flows and reduce erosion of the Wash channel bed—have been constructed. The National Park Service has installed three additional weirs on federal lands.

The structures have reduced total suspended solids (TSS) in the Wash by more than 60 percent, stabilized the channel and fortified the Wash against significant rain events.

Additionally, approximately 25,000 lineal feet of the Wash's bankline has been reinforced for channel bank protection to reduce scouring of the sandy soil and maintain the integrity of the weirs. Revegetation of disturbed areas associated with construction activities, which is addressed fully in the Vegetation Enhancement and Management section of this document, also has contributed to the decline of TSS.

2005 MAJOR ACCOMPLISHMENTS

The Calico Ridge Weir was completed and accepted by the Southern Nevada Water Authority (SNWA) Board early in 2005, bringing the total number of permanent channel bed stabilization structures installed by the Project Team to nine (the National Park Service has installed three additional structures on federal lands).



The Demonstration Weir was reinforced, while construction of the Powerline Crossing Weir began in December 2005. Design of the Upper Diversion Weir, scheduled for construction in 2006, is nearly complete, as is design work for the Ducks Unlimited No. 1 and Ducks Unlimited No. 2 weirs.

During 2005, geotechnical investigations were completed for the Lower Narrows, Homestead, Ducks Unlimited No. 1 and Ducks Unlimited No. 2 weirs. Geotechnical work on the Archery, Silver Bowl, Duck Creek Confluence and Upper Narrows weirs is nearing completion.

An additional 4,400 lineal feet of bank protection was completed in 2005, bringing the total since 1999 to approximately 25,000 lineal feet. To support both bank protection and channel bed stabilization activities, the Project Team acquired and transported 34,000 cubic yards of riprap and other material to the Wash.

The Project Team is also supporting member agencies' initiatives through ongoing coordination, providing engineering support to Clark County and the City of Henderson.

Specifically, the Project Team assisted Clark County with determining the bridge type and configuration at Powerline Crossing Weir and Upper Diversion Weir, while helping the county and the City of Henderson determine channel crossing configuration at the C-1 Channel. The Project Team is also assisting Clark County with the

The SNWA has forged a partnership with the U.S. Bureau of Reclamation (Bureau) to perform yearly maintenance and construction in the wetlands area. Here, the 2005 crew takes a break from their hectic schedule before deploying on their next task.

design and location of trailheads and the trails system within the Clark County Wetlands Park (Wetlands Park).

The 2006 Capital Improvements Plan was developed and approved by the SNWA Board of Directors, while the Operations and Maintenance Plan was updated and presented to the MAC for consideration.



Bank stabilization is an important element to help deter erosion in the Wash. During 2005, an additional 4,400 lineal feet of bank protection was completed.

2006 OPERATIONAL OBJECTIVES

The next year promises to be an exceptionally busy one from a stabilization perspective, with several projects scheduled for construction during 2006. The Powerline Crossing Weir, on which construction began in December 2005, is slated for completion this year. Construction will also begin for the Upper Diversion Weir and Outfall Channel, the Ducks Unlimited No. 1 Weir, and the Ducks Unlimited No. 2 Weir.

A request for proposals to design the Lower Narrows, Homestead, Duck Creek Confluence and Upper Narrows weirs is scheduled for issuance in early 2006. Additionally, the installation of another 5,300 lineal feet of bank protection is planned for 2006, which will bring the total to more than 30,000 lineal feet since inception.

A 13-month hydraulic modeling project related to the Demonstration Replacement Weir is scheduled to begin in February 2006. Environmental permitting is also under way for a site identified as a potential long-term excess soils storage area.

Bioassessment Monitoring

Chapter: 2

Action Items: 1, 4, 21-25
28, 32, 41, 43, 44

FOR ACTION ITEMS LISTING,
SEE PAGES 3-4



RELEVANCE TO CAMP

A bioassessment monitoring plan that addresses concerns identified by the U.S. Fish and Wildlife Service (USFWS) during consultation on the Razorback Sucker for construction of erosion control structures in the Wash was initiated in 2003 and repeat-

ed in 2005 to validate the original results.

PROGRESS SINCE INCEPTION

Sample collection and analysis associated with the bioassessment monitoring plan is ongoing.

Collection activities for 2005 associated with water, bird eggs and fish tissue have been completed; sediment collection activities continue. Water quality analyses are complete, while bird egg and fish tissue samples are being forwarded for analysis. The monitoring program involved water quality analysis from monthly sampling at eight locations along the Wash, along with sediment, bird egg and fish tissue analyses from three locations in the Wash, one location in Duck Creek, one location in the Nature Preserve and a one-time sampling event in Las Vegas Bay. Additionally, bird eggs and fish tissue from the Pahrnagat National Wildlife Refuge were analyzed to provide regional reference data.



Tracking fish measurements, such as with this black bullhead, is one component of tissue sampling.

OVERVIEW

Erosion control structures along the Wash have led to some promising water quality improvements. For example, TSS, a key barometer of erosion, has been reduced by more than 60 percent. However, these structures have the potential to change the flow regime of the Wash by creating ponds behind them and slowing the flow. A concern related to these physical changes is the potential for contaminant accumulation behind erosion control structures, which serve as potential habitat for fish and wildlife. For example, some naturally occurring contaminants (i.e. selenium) have the potential to accumulate. A stakeholder group was convened to develop a bioassessment monitoring plan to address the questions related to these concerns. There are four components to the plan, implemented under the technical oversight of the Research and Environmental Monitoring Study Team: water quality monitoring, sediment monitoring, fish tissue analysis and bird egg analysis.

The concentration of parameters detected in samples collected from the Wash will be compared to levels of concern established by the USFWS and the U.S. Environmental Protection Agency (USEPA). The results of this comparative analysis will be used to identify specific geographical areas of potential concern for contaminants, assess the statistical validity of the data collection procedures and develop recommendations to characterize and mitigate exposure to contaminants.

A mother killdeer protects her eggs at the Wash.





Studying bird eggs such as these is a key factor to determining the health of the environment.

2005 MAJOR ACCOMPLISHMENTS

The Bioassessment Fish Study was repeated in 2005 and additional fish were collected for comparative analyses with 2003 data. Sampling sites included the Wash, Duck Creek, the Nature Preserve, Las Vegas Bay and the Pahrangat National Wildlife Refuge, which was used as a regional reference site. The three species collected were common carp (*Cyprinus carpio*), black bullhead (*Ameiurus melas*) and green sunfish (*Lepomis cyanellus*).

The Project Team and USFWS completed collection of bird eggs from the same locations as previous monitoring for comparative analysis. A contract was also developed with the Desert Research Institute to collect sediment and water quality samples.

The final 2003 report is being reviewed by a nationally recognized toxicologist.



A marsh wren nest yields eggs for analysis—penny for scale.

2006 OPERATIONAL OBJECTIVES

The primary focus related to bioassessment monitoring during 2006 will be the analysis of bird eggs and fish tissue. Completing sediment collection and analysis will also be a priority. After that phase is completed, the data will be forwarded to a toxicologist for review and report development.

The final report associated with data collected in 2003 is scheduled for completion in 2006 as well, providing baseline information from which future changes may be compared.

Water Quality

Chapter: 3

ACTION ITEMS: 4, 21-29,
32, 33, 41, 43, 44

**FOR ACTION ITEMS LISTING,
SEE PAGES 3-4**



RELEVANCE TO CAMP

Water quality monitoring and data collection from the Wash and tributaries, Lake Mead, and shallow groundwater seeps support the goals of the Research and Environmental Monitoring Study Team.

Limnological investigations designed to inform technical staff and decision-makers responsible for planning, designing and executing environmental analyses continue and have been expanded. This data is also relevant to both the Clean Water Coalition (CWC) SCOP project and the SNWA's Intake No. 3 project. The SCOP project is a program that examines managing effluent generated in the Las Vegas Valley by changing the discharge point for highly treated wastewater from the Wash to Lake Mead. Because of lowering lake elevations due to the drought, SNWA's intake No. 3 project will create a drinking water intake at an elevation of 860 feet, more than 100 feet lower than the lowest existing intake. Intake No. 3 will be located close to Black Island. Additionally, data is useful for quantifying and monitoring the fate of certain constituents found in groundwater and surface water, providing information about their relationship with the community's water supply.

groundwater seep located near the Wash for field parameters, major ions, metals, nutrients, organics, selenium, mercury and perchlorate. Flow data in tributaries is collected monthly. Shallow groundwater monitoring at six shallow groundwater wells is conducted near the Pabco Road Erosion Control Structure for several field parameters. TSS samples are taken monthly at seven locations in the Wash.

Real-time water quality monitoring occurs at two locations in the Wash and in three tributaries to the Wash. Although not directly



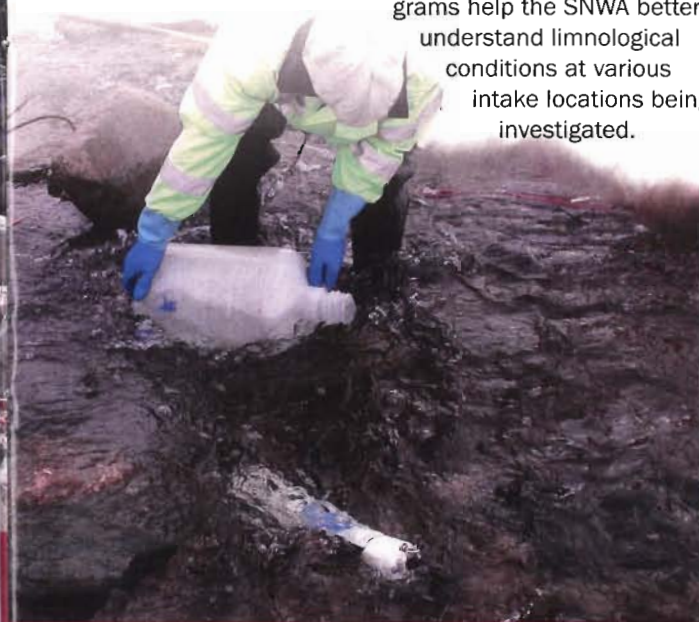
OVERVIEW

Water quality monitoring is conducted monthly at eight locations in the Wash for field parameters, major ions, metals, nutrients, bacteria and perchlorate. Quarterly monitoring is conducted at six Wash tributaries and one shallow

Water quality scientists conduct tests at the Wash. More than 122 different tests are routinely conducted in the Wash and its tributaries as part of the LVWCC's water quality monitoring program.

associated with the Wash projects, another initiative that provides valuable data is the Lake Mead and Boulder Basin monitoring program. Limnological field data from Boulder Basin are collected weekly from seven key or "posthole" locations. The weekly series provide a comprehensive look at the profile from surface to reservoir bottom using many physical, chemical and biological parameters. Additionally, a monthly survey of 24 locations in Boulder Basin is conducted measuring key parameters in a profile and the collection of perchlorate samples. A third module to this survey is collection of physical and chemical data from samples collected monthly from all of the major sources of water to Lake Mead and the outflow at Hoover Dam. These data are analyzed, reduced and interpreted. Visual product results provided in a timely manner are viewed and used by decision-makers. Additionally, mathematical modelers of Boulder Basin use these data to provide vital information to the CWC SCOP efforts.

These studies are also important for the SNWA's site selection analysis for the new drinking water intake. The deeper intake will enhance water quality by locating the pipe further away from bacteria and micro-organisms that are more prevalent on the lake's surface. Data generated from the monitoring programs help the SNWA better understand limnological conditions at various intake locations being investigated.



Technology alone cannot sample water quality. A team of dedicated scientists regularly visit the Wash to take water samples for further analyses.



An important element of water sampling is to sample from not only surface areas, but also deeper waters.

PROGRESS SINCE INCEPTION

Sample collection and analyses associated with the water quality monitoring plans are complete. The program involved analysis of monthly samples from eight locations along the Wash. Additionally, samples were drawn from six shallow groundwater wells near the Pabco Road Erosion Control Structure, and seven locations in the Wash for TSS. Quarterly samples were taken from six tributaries and one shallow groundwater seep. Real-time water quality monitoring continues in the Wash and its tributaries.

Four years of limnological data collected from Boulder Basin were summarized in the report "Limnological Status of Boulder Basin, Lake Mead, Nevada-Arizona, 2000-2004." Data from 2005 are currently under review. The results will provide a scientific baseline for work being undertaken by the LVWCC, the Lake Mead Water Quality Forum and its membership, and other interested groups.

Data for the mainstream Wash and tributaries collected between October 2000 and June 2003 is summarized in the document "Las Vegas Wash Monitoring and Characterization Study: Results for Water Quality in the Wash and Tributaries," available at lvwash.org. Current water quality data (July 2003 to December 2005) is stored in the SNWA's database.

2005 MAJOR ACCOMPLISHMENTS

Publications related to the Project Team's work in the area of water quality were released in 2005. The first, a peer-reviewed "Characterization of Boulder Basin, Lake Mead, Arizona-Nevada-Based on Analysis of 34 Limnological Parameters," was published in *Lake and Reservoir Management* in September 2005. Second, a document summarizing the limnological data collected from 2000-2005 "Limnological Status of Boulder Basin, Lake Mead, Nevada-Arizona, 2000-2004" was released. Third, a document summarizing the results of selenium and mercury samples collected in the Wash was published in *Environmental Monitoring and Assessment* entitled, "Sources and Concentrations of Mercury and Selenium in Compartments within the Las Vegas Wash During a Period of Rapid Change." Fourth, there was a publication in *Southwest Hydrology* "Effects of the Drought on Water Quality in Lake Mead." Fifth, data from the tributary water quality sampling program were summarized in a paper published in *LakeLine* "Contaminants in Urban Runoff: Looking at Southern Nevada." Additionally, the Bureau issued a report entitled "The Limnology of Boulder Basin, Lake Mead, Arizona-Nevada, 1990-1998."

Real-time water quality monitoring sites were changed in 2005 to make the locations more permanent. Previously, monitoring equipment had to be removed from the Wash in rain events because they could be washed away by large storms. The monitoring equipment at LW0.8 was attached to the Lake Las Vegas Dam and the equipment at LW6.7 was moved to LW3.4 and attached to the Rainbow Gardens Erosion Control Structure. The equipment in Duck Creek was redeployed and attached to the newly constructed Duck Creek Bridge on Broadbent Road. Real-time water quality monitoring equipment was also deployed in Flamingo Wash and attached to the bridge on Nellis Avenue. Location changes for the equipment have allowed for more continuous water quality readings since the equipment can remain in place during rain events. (see map on page 16 for sampling locations).

Data collected from Pabco wells were used by the Nevada Division of Environmental Protection (NDEP) and the USEPA to determine the effectiveness of the Tronox (Kerr-McGee) perchlorate remediation system. Mainstream and tributary data were used by NDEP, USFWS, and USEPA to determine if water quality standards were met in the Wash. The Clark County Regional Flood Control District used the mainstream and tributary data to satisfy stormwater permit requirements for the Municipal Separate Storm Sewer System (MS4). The NDEP used the information generated from the TSS study to remove the Wash from the 303 (d) List for Impaired Water Bodies. The CWC used real-time water quality, mainstream and tributary data to develop a three dimensional model of the Boulder Basin of Lake Mead. This model was used extensively for the SCOP Draft Environmental Impact Statement to show the impacts of changing the discharge point for the highly treated wastewater.

2006 OPERATIONAL OBJECTIVES

The Project Team is conducting an investigation of water quality and limnology parameters of sampling locations in the Colorado River and Overton arms of Lake Mead. This extension of the existing sampling program is being initiated in preparation for long-term water resource planning decisions. Plans are under way to modify and enhance the existing Boulder Basin sampling program to collect background information for the construction of the Southern Nevada Water System Intake No. 3 and the CWC's SCOP project operations. Sampling within the Wash will continue. Sites include identified Wash locations, six tributary sites, one remaining shallow groundwater site, six shallow groundwater wells, seven TSS locations in the Wash and real-time water quality monitoring locations in the Wash and its tributaries.

Data generated from the monitoring programs will be summarized into reports. Nutrient loading into Boulder Basin will continue to be evaluated as a predictive device related to algae occurrences.



Wetland Demonstration Projects



RELEVANCE TO CAMP

Scientists have initiated two wetland demonstration projects to determine if constructed wetlands can be used to improve water quality in the Wash, and thus in Lake Mead. These projects, one within the Henderson Water Reclamation Facility (Henderson WRF) and one within Pittman Wash, will demonstrate whether wetlands can be used to further filter and polish two of the most significant sources of flows in the Wash, treated wastewater and urban runoff, by removing nutrients,

TSS and other constituents of concern. The Bureau, City of Henderson, Project Team, and the SNWA partnered to construct the Demonstration Wetland at the Henderson WRF and were joined by the Clark County Regional Flood Control District to initiate the Pittman Wash Pilot Wetlands project.

OVERVIEW

The Demonstration Wetland at the Henderson WRF is a pilot project specifically created to evaluate the water quality benefits of constructed wetlands on treated wastewater flows (approximately 85 percent of the flows in the Wash). This project utilizes a 5.75-acre triangular pond with three loafing islands and 11 submerged planting beds, called hummocks. The hummocks comprise 18.6 percent of the pond. Varying species of vegetation have been planted on the hummocks based upon their reputed water polishing benefits. Source water for the demonstration wetland is provided by the Henderson WRF. The goal is to acquire information about the effectiveness of the wetland at improving water quality. Emergent vegetation best suited to ecological conditions in Southern Nevada is also evaluated in the process.

There are five water quality sampling locations within the wetland: inlet, outlet, midpoint and two perimeter sites. For quality assurance purposes, sampling and data collection methodologies for all sites are identical. Some constituents analyzed include, biochemical oxygen demand, TSS, total coliforms, total phosphorous, nitrate, nitrite, Total Kjeldahl Nitrogen (TKN), ammonia and trace metals. Samples are drawn from approximately 12 inches beneath the surface and 12 inches above the bottom. ydrolab profiles measuring dissolved oxygen concentration, pH, electrical conductivity, and temperature are taken at 12-inch intervals at each sample location. Prior to filling the pond, baseline water quality data were gathered from the inlet site. Birds and vegetation within the pond are also monitored.



A variety of water birds, such as this pied-billed grebe, take refuge in the emergents planted at the Demonstration Wetland.

Funded by the Bureau, the Pittman Wash Pilot Wetlands project has also been initiated. The 1/2-acre pilot project is designed to determine the effect of constructed wetlands on the water quality of urban runoff, which represents about 10 percent of

Vegetation covering the Demonstration Wetland is now extensive.





The Pittman Wash Pilot Wetlands project, near the Arroyo Grande Sports Complex in Henderson, was planted during 2005.

Wash flows. Project goals also include evaluating the feasibility of operating constructed wetlands in an urban flood control channel, identifying challenges and constraints associated with this type of setting and optimizing design and construction techniques. A full-scale tributary treatment wetland may be constructed after the study.

The project site, located adjacent to the Arroyo Grande Sports Complex, is divided into two cells—a subsurface flow cell and a surface flow cell—to determine which offers the most significant water quality benefits. The subsurface cell consists of 3/4-inch gravel to a depth of about two feet. The surface cell consists of open water areas interspersed with shallow planting beds. The planting beds rest two to four inches below the water's surface to allow various plant species to flourish. Each of the cells is lined with clay to prevent infiltration by shallow groundwater. Water enters the cells via a diversion channel that carries flows from the main tributary channel. There are three sampling ports in each cell—one at the inflow, one in the center, and one at the outflow.

PROGRESS SINCE INCEPTION

At the Demonstration Wetland at the Henderson WRF, early work was predominantly related to cultivating hummocks and developing sampling and analysis protocols. Although establishing wetland vegetation on the hummocks proved challenging, adequate growth was achieved in 2004. Three species dominate the pond: California bulrush, Olney's threesquare bulrush and hardstem bulrush, and answer the question of which emergent species are best suited to site conditions. Sampling activities related to the Demonstration Wetland project were initiated in August 2004. From August through October 2004, water quality samples were collected twice per month. Subsequently, they have been collected on a monthly to bimonthly (in the winter months of 2005) basis. Bird monitoring activities are conducted on two non-consecutive days surrounding water quality sampling dates. More than 15,000 birds and more than 90 species have been identified. Vegetation monitoring and plant tissue sample collection activities occurred in the fall of 2005.

The Pittman Wash Pilot Wetlands project was initiated in 2003. Design was originally developed for a one-acre site. However, the projected cost of construction necessitated reducing the project size by half. The project was constructed in the spring of 2005 in its modified form, a 1/4-acre subsurface flow cell and a 1/4-acre surface flow cell, for a total project area of a 1/2-acre. Following construction, both cells were planted with bulrush. Summer and fall storms brought heavy flows to the Pittman Wash and the pilot wetlands were inundated with sediment. Site restoration activities are under way.

2005 MAJOR ACCOMPLISHMENTS

At the Demonstration Wetland at the Henderson WRF water quality data collection continued into a second year. Both Hydrolab profiles and water quality parameters were gathered

as outlined in the program's monitoring plan. Although research will need to continue for a second year of data collection, early analyses suggest the Demonstration Wetland positively influences water quality with regard to TSS, nutrients, biochemical oxygen demand and some heavy metals. Preliminary results were presented at the 2005 Nevada Water Environment Association conference.

Bird monitoring continued in 2005 with an additional 23 species identified, bringing the total to 94 since the study commenced. Data from the first year of avian monitoring were presented at the 2005 Western Field Ornithologists Annual Meeting. The Project Team collected vegetation data on the



California bulrush is among one of the species of plants that have adapted well to wetland demonstration projects conducted by the Project Team.

three bulrush species in November 2005 to evaluate stem density, ratio of live/dead plant stems, average height, percent cover and biomass. Plant tissues were sampled and will be analyzed for nutrients and various metals.

Site construction for the Pittman Wash Pilot Wetlands project was completed in April 2005. Four species of bulrush were



Wetland projects have proven to be a perfect resting spot for waterfowl to stretch their wings during seasonal migration.

identified as suitable for the project site and were planted in May and June. On July 24, 27 and August 14, a series flood events filled the site with sediment. The site was restored and readied for planting but not before a rain storm on October 18 again filled the site with sediment. In an effort to protect the site from damage from future storms, plans were made to increase the height of the concrete walls surrounding the site and a contractor was sought to perform the fortifications. Work also began on the monitoring plan for all sampling activities to be carried out in the wetlands project.

2006 OPERATIONAL OBJECTIVES

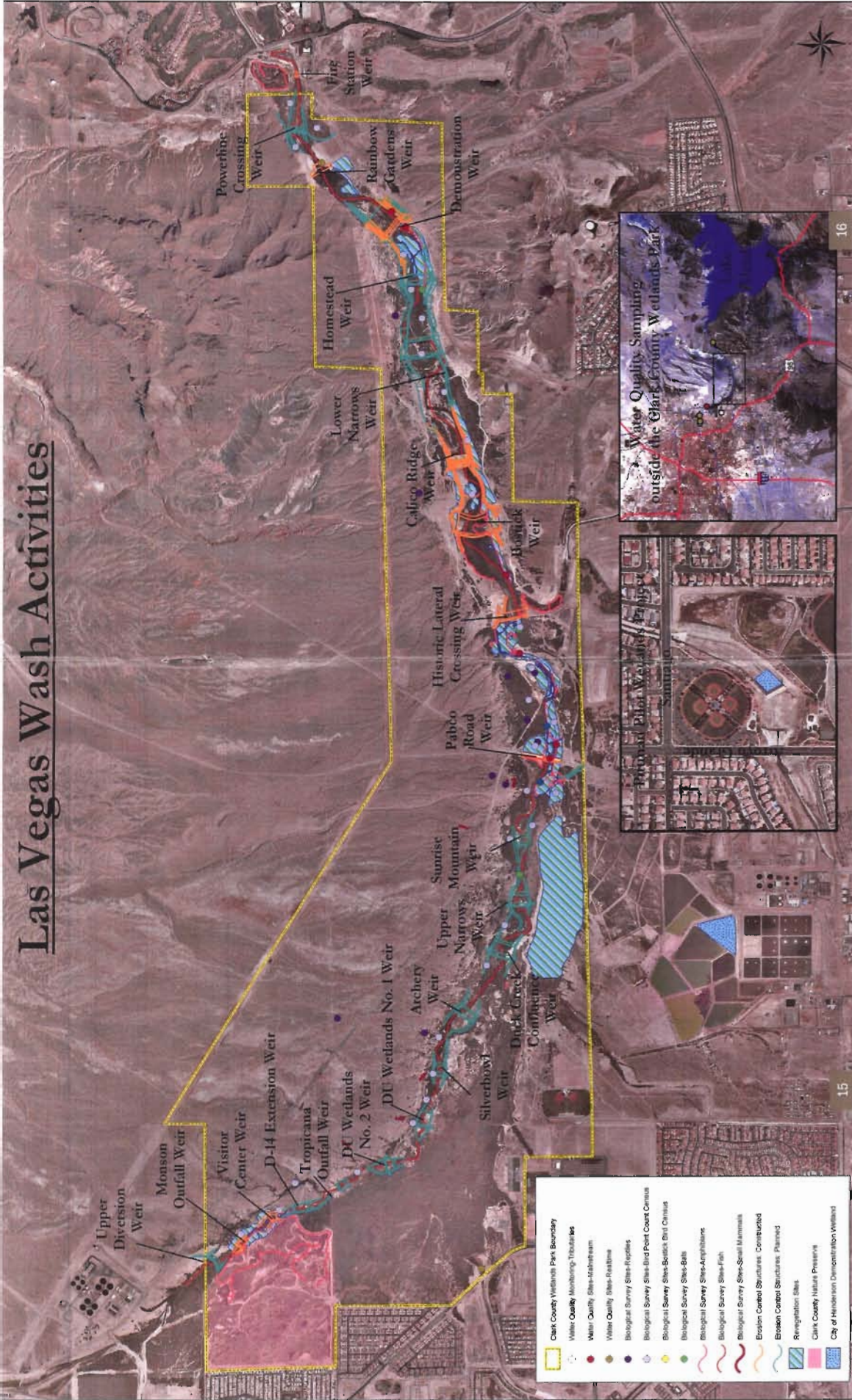
At the Demonstration Wetlands at the Henderson WRF, monthly sampling will continue during 2006, after which results will be evaluated. Those findings will be developed into a report for the Research and Environmental Monitoring Study Team, as well as potentially for other organizations evaluating the effectiveness of wetlands for improving water quality.

Vegetation and bird monitoring studies will also continue through the year. Vegetation data collected in late 2005 will be analyzed. Further quantitative measurements of vegetation will be conducted and compared with 2005

data. Bird census data based upon the two years of monitoring will be analyzed to provide initial estimates of bird nutrient contribution to the wetland. Both the bird and vegetation data will be summarized in a report.

At the Pittman Wash Pilot Wetlands project, the height of the concrete walls will be raised in an effort to protect the site from damage related to high-velocity floodwaters. Planting activities are scheduled for early spring 2006 to allow adequate growth of the vegetation so that water quality monitoring can begin by late summer. The monitoring plan will be finalized before sampling activities commence.

Las Vegas Wash Activities



- Clark County Wetlands Park Boundary
- Water Quality Monitoring Tributaries
- Water Quality Sites-Stream
- Water Quality Sites-Reserve
- Biological Survey Sites-Riparian
- Biological Survey Sites-Bird Point Count Census
- Biological Survey Sites-Belted Owl Census
- Biological Survey Sites-Balls
- Biological Survey Sites-Aspen/Willows
- Biological Survey Sites-Fish
- Biological Survey Sites-Small Mammals
- Biological Control Structures - Constructed
- Biological Control Structures - Planned
- Revegetation Sites
- Clark County Nature Preserve
- City of Henderson Demonstration Wetland

Fish and Wildlife

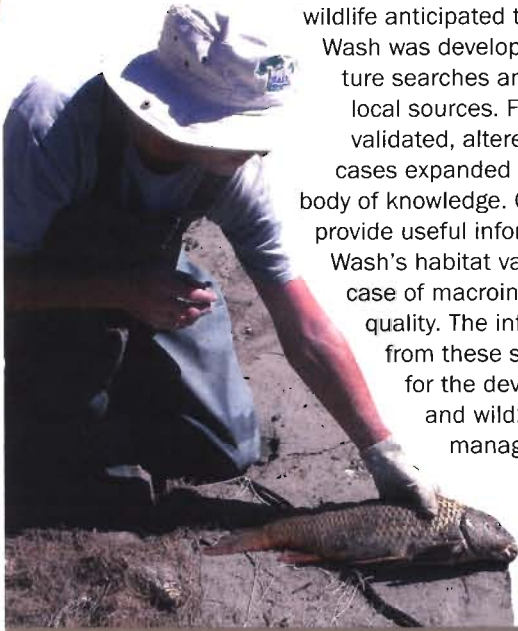


RELEVANCE TO CAMP

Because the existing ecological studies related to the Wash were conducted three decades ago, it was necessary to both re-establish valid baseline data and conduct longitudinal research to gage the impact of CAMP-related activities on wildlife. The map located on pages 15 and 16 identifies the type and location of the fish and wildlife research being conducted. Macroinvertebrate surveys help to monitor both water quality and habitat issues associated with erosion control construction.

OVERVIEW

As defined in existing LVWCC documents, the term "wildlife" encompasses, at a minimum, the following categories: birds, fish, small mammals and reptiles. To establish a current and valid data set of species, biological surveys have been and continue to be conducted along the Wash through the Research and Environmental Monitoring Study Team. The initial catalog of wildlife anticipated to reside in the Wash was developed through literature searches and data from other local sources. Field work has validated, altered and in some cases expanded upon the existing body of knowledge. Ongoing surveys provide useful information about the Wash's habitat value, and in the case of macroinvertebrates, water quality. The information gathered from these studies will allow for the development of a fish and wildlife adaptive management plan.



Carp are one of the more prevalent species that have been identified in the Wash.

PROGRESS SINCE INCEPTION

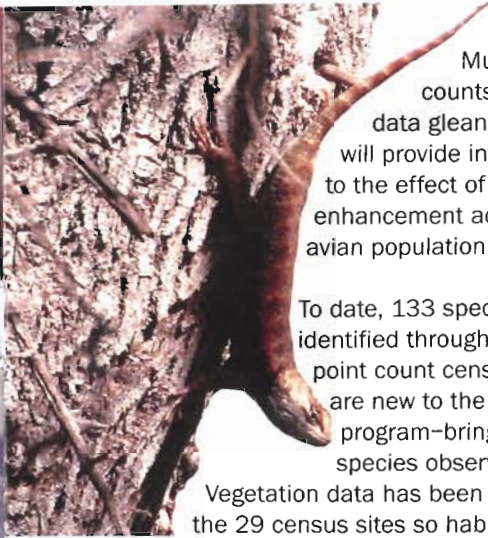
Through 2005, ongoing bird monitoring documented the presence of 159 avian species within the Wash study area, an increase of 26 species from the previous year. Initial baseline studies have now been completed in several categories: birds, fish, amphibians, bats, reptiles, and small mammals. These monitoring activities are a valuable tool to gage wildlife health as the Wash environment improves.

In addition to providing baseline data about the Wash's role as a wildlife habitat, the information collected since studies commenced provides important benchmarks from which the effects of construction and revegetation activities may be calculated. This in turn will help shape decisions integral to the long-term management of this environmental resource.

2005 MAJOR ACCOMPLISHMENTS

The avian population of the Wash is being identified through two studies: an ongoing cooperative census with the Red Rock Audubon Society at the Bostick Weir, and a Bureau-funded point count bird census. Initiated in February 2005, the point count census entails monitoring at 29 sites distributed throughout the Wash. Sites were identified within wetland, riparian and upland habitats both within revegetated areas and in locations whose habitat has not been enhanced. Ornithologists from the San





Bernadino County Museum perform the counts. Comparison of the data gleaned from the census will provide information related to the effect of stabilization and enhancement activities on the avian population over time.

To date, 133 species have been identified through the Wash avian point count census—26 of which are new to the monitoring program—bringing the total avian species observed to 159.

Vegetation data has been collected at each of the 29 census sites so habitat/species associations may be correlated. Bureau grant funding will allow census activities to continue so trend analyses can be conducted.

The multi-year amphibian study was completed in October 2005. Using high intensity lights, researchers observed amphibian species at nine sites within the Wetlands Park boundary, including at several erosion control structures. Several miles of habitat were searched visually and aurally; global positioning system equipment was used to record observations, transects, and mark populations. Two species were identified: the American bullfrog and the Woodhouse's toad, which are on the Multiple Species Habitat Conservation Plan (MSHCP) watch list.

Two years of data collection for the Bat Study, funded by a Bureau grant, was completed; 17 species have been detected to date. Advances in observation techniques markedly improved the efficiency of the data collection process.

2006 OPERATIONAL OBJECTIVES

The Las Vegas Wash Fish and Wildlife Adaptive Management Plan is scheduled for completion in 2006. This document will represent the most comprehensive view of the Wash as a wildlife habitat ever created, and will also provide guidance related to the long-term sustainability of the species found there.

The amphibian and bat summary reports will also be available in 2006. Avian census activities will continue through 2006 and summary reports for both studies will be produced. The Bureau will continue to collect macroinvertebrate samples quarterly to assess the health of this portion of the ecosystem relative to various environmental conditions; a document summarizing the results is scheduled for completion in 2006. The Bureau will be conducting a butterfly survey as well.



Amphibians such as the bullfrog (above) and desert spiny lizard (left) are common species throughout the Wash.



Butterflies are an important part of the ecosystem. By enhancing vegetation throughout the Wash, the Project Team is also creating more habitat for beautiful insects such as these.

Vegetation Enhancement and Management

Chapter: 6

Action Items: 1, 18, 21-25, 32, 43, 44

FOR ACTION ITEMS LISTING,
SEE PAGES 3-4



RELEVANCE TO CAMP

Under the 404 permits issued by the U.S. Army Corps of Engineers (Corps), wetland vegetation displaced by the construction of erosion control structures must be mitigated. The Vegetation Enhancement and Management Program encompasses activities specifically designed to fulfill established mitigation requirements, which are estimated at 176 acres according to the Las Vegas Wash Capital Improvements Plan. The 404 permit further specifies vegetation survival rates, invasive encroachment limitations, species composition and species cover, all of which require ongoing monitoring and maintenance. The map on pages 15-16 identifies the type and location of vegetation mitigation sites being monitored. In addition to the vegetation mitigation required for the 404 permits, stormwater permits issued by the state also require revegetation activities. Disturbed areas are required to be revegetated to 70 percent of the pre-construction native vegetation cover.

tion and an acreage-based non-native invasive encroachment rate of less than 20 percent. Ongoing revegetation activities in several areas along the Wash were supported by funds from the Bureau, the MSHCP, Southern Nevada Public Lands Management Act (PLMA), NDEP, and the Nevada Division of State Parks (NDSP).

To help support the mitigation requirements, the Las Vegas Wash Weed Partnership (Weed Partnership) continues its efforts to control invasive species in the Wash. This is a multiagency committee that coordinates weed management activity on the Wash.



Broom baccharis is one species of revegetated shrub that thrives in the Wash.

OVERVIEW

The planting, monitoring and invasive management components of the program, conducted with oversight by the Research and Environmental Monitoring Study Team, are all specifically focused on meeting the criteria set forth in the Project Team's 404 permits, without which stabilization work would be unable to progress. There are peripheral benefits associated with this work as well, such as habitat enhancement, public outreach and bank stabilization benefits, but the primary impetus for these activities is the 404 permit. In addition to stipulating a 1:1 acreage mitigation ratio, the 404 permit mandates a documented 80-plus percent survival rate for installed vegeta-

PROGRESS SINCE INCEPTION

The Las Vegas Wash Capital Improvements Plan estimates that 176 acres will be required to mitigate the impact of the erosion control program. Revegetation efforts initiated since 2000 have encompassed approximately 75 acres. Approximately 55 acres of the total acreage can be applied toward revegetation requirements associated with erosion control projects. Of that 55 acres, 33.5 are classified as wetlands. Wetland acres are used to meet 404 permits, while non-wetland acres are used for other permit obligations. The remaining 20 acres not used for permitting compliance are used to satisfy requirements associated with grants, which represent a significant funding source for stabilization activities.

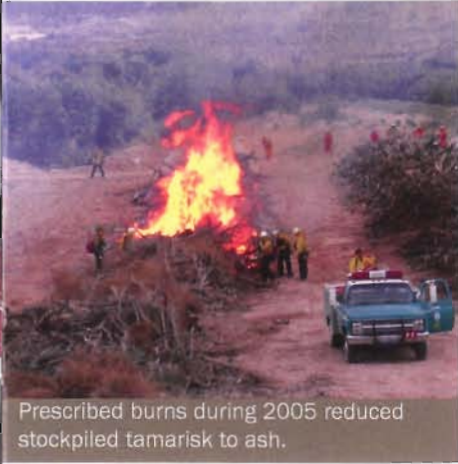
Calico Ridge planting site—July 1, 2005—one month after bulrush planting.



2005 MAJOR ACCOMPLISHMENTS

Approximately 14 acres were revegetated with wetland, riparian and upland plants in 2005. Required monitoring to ensure all sites met the 80 percent survival rate for planted vegetation was completed. The Project Team's ability to consistently exceed the required survival rate is attributable in large measure to the development of best management practices related to species selection, irrigation techniques and invasive weed management.

A 60-acre site was prepared for revegetation through collaboration between the Bureau, which cleared the area,



Prescribed burns during 2005 reduced stockpiled tamarisk to ash.

and the Nevada Division of Forestry, which conducted the prescribed burn of the cleared material. Staff created a planting design for the area, which optimally will incorporate approximately 18,000 plants. Much of the project, funded by PLMA, NDEP and NDSP, will be mesquite.

Weed control activities continued through 2005, highlighted by two prescribed burns, at which 48 acres of tamarisk were burned. A total of approximately 60 acres of tamarisk was removed in all. An additional 65 acres of dense tamarisk forest have been targeted for removal in the future. Project Team staff are currently evaluating potential removal options. Additional stock pile locations have been identified as storage areas and potential burn sites for cleared tamarisk and other weeds.

Thanks to continued efforts by the Weed Partnership, no living stands of giant reed currently exist at the Wash. National Park Service personnel completed the eighth biannual treatment for tall whitetop since 2002; that effort has been unequivocally successful and is now in maintenance mode. Given the success of existing weed management activities, additional invasive species are being identified and treated. They include horehound, tree tobacco, silverleaf nightshade, Sahara mustard and ravenna grass.

The Project Team also reached an agreement in April 2005 with the Pahrnagat National Wildlife Refuge to harvest bulrush for transplanting to the Wash. Facilitated through a special use permit granted by the USFWS, the agreement allowed staff to acquire more than 1,300 one-gallon specimens for revegetation activities (see bottom photos on pages 19 and 20). The Vegetation Monitoring Report for 2002/2003 was submitted to the Corps, documenting the success of the planting sites and requesting the release of 14.5 acres.

2006 OPERATIONAL OBJECTIVES

The Project Team will focus on the prepared 60-acre site in 2006, with the goal of establishing vegetation throughout the entire parcel. Installation of an above-ground irrigation system is included in the work plan, as is the development of a monitoring program.

Vegetating soils immediately adjacent to erosion control structures, a technique referred to as "bio-armoring," has proven extremely effective at helping maintaining the structures' integrity during storm events and reducing the likelihood of erosion-related damage. The revegetation efforts also will continue to play a critical role in ensuring erosion control projects are not impeded by mitigation requirements.

To support ongoing revegetation activities, the Project Team is collecting native seed to supplement available supplies. Additionally, the harvesting agreement with USFWS will also continue, facilitating collection of bulrush from the Pahrnagat National Wildlife Refuge in spring and fall.

Calico Ridge planting site- August 29, 2005-three months after bulrush planting.



Archaeological Resources

Chapter: 7

Action Items:
21-25, 32, 41-44

FOR ACTION ITEMS LISTING,
SEE PAGES 3-4

RELEVANCE TO CAMP

The cultural resource activities that are being conducted in the Wash include identification, evaluation and mitigation of sites that would be impacted by Wash activities.

Existing archives at federal agency offices and museums were researched to consolidate information from cultural resource studies conducted in the Wash in the 1970s.

OVERVIEW

The Wash contains a number of cultural resource sites that have the potential to provide significant data for the understanding of the historic and prehistoric desert culture and lifestyle

in the Southern Nevada area. The Las Vegas Wash Archaeological District was established in 1977, and expanded in 2001 to encompass additional sites. The revised Archaeological District boundaries fall primarily within the Wetlands Park. Some archaeological sites within the Archaeological District have been lost or damaged due to erosion of the Wash, off-road vehicle activity, illegal collection and other activities. In order to protect and understand the area's prehistory and history, the sites that remain need to be preserved and/or their data collected.

PROGRESS SINCE INCEPTION

Cultural resource field inventories have been completed for the entire Wetland Park area, which have resulted in the identification and documentation of 56 cultural resource sites. This information is used in the planning and siting of projects such as erosion control structures, trails and roads. In 2002, a pit house feature was excavated.

This pit house was at risk of being lost due to erosion, and information gathered from it is important to understanding a little-known period in the prehistory of Southern Nevada.

Leon Rockwell
Wash photo,
1909.

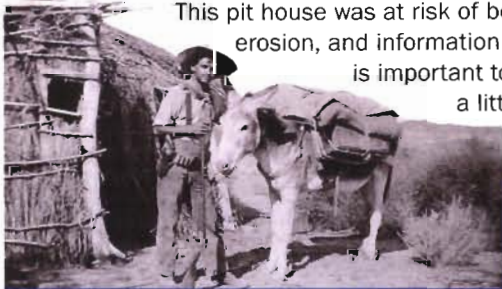
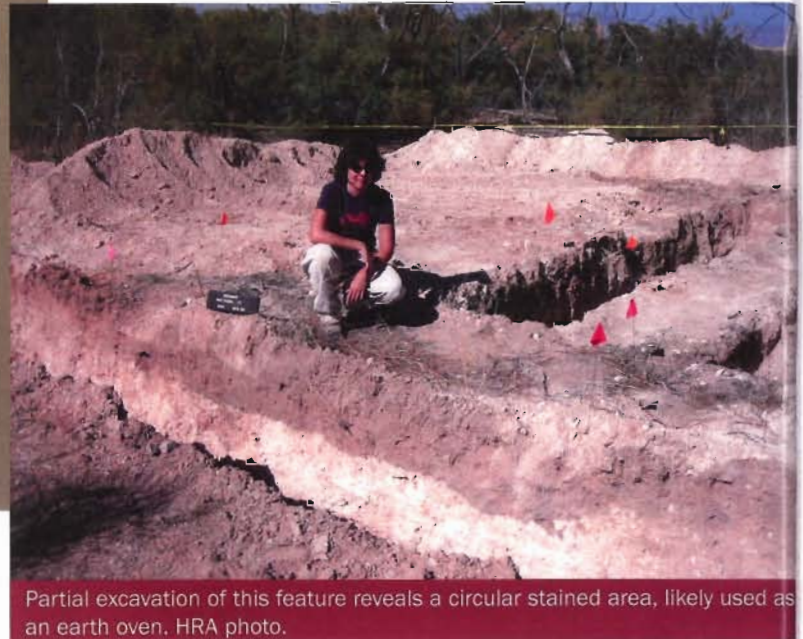


Photo courtesy of *The History of Clark County Wetlands Park, Henderson, Nevada*, HRA.



Partial excavation of this feature reveals a circular stained area, likely used as an earth oven. HRA photo.

2005 MAJOR ACCOMPLISHMENTS

In preparation for upcoming bank stabilization and erosion control projects along the Wash, the SNWA and Bureau sponsored archaeological testing activities at three sites within the Wetlands Park boundary. The testing was conducted by HRA Conservation Archaeology, Inc. (HRA).

Two sites in the Wash's western portion were tested in preparation of the construction of a planned weir. Broken pottery pieces, known as "potsherds," collected indicate the sites were occupied between AD 500 and 1850. Other evidence, such as projectile points, hint that the site may have been used 4,000



Old Spanish rock house on the North side of the meadows in the Wash. Leon Rockwell photo, 1909.

or more years ago. Charcoal samples from the site will be radiocarbon dated to provide a more precise estimate of site occupation. One of the sites, probably occupied 800 to 1,300 years ago, revealed remains of a simple house structure and cooking pits. These features indicate the occupants lived in earth lodges, probably stored edible plants and cooked their food in pits.

The other location did not produce housing structure evidence, but did demonstrate the presence of many subsurface pit features that were

apparently used for the storage of food. The pits vary in size but measure up to two feet in diameter and 30 inches deep. Potsherds and other artifacts indicate two separate occupations—one between AD 1250 and 1800, the other between 2,000 and 4,000 years ago. Site testing revealed approximately 60 pit features; preliminary estimates indicate between 400 to 600 features could remain buried within site boundaries. The discovery of this collection of subsurface pit features is unique within the Las Vegas Valley. An historic site, likely associated with the Bishop Ranch and later Glendale Farm, was evaluated in preparation of constructing an upcoming weir. It consists of a concrete foundation likely from a house or shack, a shallow well, an



Once trenches are excavated, archeologists examine the trench walls for charcoal stains that may represent storage pits, hearths or living structures. HRA photo.

irrigation or drainage ditch and segments of several stone slab paths leading to the well and other unidentified destinations. The Bishop Ranch existed in this area from approximately 1910 until possibly the 1930s. The main house of the ranch had been previously excavated by archaeologists in the late 1970s.



The recently excavated pithouse might have looked like this when it was in use. Daniel Boone Lindeman photo, 1912. From the *Handbook of North American Indians*.

2006 OPERATIONAL OBJECTIVES

HRA has completed the current round of excavations in the Wetlands Park. The next step will be to analyze the artifacts, samples and other data collected during the projects, after which HRA will prepare reports presenting its findings.

A research project documenting the historical occupation of the Wash is scheduled for completion in 2006. In addition to the chronological account of various occupants, the document will include details on plants, geology and hydrology.

The Project Team has been working with the Bureau, Corps, Nevada State Historic Preservation Office, the Advisory Council on Historic Preservation and Clark County to develop a programmatic agreement that will streamline archaeological compliance work in the Wash.

Education and Outreach

Chapter: 8

Action Items:
18-25, 32, 43, 44

FOR ACTION ITEMS LISTING,
SEE PAGES 3-4

RELEVANCE TO CAMP

Because management of the Wash is in the public interest, providing updates and maintaining an ongoing communication program that disseminates information and provides a conduit for input and feedback is essential. Key audiences include environmentally oriented residents, local and regional elected officials, and other stakeholders of the Wash.



OVERVIEW

Education and outreach activities were established in a strategic communication plan developed by and executed under the oversight of the Administrative Study Team. This plan has since been revised to reflect current organizational goals. Outreach tactics include, but are not limited to, community volunteer events, briefings, print and collateral materials, displays, video and multimedia presentations, tours and educational materials for schools.

PROGRESS SINCE INCEPTION

Since the adoption of the public outreach plan, Project Team staff members have participated in dozens of community events with a cumulative attendance in excess of 75,000 people. Seventeen Wash improvement volunteer events have been coordinated to date, including the largest one-day volunteer planting event in Nevada's history. In total, more than 1,800 volunteers have helped add approximately 22,000 plants to the Wash's landscape. The Wash Clean-Up, predecessor to the

semiannual Wash Green-Up planting event, resulted in the removal of more than 500,000 pounds of illegally dumped trash from areas adjacent to the Wash. Through the "adoption" of Mabel Hoggard Elementary School and



Students from Mabel Hoggard Elementary School peer off into the Wash during one of their scientific expeditions.

other broad-based outreach projects targeting students, the Project Team distributes educational materials to thousands of school-age children, as well as primary and secondary teachers through the H2O University program. In addition to making information about the Wash and related projects available to the public, the *lvwash.org* Web site elicits scores of e-mails and nearly two dozen tour requests annually.

2005 MAJOR ACCOMPLISHMENTS

Ongoing projects coordinated by the Project Team have provided the public outreach staff continuous opportunities to disseminate information about the Wash and progress related to the CAMP. In addition to the two Wash Green-Up volunteer plantings— which drew several hundred residents and garnered media attention—the Project Team worked



closely with other community-based organizations to seek collaborative opportunities. For instance, the Project Team co-hosted a weed removal event with the Clark County Cooperative Weed Management Area.

Additionally, the Mabel Hoggard Elementary School partnership has continued to thrive.

Recognizing public interest in volunteerism, the Project Team is developing ongoing outreach opportunities so interested members of the public have greater flexibility in terms of participating in Wash-related activities.

Most recently, the Project Team received a third 319-grant from the NDEP, which it used to further Mabel Hoggard students' interest in environmental studies. Using the grant funding, staff acquired and assembled "Scientist backpacks" for student field trips in the Wash. Each of these backpacks

contains a GPS unit, binoculars, pH strips, scissors, tape, gloves and a recently revised field notebook.

The "Plants and Animals of the Las Vegas Wash and Clark County Wetlands Park" guide was created with grants from the Nevada Division of Forestry and the Bureau. More than 2,500 were printed. The guide includes information on 84 species of plants, fish and wildlife most common to the Wash.

The *lvwash.org* Web site continues to serve as an important public education resource, drawing an average of approximately 5,000 visitors per quarter in 2005. In addition to serving as a vehicle for interested stakeholders and the general public, the Web site also serves as a promotional platform for events such as the Wash Green-Up, generating scores of volunteers.

The Project Team also has a substantial presence in the SNWA newsletter *Water Wise*, which has a distribution of approximately 650,000 households. Through the 319 grant provided by NDEP, the Project Team also participates in the production of the annual *Water Smart Calendar*, which reaches a similar number of residences; collaboration on this project affords the Project Team an opportunity to infuse watershed-related text into the calendar.



Wash Green-Up events continue to be a hit as each year hundreds of volunteers assist with planting.



During a 2005 weed pulling event, Girl Scouts competed for an award for pulling the longest tamarisk root.

2006 OPERATIONAL OBJECTIVES

Having successfully executed the spring 2006 Wash Green-Up, during which approximately 180 participants planted close to 2,000 plants on more than 7.5 acres, the Project Team is planning for the October planting event. Participation at high-traffic community events will continue to be a priority given the opportunity they provide to reach a large audience.

The permanent interpretative kiosk conveying information about the Wash's water sources, importance and the role of the LVWCC-funded by the NDEP's 319 grant-will be installed as part of a wayside along the proposed trail system being developed by Clark County Parks & Recreation.

Data Resources

Chapter: 9

Action Items: 18-20, 24-29, 30, 32, 33, 43, 44

FOR ACTION ITEMS LISTING, SEE PAGES 3-4



RELEVANCE TO CAMP

The data management projects undertaken on behalf of the LVWCC support virtually all of the Action Items identified in the CAMP document. From water quality to bioassessment monitoring, the ability to store, access and share data significantly enhances the ability of LVWCC members to collaborate efficiently. The data management tools developed to support implementation of the CAMP

allow agencies to quickly access relevant project information.

2005 MAJOR ACCOMPLISHMENTS

One of the major additions to the *lvwash.org* Web site is the botanical inventory database. Reflecting inventories conducted by the Project Team beginning in fall 2002, this online database provides public access to the information compiled through field surveys. Other biological survey data sets are available through the site as well.

Aerial photography, ongoing since 2001, has been incorporated into the members' Web site "Flash mapping tool" so stakeholders can track changes in vegetation and erosion over time. In addition to the enhancements to the mapping tool, Data Resources staff also streamlined the process for adding images to the existing online repository, saving Project Team staff a

OVERVIEW

Although data-related projects run the gamut from the public *lvwash.org* Web site to specific mapping applications, the primary focus of the Data Resources Team is development and maintenance of a central data repository accessible to participant organizations. Coordinating with other agencies to optimize compatibility of data management practices, along with providing a high level of technical support to the staff utilizing the repository, remains a priority for the Data Resources Team.

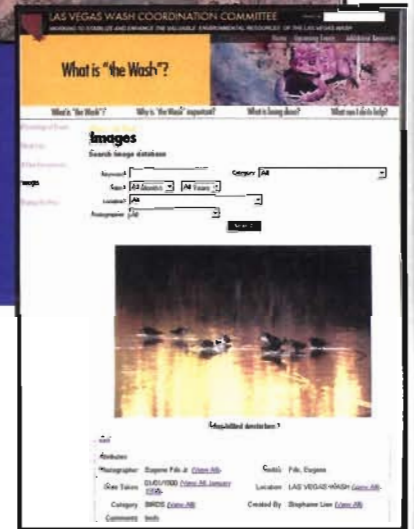
PROGRESS SINCE INCEPTION

Responsibilities related to the maintenance of the public domain Web site, *lvwash.org*, are ongoing. Since its development in 1999, the Web site has evolved to reflect an emphasis on the implementation of the CAMP Action Items. The site's design is also updated periodically to maintain a current appearance that is vital to Web visitation. The *lvwash.org* site houses several hundred pages featuring approximately 3,000 images, including charts, maps and photos.

The password-protected "members'" site serves an increasingly important role as a repository for information about ongoing activities and related data. The members' site also holds hundreds of sampling data points which can be viewed via real-time mapping tools and serves as a comprehensive tracking device for programs and activities related to the Wash.



Digital mapping (above) and internet resources (right) are among some of the ways the Project Team is using Data Resources to keep members informed about project status.



significant amount of time. The upgraded process also allows images to be viewed immediately from either the public or members' Web site.

To improve the usability of the members' Web site, staff developed online tutorials that allow participants to review Web site features at their own pace. The tutorials can be accessed from either office or home personal computers for flexibility.

Data loading continues to represent a significant portion of the Data Resources Team's responsibilities related to the LVWCC. During 2005, staff logged 564 requests, nearly 120,000 continuous profile samples, nearly 20,000 regular profile sample readings, more than 34,000 water quality values and 540 new images.

Since the LVWCC meets on a quarterly basis, a new monthly communication tool was needed to assist with intra-committee communication. In response to this need, the Project Team partnered with the Data Resources staff to develop a monthly update. This electronic briefing, distributed via e-mail, provides current information about new projects and ongoing activities.



Data Resources merges nature with technology to help biologists protect natural resources, such as this Las Vegas bearpoppy, by plotting the locations of vegetation onto aerial maps.

2006 OPERATIONAL OBJECTIVES

In October 2001, the Project Team produced a hard-copy "Project Tracking Report" based upon participant and stakeholder input. This document will be updated by the Project Team and Data Resources and will provide detailed information about ongoing and historical projects. The report will include projects conducted by the Project Team as well as projects other agencies are working on related to the Wash and surrounding areas. To have your project included in this report, please contact Beverly White at 702-862-3731. The report is scheduled for distribution in October 2006.

Given the projected increase in data loading activities, the Data Resources Team continues to explore process and technical innovations that will improve the efficiency of this important responsibility. Activities include identifying field

automation needs, improving coordination with laboratories and streamlining workflow processes.

One of the core functions of a comprehensive data repository is to identify trends and issues of importance. The Data Resources Team is working to develop new data visualization tools to facilitate and support those activities. Also related to data, staff is expanding the data repository's exportation function to allow both "vertical" and "horizontal" formatted water quality data.

Because interagency coordination is so critical to long-term management activities in the Wash, the Project Team will continue to liaison with information technology professionals to facilitate the efficient and accurate transfer of information among participating agencies.

Camp Action Items 2005 Progress Summary

Stabilization Activities

- Calico Ridge Weir completed (9th of 22 planned structures)
- 4,400 lineal feet of bank protection installed
- Powerline Crossing Weir construction initiated (completion scheduled for 2006)
- Upper Diversion Outfall Channel and Weir design completed
- 34,000 cubic yards of construction materials acquired and transported to the Wash
- DU No. 1 and No. 2 weirs nearing 90 percent design completion (construction in 2006)
- Sediment Transport Study for Wash above Pabco Road Weir completed
- New topographic mapping of the Wash area completed

Bioassessment Monitoring

- Conducted collection of bird eggs, fish tissue and water samples for analysis
- Completed data compilation for previous samples (in review by toxicologist)

Water Quality

- Completed peer review process for water quality data report
- Expanded water quality sampling locations to include upper arms of Lake Mead
- Published three peer reviewed papers
- Developed permanent locations for real-time water quality monitoring equipment
- Data from Wash used by a variety of agencies such as: NDEP, Clark County Regional Flood Control District, USEPA, USFWS and the CWC

Wetland Demonstration Projects

- Continued water quality monitoring at the Demonstration Wetland
- Continued bird survey at the Demonstration Wetland (23 additional species identified)
- Constructed Pittman Wash Pilot Wetlands
- Vegetation data collection occurred at the Demonstration Wetland
- Water quality and avian monitoring data from the Demonstration Wetland presented at regional conferences

Fish & Wildlife

- Initiated point count bird census and identified more than 25 new species
- Completed amphibian study
- Completed bat study data collection
- Prepared the Las Vegas Wash Fish and Wildlife Adaptive Management Plan outline and management objectives

Camp Action Items 2005 Progress Summary

Vegetation Enhancement & Management

- Revegetated approximately 14 acres with wetland, riparian and upland vegetation
- Cleared 60-acre site in anticipation of 2006 activities
- Conducted two prescribed tamarisk burns encompassing 48 acres of material
- Completed and verified eradication of giant reed in the Wash
- Continued treatment of tall whitetop
- Identified additional invasive species for management program
- Initiated bulrush harvesting program through Pahrnat National Wildlife Refuge agreement
- Collected seed for future revegetation sites
- Completed botanical inventory program
- Monitored revegetation sites
- Continued vegetation mapping of the Wash

Archaeological Resources

- Completed excavation of prehistoric encampment site within the Wetlands Park
- Completed excavation of prehistoric food storage site within the Wetlands Park
- Completed excavation of historic Bishop Ranch site at the Wash

Education & Outreach

- Conducted two Wash Green-Up volunteer planting events
- Co-hosted a weed removal project with the Clark County Cooperative Weed Management Area
- Developed and produced "Scientist Backpacks" for student outreach program
- Participated in Water Smart Calendar and Water Wise publication (circ. 600K+)
- Developed updated portable exhibits
- Completed "Plants and Animals of the Las Vegas Wash and Clark County Wetlands Park" field guide

Data Resources

- Maintained public *lwash.org* Web site (averaged 5,000 visitors per quarter)
- Maintained lake elevation charting software that imports Bureau data
- Implemented and maintained "Data Drop" application for interagency data sharing
- Supported 32,224 new water quality values to database

LVWCC Members

AGENCY 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
- National Park Service
- Nevada Division of Environmental Protection
- Nevada Division of Wildlife
- Nevada State Health Division
- Southern Nevada Health District
- Southern Nevada Water Authority
- University of Nevada Las Vegas
- U.S. Army Corps of Engineers

Mission

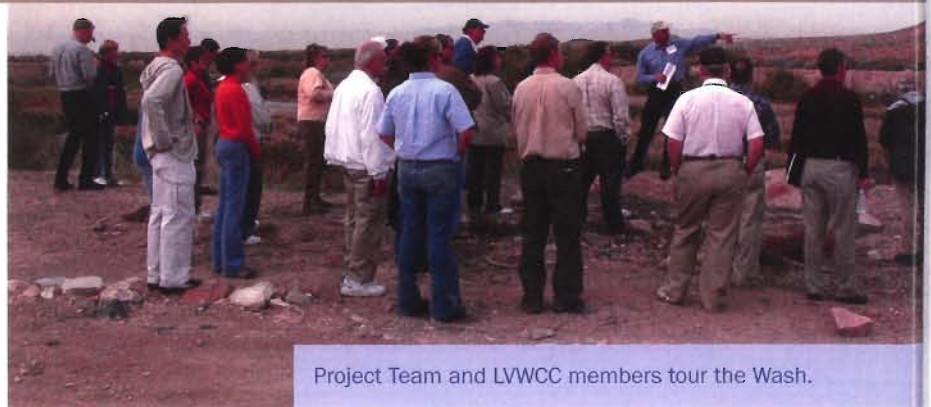
Working to stabilize and enhance the valuable environmental resources of the Las Vegas Wash.

- U.S. Bureau of Reclamation
- U.S. Environmental Protection Agency
- U.S. Fish & Wildlife Service
- U.S. Geological Survey
- U.S. Natural Resources Conservation Service

CITIZEN MEMBERS

- Basic Management Inc.
- Friends of the Desert Wetlands Park
- Lake Las Vegas Resort
- Las Vegas Boat Harbor
- Water Quality Citizens Advisory Committee

Las Vegas Wash
Coordination Committee
1900 E. Flamingo Road,
Mail Stop 105
Las Vegas, NV 89119
(702) 822-3300
lvwash.org



Project Team and LVWCC members tour the Wash.

lvwash.org



LWCC 2005 YEAR-END REPORT PHOTOGRAPHY COURTESY OF DICK BARRETT,
GENE HERTZOG, THE U.S. BUREAU OF RECLAMATION, U.S. FISH & WILDLIFE SERVICE AND SNWA STAFF.