

CHAPTER 10

ENVIRONMENTAL RESOURCES

STUDY TEAM

Objective

“How do we protect and enhance environmental resources within the Wash?”

Introduction

The gradual yet significant decline of environmental resources in the Wash due to erosion and headcutting has been of concern to local agencies and residents for almost 25 years. In 1975, the Wash supported approximately 1,400 acres of wetlands (excluding salt cedar) (U.S. Bureau of Reclamation, 1987); some sources even estimate the acreage in 1975 to be as high as 2,000 acres (Southwest, 1998b). However, in just 23 years, these numbers have decreased to about 300 acres in 1998 (SNWA, 1999). The continuous decrease of wetland vegetation in the Wash has affected a variety of plant and animal species that depend on habitat in the Wash for their sustenance.

Although the boundaries and role of the wetlands in the Wash have changed over the years, their importance to the Valley has not diminished. Wetlands are often considered “kidneys of the landscape” because of their role in filtering the effects of surrounding land use. They have widely recognized functions that include stormwater retention, water quality improvement and wildlife habitat (Randall, 1996).

Stabilizing the Wash and protecting and enhancing environmental resource conditions is the ultimate goal. While increasing wetland acreage will be one outcome of this plan, determining the potential impact that a changing water table (as wetlands are developed) may have is a critical component in understanding the complex interrelationship between the Wash and surrounding land. To meet this end, the Las Vegas Wash Coordination Committee established the Environmental Resources Study Team.

The Process

The Environmental Resources Study Team (Team) is comprised of 14 agency professionals specializing in areas ranging from vegetation and wildlife to wastewater, water resources and soils. The Team provides the expertise necessary to ensure the various environmental resource issues in the Wash are adequately addressed.

The primary purpose of the Team is to identify environmental resource issues in the Las Vegas Wash, and then recommend actions that will serve to facilitate protection, enhancement and restoration of those resources. To achieve this objective, the Team first identified two goals to accomplish throughout the process:

- Goal One -** Work to integrate and balance the various issues associated with restoration and enhancement of environmental resources within the Wash.
- Goal Two -** Work to maintain long-term integrity of the Wash.

The Team then narrowed their scope to six main environmental resource “categories” and made several recommendations, such as research investigations, technical support and cooperative efforts, that are necessary for the success of restoration and enhancement activities within the Wash. The six resource issues that were identified are discussed in more detail below.

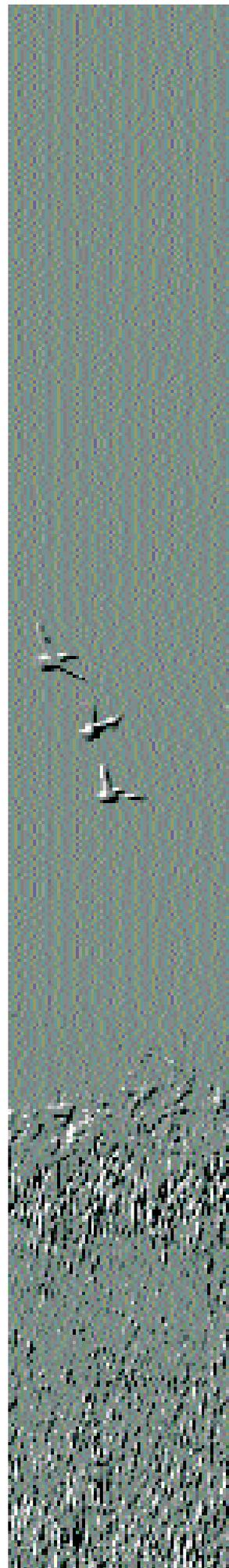
Water Quantity

One issue regarding the Wash has been whether there are associated water rights. Although no rights have been specifically granted to the Wash or to the Clark County Wetlands Park (Park), either through the Nevada State Engineer or through the U.S. Bureau of Reclamation (USBR), there is water reserved for the Wash in a more or less unofficial state, in that a portion of water returned to the Wash from use in the Valley is reserved for phreatophyte vegetation use by the USBR and the State of Nevada Colorado River Commission (CRC). This volume of water, 12,000 acre-feet per year (afy), is estimated to be more than the anticipated phreatophyte vegetation needs for the Park, which range from 10,100 to 10,600 afy (Southwest, 1995). The issue of the amount of water resources that will be available for preatophytes, other wetland vegetation and open water habitat for wildlife in the Wash is important to address when considering a comprehensive management approach for the Wash. A detailed discussion on water quantity within the Wash can be found in Chapter 2, Flows in Las Vegas Wash.

A phreatophyte is a plant that derives moisture from perennial ground water.

Water Quality

The quality of water in the Wash is instrumental in sustaining vegetation communities, healthy wildlife populations and all associated ecosystems that have developed along the Wash. The Wash is the outlet for all urban



flows in the Valley; because of this, there are many water quality issues that require attention and comprehensive management. A detailed discussion on water quality within the Wash can be found in Chapter 4, Water Quality.

Soils

Existing Conditions

As discussed in Chapter 3, Erosion in Las Vegas Wash, the majority of sediments that have been deposited into the Wash consist of easily eroded silts and clays with minor amounts of sand and gravel. Geologic evidence indicates that the Wash has undergone at least three natural cycles of down-cutting and subsequent back-filling prior to modern development. As deposition continues today, intermittent flows from convection storms and increasing perennial flows are cutting into the Wash floodplain and forming stream terraces, a process that has significantly altered the water table and internal soil drainage of soils in the floodplain. This process has been noted especially in the last 18 years, since a soils survey of the Valley was conducted in 1981 by the Soil Conservation Service (now known as the Natural Resources Conservation Service).

While current soil moisture conditions may vary from the 1981 soil survey (Soil Conservation Service, 1985), soil profiles in the Wash are fundamentally the same. This holds true as long as the soils have not been significantly eroded, removed, deposited or back filled by recent deposition (mainly sands and pebbles) in existing channels, and silts and clays along the upper floodplain.

Deposition and Equilibrium

The Wash is as dynamic a stream system today as it was in 1981; however, it no longer remains in equilibrium. A properly functioning equilibrium is a balance between sediment erosion and sediment deposition. Imbalance in the Wash has been evident when high peak flows remove more sediment than is deposited during low flows. This imbalance, the result of accelerated urbanization in the Valley, has increased channel flows, reduced the area of the floodplain, reduced retention times, minimized spreading of water on the floodplain and drained existing ground water into adjacent channels.

Soil Moisture

Soil moisture is critical to the survival of plant species in the Wash (Anderson, 1995). A constant source of moisture is important in a plant's seedling stage, and allows the roots of phreatophytes to grow to the water table. For example, cottonwood and willow seedling survival requires soil



moisture content of about 10 percent to prevent drying of roots (Stromberg, 1993 and Pinkney, 1992). Understanding soil moisture conditions present in the Wash is necessary for establishing wetlands and managing vegetation.

Soil Salinity

The primary effect of soil salinity in riparian ecosystems such as the Wash is that it restricts plant growth. For example, high soil salinity can be detrimental to plant growth and survival, as it often leads to loss of moisture through osmotic desiccation by drawing water from the plant back into the saltier soil environment. The tolerance levels of individual plant species to saline conditions can often be influenced by factors such as climate, amount of soil moisture, salt composition, soil texture and stage of development (Briggs, 1996). For these reasons, it is important to define the salinity concentrations of soils in the Wash, as well as characterize the soils as to the types of salts (e.g., minerals) present.

Soil Conditions and Planning for Vegetation Restoration

As discussed above, knowing more about the soils that exist in the Wash is crucial when planning vegetation restoration projects. For example, soils where the majority of soil has a texture heavier than a clay loam are not likely to be suitable for cottonwood and willow restoration and should be avoided. Similarly, sites with a very sandy soil or a high proportion of gravel and cobble will tend to be too dry and are not suitable for cottonwoods and willows unless they are very near the water table (Busch, 1992).

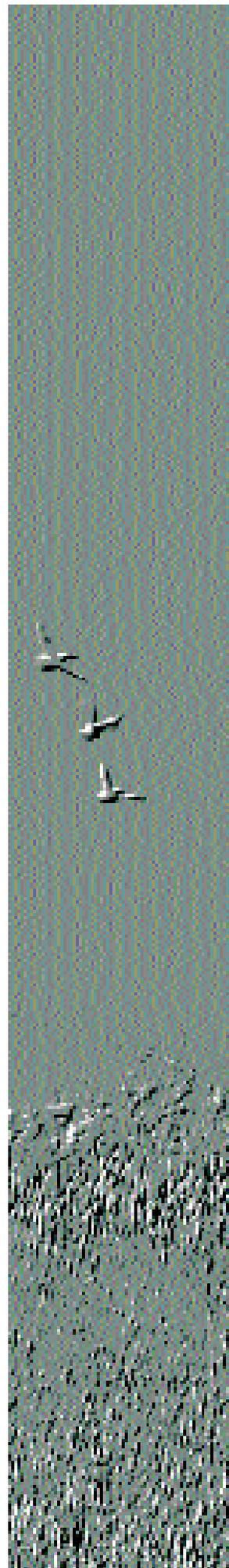
There are myriad issues related to soils that are important to address when considering a comprehensive management approach for the Wash. To ensure success, these issues must be addressed prior to implementation of vegetation restoration and enhancement activities.

A more detailed discussion on soils within the Wash can be found in Appendix 10.1.

Vegetation

Existing Vegetation Communities and Acreages

Vegetation communities in the Wash are important for many reasons. They serve as habitat for fish and wildlife, they act as a filter by removing pollutants from the water, they slow erosion by establishing roots that anchor the soil and they provide a recreational opportunity for local residents.



A vegetation survey conducted in 1994 by the Southwest Wetlands Consortium identified nine distinct vegetative communities within a 5,331 acre study area of the Wash, extending from Desert Inn Road to Lake Las Vegas. The nine vegetation types include: emergent wetland, strand, common reed, salt cedar, alkali, disturbed, upland, xeroriparian, and atriplex. Detailed descriptions of these plant communities, estimated acreage of each and their relative value to wildlife are provided in the Final Program Environmental Impact Statement (EIS) for the Clark County Wetlands Park (Southwest, 1998b).

Total acreage of wetland vegetation along the Wash, from Desert Inn Road to Lake Las Vegas, was calculated by SNWA in October 1999 using aerial photos taken in October 1998; however, the data has not been ground-truthed and is considered preliminary (SNWA, 1999). These acreage calculations provide rough estimates of the amount of vegetation that existed along the Wash in 1998, and are illustrated in Table 10.1. Even fewer wetlands are thought to exist in the Wash today due to the July 8, 1999, flood event that widened the Wash channel by 300 feet in some places and changed several vegetation communities.

Encroachment of Non-Native Vegetation

Most of the plant life found in the Wash today is non-native vegetation that is interspersed throughout various native vegetation communities. The non-native species currently dominating the Wash is salt cedar (*Tamarix chinensis*) (Southwest, 1998b). Salt cedar, or tamarisk, an aggressive exotic, is a phreatophyte that creates thick monocultures, exhibits very little diversity in height or composition and provides less suitable habitat for wildlife living in the Wash than does native vegetation.

The amount of salt cedar in the Wash has increased dramatically in the last 23 years. In 1975, the USBR determined that there were approximately 360 acres of salt cedar, or 20 percent of total vegetation in the Wash (Table 10.1). In 1998, SNWA estimated about 1,000 acres of salt cedar, or about 80 percent of total vegetation. Because of the increasing acreage of salt cedar and other non-native species in the Wash, and the resulting loss and decline of native vegetation, suitable habitat loss for plants and animals within the Wash is a concern.

Goals of Vegetation Enhancement

The Clark County Wetlands Park Master Plan estimates that 160 acres of wetlands will be restored, enhanced or created in the Wash through development of 14 erosion control structures. The structures are expected to promote the establishment of native wetland and riparian vegetation species upstream of each structure by pooling water and thus reducing the loss of wetlands to continued channel erosion. Riparian communities and



Vegetation Type	1975	1985	1995	1998
	(USBR)	(USBR)	(SWC)	(SNWA)
Mixed Scrub / Atriplex / Saltgrass / Mesquite	772	809	63	23
Reed Marsh / Common Reed	54	163	290	160
Mixed Marsh / Cattails / Emergent / Hydroriparian	529	195	65	16
Thistle / Smotherweed / Annuals / Alkali / Strand / Xeroriparian	67	95	74	106
Total (Wetland Vegetation)	1,422	1,262	492	305
Salt cedar (minimum 80% cover)	360	579	757	1,021
Total (Wetland Vegetation and Salt cedar)	1,782	1,841	1,249	1,326
Disturbed / Barren	148	440	174	112
Open Water	23	36	2	18
Total Acreage	1,953	2,317	1,425	1,456

Table 10.1 - Historical acreage of wetland vegetation in the Wash (U.S. Bureau of Reclamation, 1987; Southwest, 1995; SNWA, 1999).

increased diversity within the Wash are the desired results (Southwest, 1995). In addition to the 160 acres, the Final Program Environmental Impact Statement (EIS) for the Park estimates that 130 acres of riparian habitat (i.e., wetlands) will be enhanced (Southwest, 1998b). The master plan and EIS are specific to the Park's boundaries.

Several vegetation principles are proposed in the "Wetlands Mitigation and Riparian Enhancement Plan." These include items such as creating open water habitat, modifying plant communities, and wetlands monitoring and management. The Wetlands Mitigation and Riparian Enhancement Plan also outlines objectives of mitigation, guidelines for riparian enhancement, ecological management principles and planting design guidelines (SWCA, 1995). These same vegetation restoration and enhancement principles should be applied to all wetlands within the entire Wash.

Wetland restoration or creation without hydrologic design normally fails and, for this reason, hydrology must be carefully considered when enhancing vegetation within the Wash. The planning process may determine that a minimum daily flow would be beneficial to meet and sustain the needs of the wetlands park. Other hydrologic factors that will need to be taken into account include water depths, velocity, hydroperiod, salinity, nutrient levels, sedimentation rates, levels of toxins and other chemicals, etc. (Kusler, 1990). Once vegetation is fully established, water flowing into the Wash that will be used by wetland vegetation is estimated to be a maximum of 10,600 afy (Southwest, 1995). As discussed in Chapter 6, Erosion and Stormwater, establishment of significant acreages of wetland vegetation will need to be located off-stream or outside of the Wash channel.



Fish and Wildlife

The composition of the fish and wildlife community in the Wash has varied dramatically since the early 1900s, concurrent with changing physical and floral characteristics. Currently, the Wash supports a relatively diverse avian community, typical of riparian corridors in the east Mojave Desert (Southwest, 1998a; SWCA, 1999).

Although comprehensive surveys for mammals, reptiles, amphibians and fish have not been conducted in and along the Wash, there are some 72 species that are likely to occur (Southwest, 1998b). However, given the

Wetlands provide food and shelter for a variety of wildlife, including more than 20% of all threatened and endangered species.

Species	Federal Status	CCMSHCP Designation
Southwestern willow flycatcher	Endangered	Covered
Yuma clapper rail	Endangered	Watch List
Desert tortoise	Threatened	Covered
American peregrine falcon	Delisted	Covered
Bald eagle	Proposed for Delisting	Watch List
Long-eared myotis	Species of Concern	Covered
Arizona Bell's vireo	None	Covered
Blue grosbeak	None	Covered
Phainopepla	None	Covered
Summer tanager	None	Covered
Vermilion flycatcher	None	Covered
Yellow-billed cuckoo	None	Covered
Silver-haired bat	None	Covered
Banded gecko	None	Covered
Desert iguana	None	Covered
Great Basin collared lizard	None	Covered
Sidewinder	None	Covered
Western red-tailed skink	None	Covered
Relict leopard frog	None	Covered

Table 10.2 - Species covered by the CCMSHCP and/or Federally listed that could potentially occur in the Park's study area (Southwest, 1998b; RECON 1999).

abundance of salt cedar and the level of disturbance that has occurred in the area, it is not likely the populations of native species are robust. Table 10.2 lists species that are Federally listed and/or covered by the Clark County Multiple Species Habitat Conservation Plan (CCMSHCP) that could potentially inhabit the Wash.

Bird Surveys

During the summer of 1998, SWCA conducted surveys in and along the Wash for the southwestern willow flycatcher. The surveys resulted in the



identification of two migratory willow flycatchers, a Yuma clapper rail, and a migratory yellow-billed cuckoo (Southwest, 1998a). During the summer of 1999, SWCA conducted surveys again and found none of the above mentioned species (SWCA, 1999).

The results of these two survey efforts suggest that although there may not currently be resident populations of these high-priority species, populations may become established given the proper habitat conditions. Additional biological surveys and research are required to better characterize the Wash ecosystem.

Razorback Sucker

The razorback sucker (*Xyrauchen texanus*), Federally listed as endangered, has been identified as occurring in the Las Vegas Bay (BIO/WEST, 1999). Critical habitat for the razorback sucker includes Lake Mead to the full pool elevation (USFWS, 1993). The razorback sucker has the potential to occur within the lower portion of the Wash, below Lake Las Vegas, and therefore has the potential to be affected by management activities planned for the Wash. In the future, the Environmental Resources Study Team and/or the Las Vegas Wash Management Entity will address activities that have the potential to affect the razorback sucker.

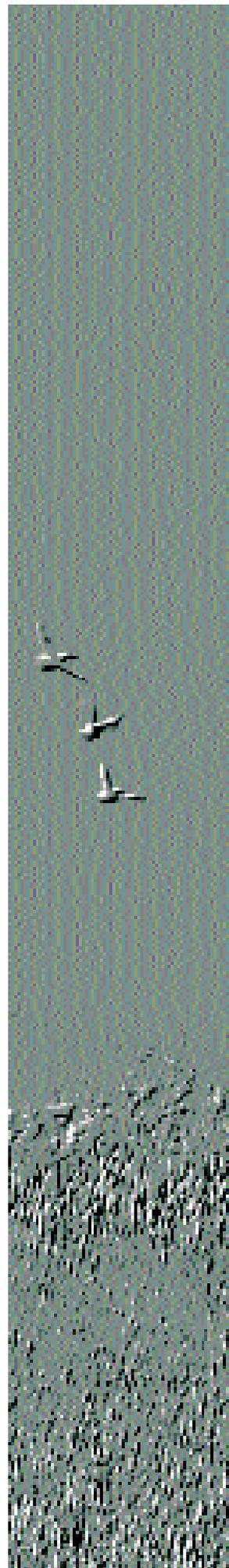
Role of the CCMSHCP in the Wash

From Table 10.2, it is apparent that the Wash presents significant opportunities to benefit a number of sensitive, threatened and endangered species of wildlife. With this, the Wash is able to play an important role in implementation of the CCMSHCP and the Lower Colorado River Multi-Species Conservation Program by providing alternatives for implementation of conservation actions. By cooperating and integrating activities, these efforts can benefit more species over a larger geographic area and thus achieve higher levels of success relative to native species.

For example, development of the Park will provide opportunities for the incorporation of conservation measures that would complement the CCMSHCP. During the first two years of the CCMSHCP, Clark County Parks & Recreation (CCP&R) will receive funding from the CCMSHCP specifically for implementation of conservation activities that provide benefits to listed and other species included in the CCMSHCP. This funding will be contingent upon CCP&R matching the funding with contributions from other sources.

Enhancing Native Biodiversity

The Wash currently exists in a degraded state as a result of the invasion of salt cedar, hydrologic and anthropogenic disturbances. Efforts to reduce



the level and frequency of disturbance and increase the diversity of habitats in and along the Wash will undoubtedly enhance native biodiversity. Nevertheless, disturbance is a natural process in riparian communities and should therefore be integrated into the effort when planning stabilization of the Wash and/or erosion control structures.

The general goal for fish and wildlife in the Wash should be to enhance native biodiversity by providing sufficient habitat to promote the establishment of source populations of resident species and encourage visitation by migratory species. In order to accomplish this goal, vegetation enhancement efforts must consider the habitat requirements of target species. In addition, it will be important to identify and mitigate potential sources of stress (i.e. contaminants, feral predators, nest parasites, off-highway vehicles). Research and monitoring will play a major role in the successful management of fish and wildlife resources in the Wash.

Development of a Long-Term Fish and Wildlife Management Plan is discussed below under Recommended Actions (Action 1).

Cultural Resources

A wide range of cultural resources can be found within the boundaries of the Park. Vital natural resources have drawn humans to the Wash for thousands of years. More than 50 archaeological sites have been recorded along the Wash, including the remains of prehistoric resource procurement camps and villages where plants, animals and tool materials were collected and used. From the Desert Archaic peoples to the Anasazi, Southern Paiutes and Patayan, Native Americans have valued the Wash for its abundance. Early explorers traveled this important corridor between the Colorado River and the Valley; remains of historic ranches can also be found there.

These resources present a number of possibilities for research, historic preservation, interpretation and education. The Park provides an opportunity to preserve the archaeological, biological and water resources as a “cultural landscape.” In a landscape, the importance of the area is derived from its natural resources. Interpretation of past and present uses as a wetland area provides an array of educational opportunities. However, integral to this approach is the early identification and protection of any cultural resources present.

Section 106 of the National Historic Preservation Act relates to projects affecting archaeological and historic resources and will be applicable to activities in the Wash during the planning and implementation of the Park. Prudent planning for this eventuality is recommended which will result in cost and time savings. An important action that will allow Park planning and implementation to proceed in a more efficient manner are proposed under the Recommended Actions section (Action 3).

An anthropogenic disturbance is a disturbance resulting from human activities.



Recommended Actions

The objective of the Team is to protect and enhance environmental resources within the Wash. In order to accomplish this, the Team developed the following five recommendations.

Action 1: Develop Long-Term Management and Monitoring Plans

Entities: LVWCC Member Agencies

In order to establish and coordinate monitoring efforts within the Wash, the following management and/or monitoring plans are recommended for development and implementation.

Long-Term Vegetation Restoration and Enhancement Plan

Mitigation measures proposed in the “Wetlands Mitigation and Riparian Enhancement Plan” (SWCA, 1995) include items such as creating open water habitat, modifying plant communities, and wetlands monitoring and management. The Plan also outlines objectives of mitigation, guidelines for riparian enhancement, ecological management principles and planting design guidelines.

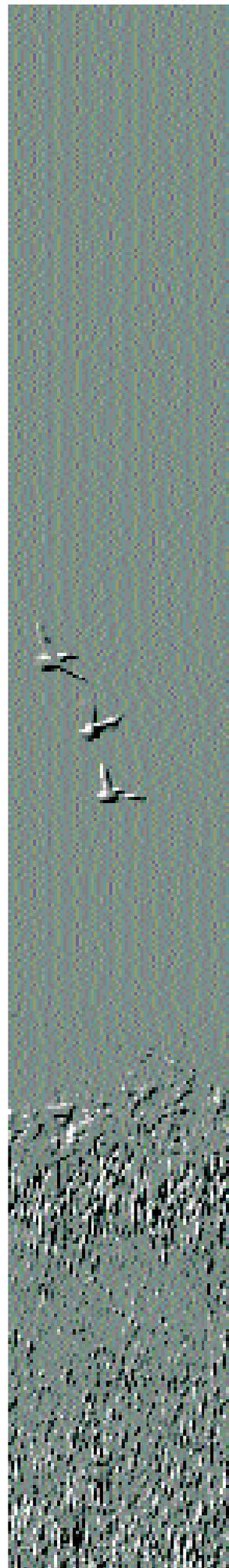
These same vegetation restoration and enhancement principles should be applied to all wetlands within the entire Wash. Additionally, there should be consideration of hydrology when enhancing vegetation within the Wash. Water depths, velocity, hydroperiod, salinity, nutrient levels, sedimentation rates, levels of toxins and other chemicals, etc., should all be taken into account.

Long-Term Fish and Wildlife Management Plan

In order to effectively manage the fish and wildlife resources of the Wash, it will be necessary to identify the biological baseline and establish specific biological goals. In addition, a particular emphasis should be placed on research and long-term monitoring of the fish and wildlife community. The information generated from this effort will be critical to future planning and implementation activities relative to all environmental resources in the Wash.

To guide the implementation of conservation projects and effectively address information needs required for successful management of the fish and wildlife resources in the Wash, it is recommended that a Long-Term Fish and Wildlife Management Plan be developed. This plan should:

- 1) Identify specific biological goals.
- 2) Establish a process for gathering baseline information.



- 3) Identify sources of disturbance and stress to the fish and wildlife community.
- 4) Develop a monitoring program.
- 5) Identify research needs.

Development and implementation of this plan will help to ensure long-term success of environmental resource management activities within the Wash.

Long-Term Management Plan for Salt Cedar and Other Non-Native Invasives

As discussed earlier, the issue of encroaching non-native invasive plants such as salt cedar in the Wash is a concern. To address this issue, the Team developed an outline for a Long-term Management Plan for Salt Cedar and other Non-Native Invasives.

Development and implementation of this plan will establish guidelines for future management of non-native invasive plants in the Wash.

Long-Term Soils Monitoring Plan

As discussed earlier, knowing more about the soils that exist in the Wash is necessary in order to adequately and successfully plan vegetation restoration projects. For example, salinity concentrations of soils in the Wash should be mapped, and the types of salts (e.g., minerals) present in the soils should be characterized.

To ensure success, issues such as soil salinity, soil moisture, compactability, etc., must be addressed prior to implementation of several related, on-the-ground activities within the Wash. Development of a Long-Term Soils Monitoring Plan is recommended to accomplish this, as well as ensure the success of vegetation restoration and enhancement activities within the Wash. The proposed “Sediment Quality Monitoring Program,” included in the Final Program EIS for the Clark County Wetlands Park, may be used as support for development of the Long-Term Soils Monitoring Plan.

LONG-TERM MANAGEMENT PLAN FOR SALT CEDAR and NON-NATIVE INVASIVES

OUTLINE

Introduction

- Purpose of Plan
- Brief History of Vegetation in Las Vegas Wash
- Brief Life History of Salt Cedar

Existing Conditions

- Description of Wash
- Acreages/Maps
- Objectives/Goals
- Revegetation/Enhancement Efforts
- U.S. Fish and Wildlife Service Habitat Requirements

Eradication Methods and Protocol

- Mechanical
- Chemical
- Biological
- Fire
- Case Studies in Southwest
- Opportunities and Constraints (geographically specific)
- Preventing Reinvasion

Recommendations

- Eradicate and Remove (when, where, how, priority sites)
- Replant Native Species
- Schedule
- Cost Analysis
- Monitor Progress and Evaluate Results
 - 1) Vegetation, and 2) Use as Habitat by Wildlife
- Long-Term Management

Plan Amendments/Future Review



**LONG-TERM
WATER QUALITY
MONITORING PLAN**

SPECIFIC PARAMETERS

General

- pH
- total dissolved solids
- total and fecal coliforms
- nitrate as N
- alkalinity

Metals

- arsenic
- cadmium
- chromium
- copper
- lead
- manganese
- mercury
- nickel
- selenium
- silver
- zinc

Other

- pesticides (including organochlorines, and organophosphates)
- herbicides
- perchlorate

Long-Term Water Quality Monitoring Plan

As already discussed in several chapters in this document, a “Long-Term Water Quality Monitoring Plan” should be developed that will characterize background water quality throughout the Wash ecosystem and determine the effectiveness of the wetlands to improve general water quality. Contaminant accumulation and transport within the Wash are issues of particular interest.

A water quality monitoring plan is currently being developed as part of the Environmental Assessment process currently under way for construction of the Clark County Wetlands Park Nature Center. This plan should be part of the “Long-Term Water Quality Monitoring Plan” for the Wash.

Further Actions Required

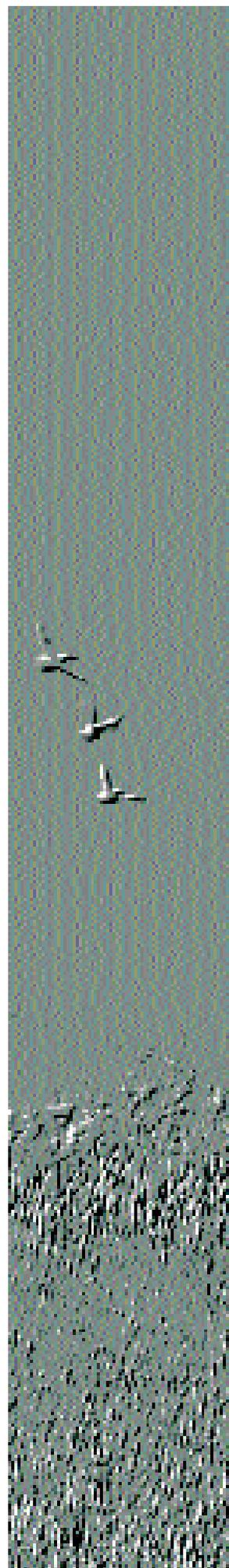
The following actions are recommended to further coordinate the efforts of each long-term management and/or monitoring plan:

- Identify agencies responsible for development and implementation of each monitoring plan.
- Assist Clark County with development and implementation of monitoring plans required as mitigation commitments for the Clark County Wetlands Park.
- Determine the feasibility of developing a long-term adaptive document to encompass all monitoring plans in the Wash, including monitoring objectives, study parameters, responsible agencies, data sharing guidelines, correlations between monitoring plans, etc.

Action 2: Conduct Additional Research

Entities: Clark County Comprehensive Planning, Clark County Parks & Recreation, Southern Nevada Water Authority, U.S. Bureau of Reclamation, U.S. Fish & Wildlife Service, U.S. Geological Survey, University of Nevada Las Vegas

In order for the Team to understand the environmental resources that have or are being addressed through past or existing research efforts, each entity involved with the Wash was contacted and a list of past, current and planned research within the Wash was developed (Appendix 10.2). By developing this list, the Team was able to recognize that many “gaps” in



scientific knowledge exist regarding environmental resources in the Wash. It is recommended that these research needs be further identified and defined in order to implement pertinent research projects for the Wash in the future.

Standardized Methods

Given potential high costs of demonstration projects, the greatest potential for filling the gaps in scientific knowledge may lie with careful monitoring of selected types of new restoration or creation projects. Standardized methods for project evaluation and project monitoring are recommended to facilitate determination of “success” and comparisons between systems and approaches (Kusler, 1990).

Bio-Accumulation of Pollutants and Toxins in Wildlife

Recent concerns have indicated that certain tributaries to the Wash may contain concentrations of metals (e.g., selenium) and other parameters that could have detrimental impacts to wildlife that rely on the Wash as primary habitat. Developing a monitoring plan that incorporates this concern is critical to understanding the complete ecological cycle that occurs throughout the Wash. Several items to consider when developing this plan include: 1) species that currently use the Wash as habitat, 2) the potential for species to migrate to the Wash, 3) the background health of species currently using the Wash, 4) population estimates monitored over time, 5) understanding the trophic cycle and 6) identification of water quality parameters in the Wash that may present a concern.

Action 3: Preserve and Address Cultural Resource Issues

Entities: Clark County Comprehensive Planning, Clark County Parks & Recreation, Las Vegas Wash Management Entity, U.S. Bureau of Reclamation

Cultural resources in the Wash present a number of opportunities for research, historic preservation, interpretation and education. Although much is known about certain specific cultural resources situated there, only a small portion of the overall area has been inventoried. Therefore, two steps are proposed to identify and to manage extant archaeological resources appropriately.

ENVIRONMENTAL RESOURCES

RESEARCH NEEDS

- Vegetation Requirements
- Contaminant Accumulation and Transport
- Ability of Wetlands to Treat and/or Polish Flows
- Conduct water quality monitoring in the Wash
- Minimum Amount of Water Required to Maintain Desired Vegetation Communities
- Minimum Amount of Water Required to Manage for Wildlife Habitat Values
- Management and Movement of Water within the Wash

ENVIRONMENTAL RESOURCES

PROJECT STATEMENT

- Environmental Resource Issue
- Problem Statement
- Existing Information
- Alternative Solutions
- Recommended Actions(s)
- Permits Needed
- Funds Needed
- Agency Involvement Required
- Implementation Requirements
- Benefits of the Action



Update Class I Inventory

A cultural resource overview (Class I Inventory) was written for the wetlands park (Seymour 1995). Since then, several small inventories have been completed and new sites have been identified, but still much of the area remains unsurveyed. As an efficient management tool, the Class I Inventory should be updated to reflect this current knowledge as well as condition of the identified resource.

Conduct Class III Surveys

Identification of unknown resources and evaluation of previously recorded sites is proposed. An on-the-ground Class III archaeological survey should be conducted to provide information as to location, types and number of resources present. The inventory will also provide information for evaluation for significance by the State Historic Preservation Office. This is a case where advance preparation is beneficial as only those sites deemed significant will need to be addressed in the event of future Section 106 issues, during the planning and interpretation stages.

Action 4: Identify Funding Needs

Entities: Funding Study Team, Las Vegas Wash Management Entity

In order to anticipate the funding required to sustain and enhance wetlands and habitat within the Wash, the following is recommended:

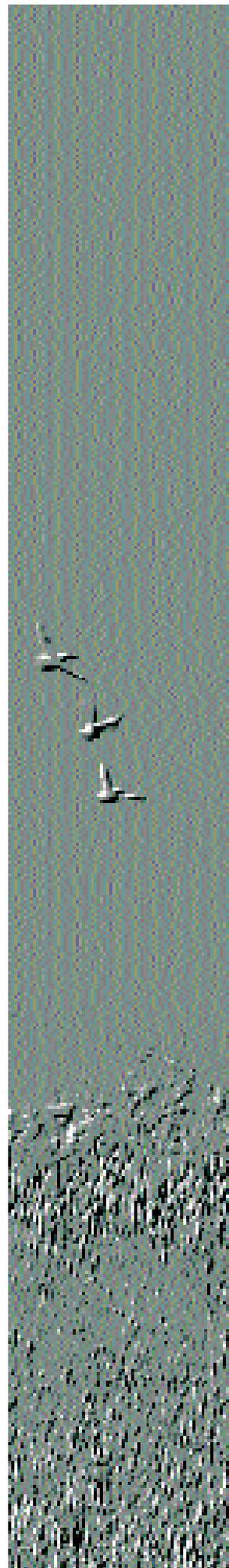
- Develop a comprehensive list of funding needs for environmental resource projects.
- Assign cost estimations to each funding need identified.
- Determine project priorities and address scheduling needs.
- Coordinate with the Funding Study Team for funding options.

Action 5: Facilitate Interagency Coordination to Ensure Projects are Implemented

Entities: LVWCC Member Agencies

In order to facilitate a partnership between the various agencies involved with the Wash, and continue to achieve the objectives of the coordination committee and the Team, the following is recommended:

- Evaluate environmental resource issues of concern in the Wash, prioritize them for action and develop project statements that serve as recommended actions and alternatives to the resource issues.



- Exchange technical support, review and input on projects occurring in the Wash among all relevant and affected entities involved in the Wash.
- Coordinate all work and projects to be conducted within the Clark County Wetlands Park boundaries with Clark County Parks and Recreation.

Appendices

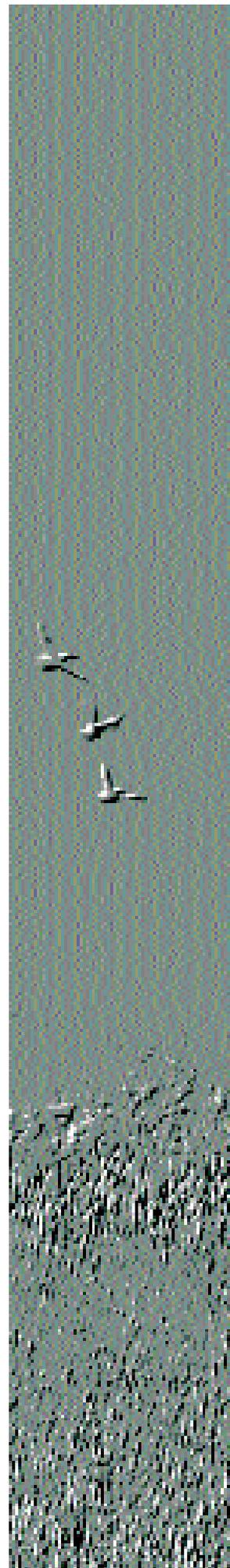
- 10.1 Soils in Las Vegas Wash (Summary by Doug Merkler, Natural Resources Conservation Service)
- 10.2 Research Projects Relating to Las Vegas Wash

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