

The Jordan River Natural Conservation Corridor Report

**Prepared by the National Audubon Society
for the Mitigation Commission and the
U.S. Fish and Wildlife Service**

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CHAPTER 1

OVERVIEW OF THE JORDAN RIVER CORRIDOR AND DEVELOPMENT OF THE REPORT

Setting the Scene The Jordan River starts at Utah Lake and flows into the Great Salt Lake.¹ The River is approximately 44 miles long, and travels across three counties and through fifteen different communities. In addition, several state and federal agencies are landowners or have programs along the River.

The Jordan River system is a remnant of ancient Lake Bonneville, and functions as a conduit for Wasatch Mountain water reaching the Great Salt Lake. With the decline of Lake Bonneville, beginning approximately 16,000 years ago, the Jordan River emerged by snaking its way through unconsolidated lake sediments enroute to the shrinking Great Salt Lake. As the Great Salt Lake diminished, the Jordan River lengthened, and was enlarged by the canyon tributaries.

Eventually, the River developed a natural meander corridor and associated floodplain

¹ Currently, the Jordan River enters the Great Salt Lake at Farmington Bay. Around 10,000 years ago the Jordan River entered the Great Salt Lake northeast of Saltair and over time has moved towards its current entry into Great Salt Lake. Since the Surplus Canal and its offshoots provide water to this old river delta system, this area is considered part of the Jordan River system.

and created numerous oxbows, marshes, sloughs, and pothole ponds. These riparian zones replaced the lake habitat of Lake Bonneville, and provided a home for a diverse community of wildlife

However, since settlement, the River has been significantly degraded by human impacts and many of its natural values lost. The River has been regarded as a convenient dumping ground and in the past deemed a less desirable place to live and recreate. Nevertheless, given the River's strategic location between Utah Lake and the Great Salt Lake, as well as an oasis between the Wasatch and Oquirrh Mountains, it is still an important corridor for the support of avian wildlife.

The Need for A Report To bring attention to the history, current condition and potential of the Jordan River corridor to provide wildlife habitat, the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission) and the U.S. Fish and Wildlife Service (Service) initiated the development of this Report.²

² The Mitigation Commission has authority under the 1992 Central Utah Project Completion Act, Section 311 (c), to acquire wetlands on the Jordan River. In the Commission's 2000 Mitigation and Conservation Plan, planning for natural areas along the Jordan River is included as a program element. The U.S. Fish and Wildlife Service has responsibility for the Federally-protected trust resources of migratory birds. The agency is administering a program that targets migratory birds along the Jordan River. Funds for the program are derived from a \$2,300,000 damage settlement that was awarded in compensation for injuries to Federally-protected trust resources caused by contamination of the Jordan River Corridor from the Sharon Steel and Midvale Slag Superfund sites.

To that end, the Report:

Assembles existing information on the natural values of the Jordan River.

Uses this information to identify areas along the River that still provide important wildlife habitat.

Recommends actions that can be taken to maintain and promote the natural values of the River, as well as adjoining wetlands and upland habitat.

The Report Itself Following this introductory chapter, Chapter 2 outlines historic and current conditions along the river and issues raised by current conditions and Chapter 3 contains recommendations to address the issues. Specifically:

Chapter 2 identifies conditions of natural resources along the River before European settlement. This gives us a baseline against which we can measure changes that have occurred with settlement. Chapter 2 also contains information on what resources have been lost because of settlement and where the system is headed if no changes are made.

Chapter 3 identifies nine issues of concern, based on information provided in Chapter 2. This chapter also contains recommendations to address the issues.

A Sneak Preview The heart of the Plan is a recommendation to create a network of natural areas along the River (see Recommendation A1: Establish a Natural Conservation Corridor). Areas are already acquired that form the seed of this system.

Map 1.1 illustrates both the strategic location of the Jordan River and some of these areas.³

The Desired Future Condition It is hoped that this Report will inspire an interest in preserving what is left of the natural values of the Jordan River. Both the Mitigation Commission, and the Jordan River Sub-Basin Watershed Council and Salt Lake County Council of Governments, have separately developed statements that articulate a desired future condition for the Jordan River.⁴ Based on those visions,

³ The Jordan River Natural Conservation Corridor brochure includes a color version of Map 1.1. See Appendix F, page 2 for information on how to obtain the brochure.

⁴ The following vision statement was adopted by the Jordan River Sub-Basin Watershed Management Council (3/17/97) and the Salt Lake County Council of Governments (4/3/97):
“The Jordan River Corridor is a valuable and unique open space link between Utah Lake and the Great Salt Lake. We believe in a cooperative and coordinated approach to management of the corridor which promotes open space opportunities for restoration, conservation, and enhancement of the following systems or values in the interest of protection, public health, safety and welfare:

Ecological systems which include diverse wildlife, aquatic and riparian communities.

Water quality and in-stream flows which fully support the beneficial uses of the river, including the corridor’s ecological systems, in-stream recreation and aesthetics, domestic water supply and irrigation.

Accessible recreation and educational opportunities.

Flood conveyance capacity to safely store and transport flood waters within the river corridor.

combined with what has been learned during development of this Plan, the following desired future condition is offered as a realistic future if the recommendations of this Plan are implemented:

Significant acreages of wetland, native vegetation and wildlife habitat will be professionally managed in an integrated manner in perpetuity. Areas that are primarily for human use such as trails, golf courses and parks will be managed, to the extent possible, to complement the wetlands, native vegetation and wildlife habitat of the natural conservation corridor. A minimum stream flow will be maintained for the benefit of fisheries, wildlife and people.

Public and private community partnerships that ensure the successful long-term operation and management of the Jordan River Corridor.

Land uses which complement and support the above systems.”

The following is the Desired Future Condition for the Jordan River Watershed as stated in the Utah Reclamation Mitigation and Conservation Commission Plan - July 2000 Plan:

“The Jordan River meanders through the Utah and Salt Lake Valleys on its journey from Utah Lake to the Great Salt Lake. Visitors enjoy a visually-pleasing landscape with urban sights and sounds moderated by a stable and healthy riparian and wetland system. These systems provide fish and wildlife habitat, ecological food chain support, recreation opportunities, flood and pollution control and river stability. The integrity of both the function and value of these systems has been conserved, enhanced and protected. Recreation opportunities along the Jordan River emphasize educational and interpretive activities.”

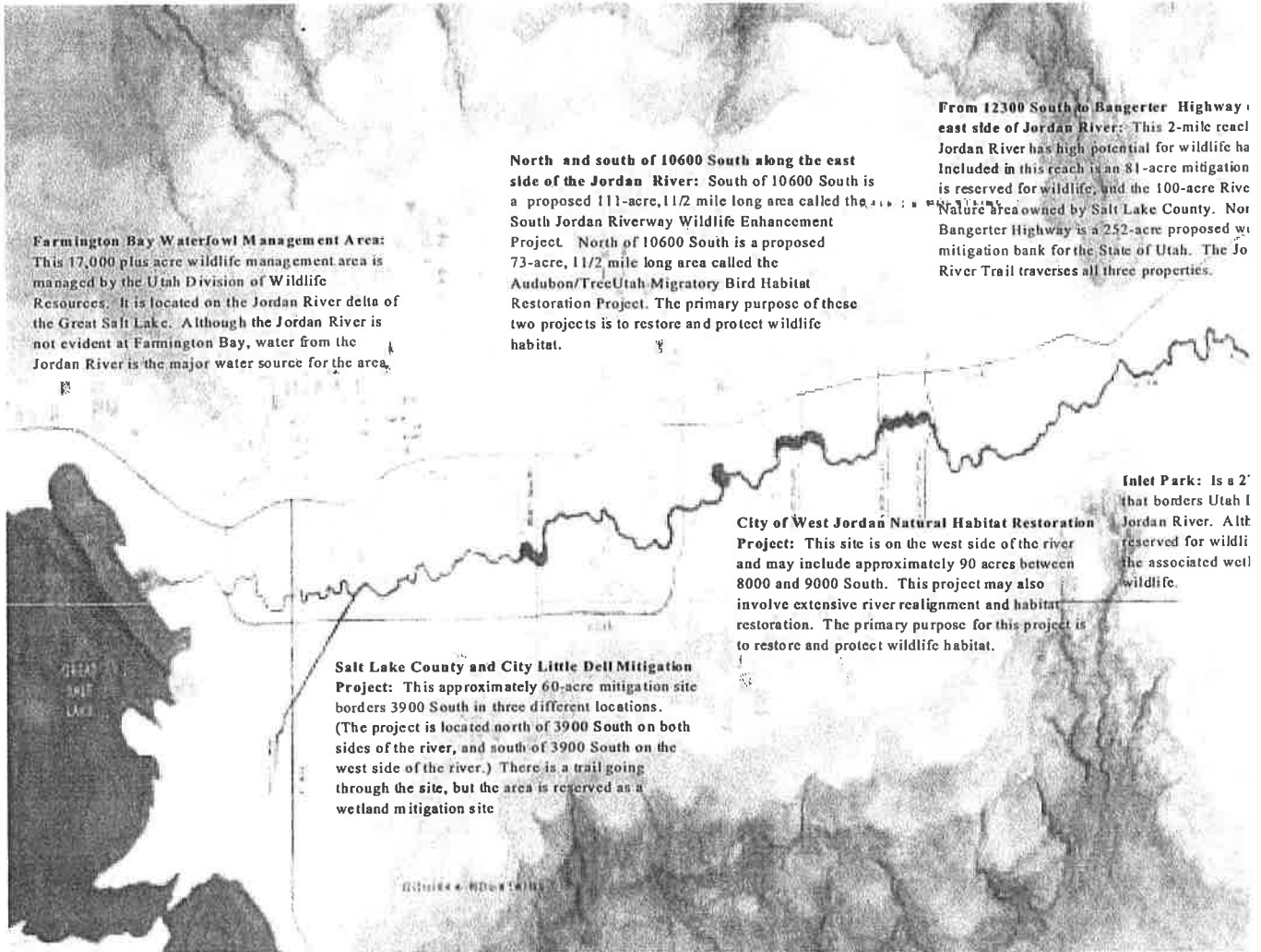
Given the complex land ownership pattern along the Jordan River that includes federal, state, local government and private interests, only through the combined efforts of multiple partners implementing this Report can this vision can be achieved.

Key Participants in Development of the Report

This Report was developed through a cooperative agreement among the Mitigation Commission, U.S. Fish and Wildlife Service, National Audubon Society and, Salt Lake County Public Works. A significant staffing contribution was also made by the Jordan River Environmental Education Program through Great Salt Lake Audubon.

Additionally, the Jordan River Sub-Basin Watershed Council served as a technical steering committee for the Plan.

The public involvement and technical development aspects of the Plan, including a list of individuals involved in plan development, are described in Appendix F and G, respectively.



Farmington Bay Waterfowl Management Area: This 17,000 plus acre wildlife management area is managed by the Utah Division of Wildlife Resources. It is located on the Jordan River delta of the Great Salt Lake. Although the Jordan River is not evident at Farmington Bay, water from the Jordan River is the major water source for the area.

North and south of 10600 South along the east side of the Jordan River: South of 10600 South is a proposed 111-acre, 1 1/2 mile long area called the South Jordan Riverway Wildlife Enhancement Project. North of 10600 South is a proposed 73-acre, 1 1/2 mile long area called the Audubon/Tree Utah Migratory Bird Habitat Restoration Project. The primary purpose of these two projects is to restore and protect wildlife habitat.

From 12300 South to Bangerter Highway, east side of Jordan River: This 2-mile reach Jordan River has high potential for wildlife habitat. Included in this reach is an 81-acre mitigation reserved for wildlife, and the 100-acre River Nature area owned by Salt Lake County. North of Bangerter Highway is a 252-acre proposed mitigation bank for the State of Utah. The Jordan River Trail traverses all three properties.

City of West Jordan Natural Habitat Restoration Project: This site is on the west side of the river and may include approximately 90 acres between 8000 and 9000 South. This project may also involve extensive river realignment and habitat restoration. The primary purpose for this project is to restore and protect wildlife habitat.

Inlet Park: Is a 27-acre park that borders Utah 1 Jordan River. Although reserved for wildlife, the associated wetland habitat is also protected.

Salt Lake County and City Little Dell Mitigation Project: This approximately 60-acre mitigation site borders 3900 South in three different locations. (The project is located north of 3900 South on both sides of the river, and south of 3900 South on the west side of the river.) There is a trail going through the site, but the area is reserved as a wetland mitigation site.

CHAPTER 2

PHYSICAL, BIOLOGICAL AND SOCIAL ASSESSMENT OF THE JORDAN RIVER CORRIDOR

This chapter identifies conditions of natural and human resources along the River before and after European settlement. Resource areas are categorized into physical, biological and social domains. Under physical domain, natural resources discussed include stream channel and flood plain structure, hydrologic regime, and water quality. Under biological domain, terrestrial wildlife, avian wildlife, fisheries and vegetation are discussed. Under social domain, human use and management of the river corridor are discussed.

For each resource, a pre-European settlement condition is identified that provides a baseline against which we can measure changes that occurred with settlement. These changes are identified in the sections titled "Changes From Pre-European Settlement Leading to Current Conditions." In order to assess impact of these changes, information is also provided that identifies trends and risks to natural values if current conditions continue.

PHYSICAL DOMAIN

HYDROLOGIC REGIME

Pre-European Settlement

The Jordan River is approximately 44 miles long and flows north from the outlet of Utah Lake to the Great Salt Lake. The Jordan River/Utah Lake Basin includes all of the rivers and streams tributary to Utah Lake and numerous tributary mountain streams that drain directly into the Jordan River. The primary tributary streams flowing into the Jordan River are Willow Creek, Bingham Creek, Little Cottonwood Creek, Big Cottonwood Creek, Mill Creek, Parley's Creek, Emigration Creek, Red Butte Creek, and City Creek.

Utah Lake is a natural lake with a drainage area of approximately 2,950 square miles. Three main tributaries feeding Utah Lake are the Provo, American Fork, and Spanish Fork Rivers. Headwaters of these drainages are in the Uinta Mountains and Wasatch Mountains, respectively, and contain numerous small glacial lakes that serve as catchment areas for heavy snowfall and rain.

Because Jordan River is the only natural outlet from Utah Lake, river flows were largely influenced by fluctuating amounts of water flowing into Utah Lake, and into tributaries north of Utah Lake. Water amounts in both Utah Lake and the tributaries would fluctuate due to seasonal and cyclical variations in climatic conditions and weather patterns. Commonly, during the spring, the river would be at flood stage due to snowmelt in mountainous headwaters of the basin. Because of the large land area contributing flow to Utah Lake and the

Jordan River, it is likely during most spring seasons the river discharge exceeded channel capacity, and flowed onto the adjacent floodplain. This period of high water and floodplain inundation could have lasted for a few months. In addition, during years of high snowmelt floods, it is likely that the channel would either migrate significantly across the floodplain, or move to a new alignment. During the summer months, flows from Utah Lake would decline; however, flows in the Jordan River would remain slightly elevated due to groundwater discharge from adjacent floodplains returning to the river. During autumn, flow in the river would likely be low with the exception of brief periods of high flow resulting from late summer and autumn thunderstorms. In the winter, river flows would decline to their lowest levels; however, it is unlikely that the river went dry, except perhaps during periods of sustained drought.

In summary, the Jordan River, prior to European settlement, experienced a wide variety of flows on an annual and cyclical basis. Spring snowmelt floods likely inundated the floodplain for several months, followed by gradually declining flows through the summer and autumn. During times of high snow accumulation, significant alteration of the floodplain could have occurred as the river migrated across the floodplain, or moved to a new alignment. Thus, the flow regime ultimately dictated the structure of the channel and floodplain as the river adjusted to fluctuations in water and sediment discharge.

Changes from Pre-European Settlement Leading to Current Conditions

The first human impact that altered Jordan River's natural flow involved irrigation canal diversions for agriculture and milling. In 1872, a dam was built on the Jordan River (in the Narrows, see Map A2) to reclaim high water run-off of Utah Lake for irrigation purposes. Between 1853 and 1882, starting at the Narrows, four major canals were completed. These canals diverted water from the River to points throughout the Salt Lake Valley.

In 1892, Salt Lake City Engineer, A.F. Doremus, proposed that Utah Lake be taken as a water "source or base of supply" and that its capacity be increased by constructing a dam to store water. The Morse Decree of 1901 established use of Utah Lake as a storage reservoir. Eventually, a pump station at Utah Lake was constructed in 1902, with additional pumps added in 1905, 1907, and in 1911.

The dams and pumps were constructed to store high water run-off deemed wasted during peak flows, and to release it on a more regular and even flow basis. These projects sought to guarantee water delivery during cyclical droughts and to create a buffer against floods. However, irrigation and water supply diversions and dams significantly altered the natural flow regime by eliminating peak spring flows that are vital to maintaining a dynamic riverine system. This ultimately led to drying of the floodplain and inability of the river to migrate because of lowered annual peak flows. This in turn caused changes in the channel and floodplain and, most

significantly, loss of native riparian vegetation.

Today, average annual flow of the Jordan River at the Jordan Narrows, including all diversions to canals, is 308,000 acre-feet. Additional surface water inflow between Jordan Narrows and the Great Salt Lake averages 173,400 acre-feet from the Wasatch Range mountain streams and 4,400 acre-feet from Oquirrh Mountain streams (Utah Division of Water Resources, 1997).

No minimum flow requirements have been established for the Jordan River. In general Jordan River flow has been maintained in large part because of water rights held by public and private waterfowl management areas in the Jordan River Delta, and also because of irrigation return flows and natural reach gains, e.g., from springs (Utah Division of Water Resources, 1997)

Trends and Risks to Natural Values, if Current Conditions Continue

Trends The most predictable trend for future conditions is that the river will not frequently inundate the floodplain, and that channel alignment will largely remain unchanged. Local scour and deposition will continue, however major channel shifts are much less likely to occur. Thus, because of flow regime alterations, the river has lost ability to interact with the floodplain.

In the short term, flows in the Jordan River have been higher in the past few years for a variety of reasons (e.g., less water being diverted by irrigation companies, higher flows out of Utah Lake). It appears the Jordan River is now flowing at “bank full” capacity for several months of the year. If

this trend continues, it is possible groundwater levels on the adjacent floodplains will be elevated, and will experience less annual fluctuation. However, these effects will only extend a few tens to a few hundred feet away from the channel, and will not affect a significant portion of the floodplain. Thus, broad floodplain drying could be expected to continue in the future. Additionally, in the future it is unlikely that major diversions and dams will be modified, consequently, annual spring flow discharges will remain greatly reduced.

Risks The risk of continuing with current conditions primarily involves impacts to the floodplain. By eliminating annual flood flows, the channel is becoming deeply entrenched, and incapable of interacting with the floodplain. Thus, floodplains will continue to dry and be less capable of supporting native riparian vegetation.

STREAM CHANNEL AND FLOOD PLAIN STRUCTURE

Pre-European Settlement

Prior to European settlement, the Jordan River meandered extensively from Utah Lake to Great Salt Lake. In various stretches of River, the channel was braided, or developed oxbow channels and formed numerous islands. The River interacted closely with, and was well-connected to, the floodplain. Typically, the floodplain was narrow and confined in the area closer to the Narrows, where there is a steeper gradient, and dispersed or broadened out in the lower reaches of the River, creating a delta complex near the flat areas of the Great Salt Lake.

Utah Lake would have helped support a well-connected floodplain by moderating high flows and assuring a water supply after flooding. Additionally, numerous meanders would have slowed the flow of the river, allowing water to spread onto the floodplain and serve as a retention area. This meandering also decreased velocities and minimized scouring and entrenchment. Flooding of the river channel onto the floodplain would have been frequent.

Changes from Pre-European Settlement Leading to Current Conditions

The change from presettlement to current conditions can most easily be visualized in comparing aerial photos of the River taken in 1937 and 1990 (see Figures 2.1 and 2.2). These photos of the Jordan River at the present location of I-215 in Murrery show the loss of about a half-mile-wide corridor of wetlands to agricultural and industrial



Figure 2.1 Jordan River in 1937, future location of I-215 in Murrery



Figure 2.2 Jordan River in 1990, at I-215 in Murrery

development (Salt Lake County 1992). Channel stabilization work performed in the 1950's between 2100 South and 14600 South straightened the channel, which contributed to increased channel slope and consequently increased flow velocities and higher sediment transport rates. These factors acted to de-stabilize the channel bed and cause accelerated bank and bed erosion (Utah Division of Water Resources, 1997).

Flood control projects also changed the pre-settlement condition of the River. A flood control project on the Jordan River (authorized in 1946 and completed in 1961) excavated the channel and constructed levees along 8,000 feet of Jordan River from Mill Creek to the head of the Surplus Canal. In the 1980's the Jordan River was dredged in Utah County for flood control purposes.⁵

The result of flood control projects and straightening and dredging of the river channel is that the present-day channel and active floodplain of the Jordan River in most places are entrenched 6 to 10 feet below the historic floodplain. Although portions of the historic floodplain may become inundated during very large and infrequent flood events, it is not considered part of the active floodplain (see Figure 2-3).

Additionally, numerous bridges cross the River restricting the pre-settlement meander pattern in several ways: 1) the river must be armored and narrowed before and after the bridge because the bridges are sized for the 100 year flood not the meander pattern; and,

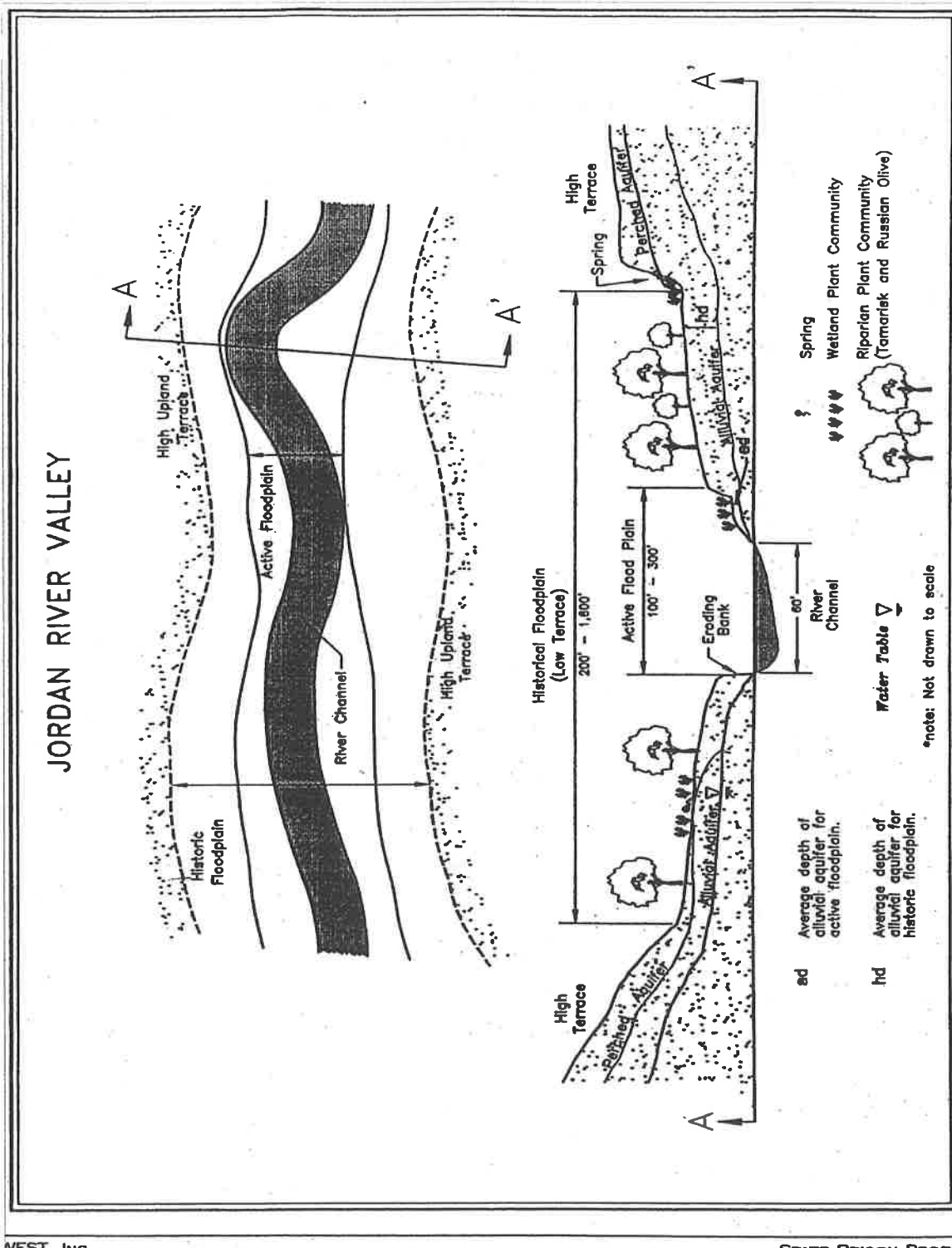
2) the more bridges on the river (there are 10 bridges along 30 stream miles), the shorter the distance between them, which shortens the distance the river has to meander.

Currently, there are projects to minimize continued channel degradation. Specifically, Salt Lake County, in cooperation with the U.S. Army Corps of Engineers, city governments and others, is proceeding with efforts to restore natural habitat along the Jordan River in 20 different locations. Much of this effort includes bank reshaping so that there is a gradual slope to the river rather than steep embankments, which accelerate erosion and sedimentation (United States Army Corps of Engineers, 2000).

There have also been administrative attempts to treat the river as a natural system. A study commissioned by Salt Lake County (CH2M Hill 1992) recognized the river inundated the floodplain during floods, and the channel had migrated across the floodplain, as river systems in dynamic equilibrium will do. It also recognized that structural measures (rip rap, dredging, channelization, etc.) were not effective flood control measures. Based on these conclusions, it was recommended that management within the Jordan River Meander Corridor (a zone within which the river channel may be expected to migrate within the next 100 years) should consist of non-structural measures. This management approach treats the river as a natural system, does not attempt to control it, and reduces risk to human property by avoiding hazardous areas. A Meander Ordinance was

⁵ *The 1984 Phase I Report - Utah Lake - Jordan River Flood Management Program* submitted to Salt Lake County and Utah County by CH2M Hill provides the details of this effort.

Figure 2.1 Geomorphic Features of the Jordan River Valley⁶



⁶ The source of this graphic is Bio/West 1998.

developed in 1994 based on this study, setting limits on the type of development and land uses within the designated corridor.

One section of the river from Utah Lake to around 12300 South has been least affected by encroachment and channelization, but suffers from dewatering in the winter (Utah Division of Water Resources, 1997).

Trends and Risks to Natural Values, if Current Conditions Continue

Trends The Jordan River floodplain is currently receiving significant pressure for commercial and residential development. In spite of Salt Lake County's Meander Ordinance, encroachment within the floodplain and development within the Meander Corridor has occurred.

Development is permitted in close proximity to the river because structural measures were employed to fix the channel in its current location. This was done on numerous sites without regard to the effects on upstream and/or downstream reaches of the river.

Risks If this straitjacketing of the river continues, there will be detrimental effects on the channel and floodplain structure. First, the river will, in spite of efforts to fix its location, attempt to maintain a state of dynamic equilibrium. In other words, it will attempt to adjust its channel shape and slope in response to changes in water and sediment moving down the channel. The manifestation of these changes could be down cutting of the river bed (because as the river becomes locked into its position and is prevented from migrating laterally, it will tend to scour its bed), bank erosion, channel filling, overbank flooding, or channel migration. All of these are natural reactions

of the river to localized restrictions; however, because of adjacent development, they will be viewed as hazardous.

The river channel will cease to be a natural river channel. It will become a rock-lined irrigation ditch. In addition, the natural floodplain will be lost. Without the ability of the river to naturally meander and periodically flow outside of its channel, the River will continue to down-cut and incise the channel, forcing the River to become further entrenched, and cause the water table to drain and drop. This will in turn cause the floodplain to dry out and impact support of wetland vegetation and the wildlife that rely on wetlands.

WATER QUALITY

Pre-European Settlement

Charlie Lockerbie, Utah's first noted ornithologist, grew up on the Jordan River, around 1700 South, in the 1890's. He wrote about his boyhood adventures in *Utah Audubon News*, 1949, in a series of articles called "Our Changing World." Lockerbie wrote about catching two to four pound trout on the Jordan River by 1700 South. While specific water quality data for pre-European settlement times are not available, this historical account provides anecdotal evidence that the Jordan River at one time supported a cold water fishery with low turbidity.

Changes from Pre-European Settlement Leading to Current Conditions

Water quality serves as a barometer of change in the Jordan River watershed. As human uses of the watershed increased there have been increased negative impacts to water quality. Silt loads in the Jordan River increased dramatically as a result of overgrazing in the mountain ranges and crop production in the valley. Raw sewage flowed into the Jordan River for nearly 100 years, until sewage treatment plants were built to serve most of the valley. The Jordan River also became contaminated by heavy metals, especially lead and arsenic, from mining operations in the mountains, 48 old smelter sites in the valley, and numerous other industrial activities. Tailings and slag from the United States Mining, Smelting, and Refining Company at Midvale lie directly in the old Jordan River channel (Dubois 1994).

The Utah Division of Water Quality classifies water bodies in the State as to type of water use. Currently, the Jordan River has the following classifications: 1) from Utah Lake to Little Cottonwood Creek Entrance in Murray Class 2B (secondary human contact -boating, wading, etc.), Class 3A (habitat maintenance for cold water game fish, water-related wildlife and food chain organisms), and Class 4 (agricultural-livestock and irrigation water); and, 2) from Little Cottonwood Creek entrance in Murray to Farmington Bay Class 2B and 4 as above and Class 3B (habitat maintenance for warm water game fish, water-related wildlife and food chain organisms.)

The Utah State Division of Water Quality recently completed intensive water quality monitoring on the Utah Lake and Jordan River sub-basins. The assessment, completed in June 1996, identified two areas of concern specifically for the Jordan River: the lower miles of the river and the river from Utah Lake to 6400 South.

The 1996 Assessment identified concerns regarding aquatic life on the Jordan River. Problems include heavy algal blooms caused by excessive amounts of nutrients, which deplete dissolved oxygen due to high biochemical oxygen demand levels. Nutrient sources identified were urban storm runoff and municipal wastewater treatment plants.

Additionally, the Assessment identified that the Jordan River from Utah Lake to 6400 South is impacted by Total Dissolved Solids (TDS). Primary sources of TDS are water releases from Utah Lake and urban runoff. Utah Lake level fluctuations impact TDS levels on the Jordan River. When Utah Lake

levels are low, TDS levels are of greater concern.

Of the pollution parameters monitored during the 1996 study, dissolved solids were the largest contributor to water quality impairment, followed closely by metals. Running a distant third was nutrient loads, followed by sediment, habitat alteration and dissolved oxygen. It should be noted that the study did not include evaluation of coliform counts, a pollution parameter previous studies indicate as one of the Jordan River's biggest problems.

The State Division of Water Quality is conducting studies regarding waste loads from wastewater treatment plants on the Jordan River and studies regarding total dissolved solids.

Monitoring of water quality is ongoing. For example, the U.S. Geological Survey's National Water Quality Assessment (NAWQA) program in the Great Salt Lake Basin began sampling October 1998 and will continue monthly through the end of September 2000. In addition to nutrient and suspended-sediment samples, USGS is also collecting water for pesticide and VOC (Volatile Organic Compound) analyses. For the current NAWQA study there is a sampling site on the Jordan River at 1700 South, as well as two monitoring sites on Little Cottonwood Creek. USGS is publishing a 1980-95 nutrient and suspended-sediment retrospective on water quality that will be available in the latter part of 2000. Several reports and fact sheets that will include data and interpretation of recent water sampling will be available in 2002-2005.

Influencing urban stormwater runoff is the Environmental Protection Agency's new rule to control storm water runoff from cities under 100,000 people. In the past, storm water runoff only from cities over 100,000 people in population was required. This new rule will necessitate that all cities along the Jordan River obtain storm water permits by the year 2003.

Trends and Risks to Natural Values, if Current Conditions Continue

Trends Today most known point sources of pollution (such as "end-of-pipe" industrial discharges), are regulated by the Environmental Protection Agency and the State of Utah. Wastewater is treated at water treatment facilities. Currently the greatest threat to water quality on the Jordan River is nonpoint sources.

With increased urban development in the watershed, more impervious surface area is created due to paving, house tops, etc. Any chemicals, oils, etc. on these surfaces end up being channeled into storm drains or stream channels that eventually find their way to the river. The storm water challenge will increase along with development.

Another source of nonpoint pollution, sediment in the river, was traditionally controlled mechanically by removing it from the streambed (dredging) and by straightening and channeling the river through diking (ostensibly to stop eroding river banks). This method of removing sediment received extensive funding from

1980 to 1988.⁷ The current trend is to restore the river profile that reduces erosion during high flows and increases flood storage (see the Stream Channel and Floodplain Structure section in this chapter).

Risks Greater urbanization along the Jordan River could result in additional hard structures such as bridges, houses and businesses being built close to the river. Besides storm water discharge concerns, additional structures close to the river would restrict the River's ability to meander, cause it to dig deeper channels, and increase sediment loads from river banks into the River.

Greater urbanization could also eventually result in less water flowing in the river due to increased water withdrawals for municipal and industrial uses. In the short term this would probably not occur due to less use of irrigation water by farmers, but over the longer term this is a strong possibility. Less water in the river would increase the comparative amount of dissolved solids and other water pollution sources as well.

Due to numerous efforts, water quality could improve on the Jordan River. But if the reverse happens, and water quality decreases, this could impair wetlands, fish and other wildlife. Furthermore, a decrease in water quality on the Jordan River could greatly reduce the desirability of the Jordan River as a recreational area.

⁷ During this time period, over \$9.8 million was spent on these activities on the 30 mile stretch of the River in Salt Lake County. This amounted to a cost of \$327,000 per stream mile for the eight year period. (Jensen, 1988.)

BIOLOGICAL DOMAIN

TERRESTRIAL WILDLIFE

Pre-European Settlement

Under pre-European settlement conditions, larger mammals would have been able to move freely from the valley floor to the mountains with the seasons. Native species that used lowland riparian habitats, either seasonally or year round, included bighorn sheep, limited numbers of mule deer, coyote, beaver, muskrat, various small mammals such as jack rabbit, rodents, waterfowl, wading birds, shorebirds, and various migratory birds.

One of the first semi-quantitative inventories of predatory animals that lived in the Salt Lake Valley has been recorded in the L.D.S. Journal History of March 5, 1849 (see *Utah Historical Quarterly* Volume 62, Winter 1994 for details). The circumstances were that of a competitive “varmint hunt” organized as a winter season activity only a year after the Mormon pioneers had arrived in the Salt Lake Valley. Feeling threatened by the native “wolves, foxes, ravens and other animals”, two teams under the direction of John D. Lee and John Pack were organized and points were assigned for evidence of various predators killed. The final count as published in the 1849 record included two bears, two wolverines, two wildcats, 783 wolves, 409 foxes, 31 minks, nine eagles, 530 magpies, hawks and owls, and 1,026 ravens. It is likely that coyotes were listed as wolves, although wolves were certainly present at that time.

Since the varmint hunt probably included only the environs of Salt Lake City accessible

by horseback, this list of mammal and bird predators and scavengers argues for an incredible food base for these animals. More recent studies on Utah coyotes and jackrabbits indicate that with a predator density of 28 coyotes per one hundred square miles there can be one hundred to one thousand times more jackrabbits than coyotes (biomass and numbers, respectively) (Clark 1972 and Wagner and Stoddart 1972).

Similar studies of predator to prey ratios around the world indicate that there are generally 100 prey individuals for any given predator (Ricklefs and Miller 1999). If the total number of predators recorded in approximately 100 square miles around Salt Lake City in the 1848 list totals 2794, this results in a predator/scavenger density of approximately 28 animals per square mile, with their prey numbers over one hundred times that. The conclusion must be drawn that pre-settlement wildlife numbers were incredibly high, comparable to current international wildlife parks.

One can easily see why the Salt Lake Valley was used by different, native American tribes for joint hunting purposes. In addition, the riparian corridors provided by the various canyon streams flowing across the Salt Lake Valley to the Jordan River and then northward to the fertile delta marsh and wetlands bordering Great Salt Lake must have provided important habitat to support the numbers of both predators and their prey that existed at the middle of the nineteenth century.

Changes from Pre-European Settlement Leading to Current Conditions

Once a rich area for terrestrial wildlife, current use is very restricted.⁸ The introduction of domestic livestock (and diseases) and unregulated shooting led to the demise of bighorn sheep. With the transition from agriculture to urban sprawl, the ability for large mammals to seasonally migrate from the valley floor to the mountains (across numerous highways and streets) has become increasingly difficult. Limited numbers of deer, as well as other animals, have become yearlong residents along the Jordan River.

Smaller mammals, such as beaver, occur in numbers frequently regarded as a nuisance. Beaver often cut down trees planted for landscaping or revegetation purposes. Both non-native raccoon and red fox have increased over the last 20-30 years. Raccoon are nuisances in residential and agricultural areas, and also prey upon nests of many bird species. Red fox prey upon birds and rodents, as well as domestic fowl. In general, diversity and numbers of small mammals has decreased because of loss of natural habitat to urbanization. Also domestic animals, particularly cats, are major predators of birds and other small wildlife.

Trends and Risks to Natural Values if Current Conditions Continue

Trend With increasing urbanization (see Social Domain) the ability for wildlife to move seasonally between the mountains and valley floor will become almost impossible. Movement along the Jordan River is also becoming increasingly restricted as urban uses nudge ever closer to the banks of the river and additional bridges across the river further fragment the corridor. With increasing urbanization comes more domestic pets and predators that are tolerant of humans (raccoon and red fox).

Risk In an increasingly urbanized area, predation by cats, raccoon and red fox can be viewed as a major problem for some wildlife. A recent report *Cats and Wildlife: A Conservation Dilemma*, estimates that cats kill about 1 billion small mammals and hundreds of millions of birds in the United States every year. (Pyne 1999).

While these mammals pose a significant risk to birds and small mammals, many people enjoy viewing raccoon and fox.

⁸ *The Jordan River Terrestrial Wildlife Inventory: Proposed Lampton Reservoir Area Bonneville Unit, Central Utah Project*, January 1984, provides the most complete list available of wildlife species on the Jordan River.

AVIAN WILDLIFE

Pre-European Settlement

The green haven of extensive floodplain, wetlands, meanders and native vegetation once found along the Jordan River made it one of the region's richest avian resources in pre-European settlement times. Lowland riparian and wetland habitats in general are noted for their disproportionate contribution to the arid West's avian diversity. The intrinsic value of these habitats, coupled with the Jordan River's landscape position (connecting the internationally important Great Salt Lake and Utah Lake, and avoiding high and dry habitats of the Wasatch Range and the West Desert), makes it clear the Jordan River was an outstanding spot for breeding, wintering, and migratory birds. See Map 1.1 for an illustration of the significance of the Jordan River's strategic location.

The Jordan River offered high quality breeding habitat for likely over 200 species along the River or in its associated habitats, and it certainly added to the quality habitat for species breeding in the surrounding uplands. For wintering birds, dropping down in either latitude or elevation to avoid what some researchers call the 'ecological crunch' period (Knopf 1990), the Jordan River's habitats provided both food and shelter from predators and the elements: aside from vegetation along the river, Lockerbie (1949) noted warm-spring fed wetland complexes on the Jordan River used year-round by a wide variety of birds. However the Jordan's greatest use by birds probably came then, as it does now, with the turning of the seasons and the funneling through of hundreds of thousands of migratory birds. As stopover

habitat, the Jordan is ideally placed in the migratory landscape to benefit those species just passing through - a passage shaped by the surrounding terrain. Avoiding high elevation turbulence and daylight hour thermals, most passerines move at night through the lower elevations in a broad wave, often accumulating in riparian habitats by day to rest and refuel for the next leg. While difficult to quantify even today, this was an important use of the area. The scale of this use is suggested by the many specimens in Museum collections.

Human use of avian resources along the river corridor apparently consisted largely of taking waterfowl and larger shorebirds for food, as suggested by archeological sites in the valley, though extensive egg collection was also practiced by several southwestern tribes (Parmalee 1980).

Changes from Pre-European Settlement Leading to Current Conditions

Avian Population Changes Over Time

Museum records, historical accounts, personal histories and, more recently, inventory and population monitoring studies give a fairly detailed view (compared to the rest of the West) of the decline and eventual extirpation of many species utilizing the Salt Lake Valley, in general, and the Jordan River, in particular.

While many species remain abundant breeders in the valley, it is safe to say the avian community has declined dramatically in size and scope. Many riparian dependent species identified as either "common" or "abundant" breeders in the valley in the earliest days of European settlement (R.E.

Norvell, personal communication, based on unpublished data from E. Rickart, 2000) illustrate the changes. Eight of these include: American redstart (*Setophaga ruticilla*), black tern (*Sterna nigra*), common yellowthroat (*Geothlypis trichas*), grey catbird *Dumetella carolinensis*), warbling vireo (*Vireo gilvus*), willow flycatcher (*Empidonax traillii adastus*), yellow billed cuckoo (*Coccyzus americanus occidentalis*), and yellow-breasted chat (*Icteria virens*). These eight species were all present, though nesting in vastly reduced numbers, in the 1940's and into the 1950's. By the 1970's, American redstarts, black terns, and yellow-billed cuckoos were no longer observed breeding, or even occurring in the valley.

Today, willow flycatchers, grey catbirds, and warbling vireo have joined the list of species no longer breeding (or even occurring regularly) along the Jordan; common yellowthroats and yellow-breasted chats still breed but in small isolated populations. The species that have persisted or replaced these birds in the community are common generalists. The top ten most abundant species observed along the Jordan in the 1990's are: black-billed magpie (*Pica pica*), Western meadowlark (*Sturnella neglecta*), red-winged blackbird (*Agelaius phoeniceus*), song sparrow (*Melospiza melodia*), killdeer (*Charadrius vociferus*), barn swallow (*Hirundo rustica*), ring-necked pheasant (*Phasianus colchicus*), mourning dove *Zenaidura macroura*), American robin (*Turdus migratorius*), Mallard (*Anas platyrhynchos*), and American goldfinch (*Carduelis tristis*).

These results suffer by comparison to statewide riparian bird surveys conducted during the same period. Statewide surveys recorded over 200 species of birds, of which

the top 10 most commonly detected species were: yellow warbler (*Dendroica petechia*), American robin, spotted towhee (*Pipilo erythrophthalmus*), warbling vireo, song sparrow, mourning dove, lazuli bunting (*Passerina amoena*), broad-tailed hummingbird (*Selasphorus platycercus*), American goldfinch, and brown-headed cowbird (*Molothrus ater*). Other common species such as Plumbeous vireo (*Vireo solitarius plumbeus*), western wood-pewee (*Contopus sordidulus*), and house wren (*Troglodytes aedon*) are also absent breeders in the valley (Norvell 1997, Howe et al. 2000).

Concomitant changes to the bird community during this period include invasion and establishment of non-native birds, such as the house sparrow (*Passer domesticus*, first documented in 1869, first noted breeding along the Jordan in 1885, and described as a "common" breeding bird in the valley by 1930) and the European starling (*Sturnus vulgaris*, first noted breeding in 1939, already described as "relatively abundant breeder"). Brown-headed cowbirds were noted as early as 1869. Rock doves (*Columba livia*) likely came as domestic birds with the earliest settlers, however there is little information available to track their relative gains in abundance and distribution.

Causes of Change Absence of the riparian dependent birds noted above is largely due to the replacement of extensive willow bottoms and wet meadows with Russian olive and more xeric grass/forb meadows in the Jordan River. Additionally, tamarisk, which is increasing in the Jordan River corridor, supports lower bird densities and species diversity than native riparian habitats. The urban forest that replaced

native vegetation in many areas provides some limited alternative habitat for some bird species found in riparian habitats, such as yellow warblers, though at much lower densities. Remaining native vegetation along the river is in many places degraded by grazing and other land uses, further eroding habitat quality.

In addition to affecting type and pattern of vegetation, urbanization significantly affected avian wildlife due to disturbance by recreationists, invasions of exotic plants and animals from the urban area into the riparian corridor and favorable food and cover conditions to support elevated predator populations. Urbanization also caused habitat fragmentation and a decrease in riparian corridor width along the Jordan River.

Trends and Risks to Natural Values, if Current Conditions Continue

Trend The trend is to see more acres developed with homes or golf courses, resulting in the elimination of more native habitat, narrowing of the riparian corridor, and the continued degradation of persisting habitat.

Risk The Jordan River is considered lowland riparian habitat (lying below 5500 feet in elevation). This habitat type is considered the single most important habitat type in the state for avian species (Parrish et al. 2000). At least 98 (42%) avian species use lowland riparian as either primary (n=57 species) or secondary (n=30 species) breeding habitat or use it in winter (n=11). In sharp contrast to its importance, is the shortage of lowland riparian habitat; it covers less than 0.2% of the total area of Utah (Parrish et al. 2000).

The significance and rarity of western riparian habitats to breeding birds suffice to make the Jordan River important bird habitat. Its location at the heart of the Great Salt Lake flyway magnifies this value to migrants. For migrant species, extensive degradation and loss of wetland habitats formerly seen in the Salt Lake Valley enhance the importance of remaining habitat along the Jordan River by limiting the suite of already limited options. The Jordan River's role as stopover habitat remains important, despite local habitat losses and erosions of habitat quality, since migrant populations have nowhere else to go.

At risk, then, is stopover habitat for migrant birds and the remaining sites for breeding birds. Judging by the pace of changes to the avian community, and the accelerated pace of development, it is likely that breeding yellow-breasted chats and common-yellowthroats will be locally extirpated by 2010. These ground-shrub level species (the most vulnerable to human-caused changes to habitat) will soon be followed by all remaining species not able to cope with our rush toward a fully suburbanized riparian zone.

FISHERIES

Pre-European Settlement

Jordan River fishery data before alteration activities does not exist (Wilson, 1987). However, based on available historical information it is assumed the river supported a cold-water self-sustaining cutthroat trout fishery (see water quality section, pre-European settlement).

Changes from Pre-European Settlement Leading to Current Conditions

The Jordan River supported a cold-water fishery at least as far downstream as 1700 South in Salt Lake City in the 1890s. Charlie Lockerbie, chronicled that time as follows:

“Four fish will ever remain in my memory. One day I saw Arline’s pole take off for the river but I caught it just in time; on it was an 18 inch trout which weighed nearly two pounds. Two weeks later a similar experience with my own pole found a three pounder on it, which I landed. The third was on sister’s line. Three times I threw that big fish to the bank but was unable to hold it (it is always the biggest fish that gets away) . . . Later on in the summer I heard a great splash in the water, made by a large trout which I seized with my hands. This one weighed four and one-fourth pounds. It had been injured by a 22 rifle bullet which had entered its head . . . This fish was commonly known as the salmon trout owing to the deep pink flesh and reddish brown skin. The first three mentioned were Utah Lake trout, being almost white with flesh only slightly tinted pink.

Regarding these two types of trout it may not be amiss to say that both probably now are extinct so far as Salt Lake and Utah Counties are concerned. I believe seining exterminated the white type⁹ which lived in Utah Lake and was in fact a bleached variety of the reddish brown of the Provo River. The last of the Native brown which I saw caught in the Provo was about in 1919” (Lockerbie 1949).

Both diversion of Wasatch mountain streams (for culinary and irrigation use resulting in less cold water influence) and irrigation demand for Utah Lake water in Salt Lake County, via the Jordan River, strongly influenced Jordan River water quality and the type of fish that could survive in the river. Jordan River fish sampling in the 1980s¹⁰ indicated exotic and native nongame species are common in fishery reaches and are the dominant group of species at all sample sites, except at the Narrows. This is probably because members of this species group (e.g., carp) tend to be opportunistic feeders and can utilize a wider range of water quality and habitat conditions (Edwards and Twomey 1982). Low numbers of introduced warmwater game fish species were found at almost all sampling sites, but in reduced numbers, except at the Narrows site, where white bass was the dominant species. This group contains more species than the nongame fish species group. This may be the result of local introductions

⁹ These were probably cutthroat trout, which were abundant and large sized in Utah Lake when the Pioneers arrived in Utah.

¹⁰ The sampling was documented in the *Jordan River Fisheries Evaluation*, Maureen Wilson, 1987. The observations in the remainder of this section are found in that report.

and movement from Utah Lake, which supports many warmwater game fish species, including walleye (*Stizostedion vitreum*) and white bass (*Morone chrysops*) (Radant and Sakaguchi 1981, cited in Wilson 1987). Coldwater game fish species, the group least tolerant of poor water quality and lack of habitat and cover, (Raleigh, et. al. 1984, 1986, cited in Wilson 1987) were found in very low numbers at some of the sampling sites.

Generally, adverse impacts of channelization, dredging, and poor water quality limit fish habitat of the Jordan River. Channelization and dredging removed riparian vegetation, which provides very effective cover and moderates water temperature. Channelization also cut off associated wetlands such as oxbows, which are important in improving water quality, serving as flood flow channels during high water, and offering nursery habitat for young fish.

Currently, the Jordan River is stocked with rainbow trout and channel catfish on a “put and take” basis in the Riverton and Bluffdale areas. “Put and take” fish are stocked one year with the intention that they will be taken during that same year. It is not meant to establish a sustaining population based on habitat limitations.

Trends and Risks to Natural Values, if Current Conditions Continue

Trends Increasing urbanization is likely to place additional pressures on the fisheries. However, increased environmental awareness and more stringent regulations regarding water quality, wetlands protection and stream bank restoration should help improve habitat

conditions along the River. Even so, improvement to water quality in the Jordan River would still be limited by the quality of water leaving Utah Lake.

More municipalities are participating in stream bank and wetlands restoration projects. As natural features are restored, overall habitat diversity for fish should improve.

Risks If continual attention is not given to improving water quality as well as the overall health of the river, the fisheries could decline further. On the other hand, if fish habitat improves there would be a demand for more angler access along the river corridor. This could conflict with some management desires or objectives.

VEGETATION¹¹

Pre-European Settlement

The Jordan River left Utah Lake through a small marsh and entered the Great Salt Lake through vast marshes of bulrushes and reeds. Extensive sandbar willow (*Salix exigua*) stands dominated riparian vegetation, while cottonwoods (*Populus* spp.) were rarely mentioned in early descriptions of the Jordan River valley.

Large, peachleaf willow trees (*Salix amygdaloides*) were probably found along the floodplain of the Jordan River, since they are currently commonly found on all the tributary creeks to the Jordan River and in a few relict populations on the Jordan floodplain itself in northern Utah County and southern Salt Lake County. Unfortunately these willow trees are very susceptible to beaver damage, water table alteration by channelization, as well as by confined domestic animals in pastures. These factors may explain the current paucity of large, riparian willow trees along the Jordan River. The lack of early pioneer mention of willow trees along the Jordan River is problematic and could possibly reflect the high activity of beavers and fire frequency, both of which could have decreased the numbers of large,

tree willows in the pre-settlement riparian corridor.

Old river oxbow wetlands contained bulrushes, cattails, and other marsh plants. The Jordan River riparian corridor was isolated from other tall shrub or tree habitats of the Wasatch and Oquirrh foothills by a broad, flat valley dominated by drought tolerant, native bunchgrasses and low desert shrubs such as rabbit brush and big sagebrush. Riparian stringers probably connected the Jordan River riparian corridor to adjacent riparian habitats in the Wasatch Range to the east, but no mention is made in historical accounts of riparian corridors leading west to the Oquirrh Mountains (DuBois 1994).

Changes from Pre-European Settlement Leading to Current Conditions

Charlie Lockerbie, who lived along the Jordan River in the late 1800's was a keen observer of the natural environment and provides insight into the affects of European settlement on native vegetation.

“On a visit to the river years later I was surprised to find the stream borders almost completely denuded of willows, but was informed they had been gathered for a firm of basket makers. Stands of from one to five acres which were common then, had in some cases given way to farming. Only one such stand remained, that extended one half mile on the west side of the Jordan and north of 33rd South Street. It is now rapidly disappearing. Today in many places one cannot tell from a short distance where the river channel is located and the former sand bars are now mud bars, which support a

¹¹ Studies through the years provide more specific details on vegetation along the Jordan River than will be covered in this section. These studies include: Halpin, M. 1987, *Jordan River Wetland Vegetation Evaluation, Jordan River Wetland Advanced Identification Study*, prepared for the Utah Division of Wildlife Resources, and Johnson, C.S. 1993. *Jordan River Corridor Conceptual Master Plan - The Narrows to 11800 South*. Utah State University.

thick growth of cattails, a plant I never saw on the Jordan in the 90's" (Lockerbie 1949).

The disappearance of the braided stream, willow bottom wetland complex along the whole Jordan River corridor floodplain could be due to irrigation diversions and flood attenuation over the past 150 years. Regular flooding with attendant scouring and mud deposition on the floodplain is critical for the recruitment of woody willow and cottonwood species (see Appendix C for additional details). Various road and bridge crossing structures and attendant, repeated, channelization projects along the Jordan River has interfered with channel migration and movement that further changes the dynamic nature of floodplain inundation and woody riparian plant species recruitment.

Additional agents of change include grazing, filling and draining wetlands, and introducing exotic plants. Extensive grazing along remaining agricultural portions of the river continue to profoundly impact vegetation, including removal of grass cover, a decrease in structural diversity of shrub layer, and prevention of reestablishment of riparian species such as willows and cottonwoods (Dubois 1994).

Across the valley, entire complexes of fresh or saltwater wetlands have been drained and filled. Dahl (1990) estimated a 30% loss of wetlands in Utah since the mid 1800's, while local estimates indicate a 30% loss in the Jordan River floodplain from 1974 to 1986. These include unique warm marshes, fed by hydrothermally active springs. Historically the Jordan River entwined with many of these marsh complexes on the way to the Great Salt Lake (Norvell 1997).

As discussed earlier under the Stream Channel and Floodplain Structure sections of this Plan, the Jordan River has been dredged and the historic floodplain is no longer active. This has decreased the water table in the historic floodplain and thereby decreased water availability for wetland areas. Wetland desiccation resulted in a dramatic decrease in wetland vegetation and extensive invasion of the river bottom by upland vegetation. Furthermore, with increasing urbanization there is extensive pressure to build on upland areas immediately adjacent to wetland areas, as well as to dredge and fill wetland areas. While the U.S. Army Corps of Engineers regulates the dredge and fill of wetland areas under Section 404 of the Clean Water Act, it does not have direct authority for the upland areas. Other hydrologic modifications have effectively disconnected the riparian corridor of the Jordan River from the riparian corridors of the Wasatch Range. Many of the tributaries to the Jordan River were placed in underground conduits in the early part of the century, for flood control purposes, and other tributaries have been routed into concrete-lined ditches.

Numerous plants were brought to the valley by the settlers in 1847. It is thought that the native cottonwood (*Populus Fremontii*) was introduced as an important shade tree to northern Utah valleys from central and eastern Utah with rooted stem cuttings made by early pioneers. Later on with more settlement, the Lombardy poplars (*Populus nigra*) from Europe and the hybrid, eastern Carolina poplars (*Populus nigra X P. occidentalis*) were used for shade and windbreaks around orchards, fields and homes. Currently various hybrid, back-

crossed swarms of cottonwoods, created by wind pollinated crosses of the native Fremont cottonwood and the introduced black poplar and Carolina poplars, occupy areas along the Jordan River corridor where flooding recruitment of cottonwoods and willows happened all along the Jordan River after the 1983-84 "hundred-year" flood disturbance. Unfortunately, many of these hybrid cottonwoods have been killed by heavy beaver predation over the last fifteen years.

Exotic pasture grasses such as orchard grass (*Dactylis glomerata*), Kentucky bluegrass (*Poa pratensis*), reedtop bentgrass (*Agrostis stolonifera*), quackgrass (*Elymus repens*), and introduced pasture species of wheatgrass and fescue have become progressively more common on the Jordan River floodplain due to pasture overgrazing and re-seeding.

The native floodplain species such as reed canary grass (*Phalaris arundinacea*), western wheatgrass (*Elymus smithii*), saltgrass (*Distichlis spicata*), Muhly scratchgrass (*Muhlenbergia asperifolia*), alkali dropseed (*Sporobolus airoides*), American alkali grass (*Puccinellia nuttalliana*) and the native rushes (*Juncus* spp. and *Scirpus* spp.) and sedges (*Carex* spp.) have all become progressively less common due to both intense overgrazing by confined domestic animals, cultivation agriculture on the floodplain, water table lowering by channelization and mosquito abatement, and by competition with non-native pasture grasses and weeds (see Appendix C for additional information concerning original native vegetation of certain areas of the Jordan River corridor).

Ornamental planting of Russian olive (*Elaeagnus angustifolia*) probably started

shortly after 1900 in the Salt Lake valley, but this tree remained uncommon outside cultivation until the 1940's when it started to spread rapidly along fences, ditch banks and streams. Christensen noted that it was abundant by the 1960's (cited in DuBois 1994, p.8).

It is noteworthy that the increase in Russian olive was concomitant with the notable increase in local populations of European starlings which reached staggering numbers during the 1970's and 1980's, with large flocks feeding on Russian olive seeds in the fall and winter and spreading the excreted seeds over the whole Salt Lake Valley (Dr. A. T. Harrison, personal communication, 2000).

Russian olive is now the dominant tree species of the Jordan River corridor. Other exotic tree and tall shrub species present in the Jordan River corridor include Siberian elm (*Ulmus pumila*) and various fruit trees.

Tamarisk or salt cedar (*Tamarix ramosissima*) was widely planted in Utah during the early part of the century, and was found escaping to the wild along Utah Lake by 1926 (Cottam, cited in DuBois 1994, p.8). By 1961, tamarisk occurred as a major plant species along rivers and lakes in the Salt Lake and Utah Lake valleys (Christensen, cited in DuBois 1994, p.8). It is now common along the Jordan River, especially in the Bluffdale and Riverton areas where it is co-dominant with Russian olive. Native stands of sandbar willow (*Salix exigua*) and peachleaf willow (*Salix amygdaloides*) persist along some portions of the Jordan River (DuBois 1994).

The Jordan River Wetlands Advance Identification Study (WAIDS), completed in 1987, identified 2000 wetland acres in 22 Wetland Basins on the Jordan River from the

Jordan Narrows to 2100 South. Using this information, Table 2.1 was developed to identify wetland and upland acres lost since pre-settlement times.

Table 2.1 Pre-Settlement and Current Wetlands and Uplands Acres¹²

Land Type	Pre-Settlement Condition	Current	Percent Remaining
Wetlands			
Approximate Acres	6,240 ¹³	2690 ¹⁴	43%
Composition	Complete, integrated mosaic of native vegetation and uplands	Fragments of native vegetation and wetlands	

¹² This estimate includes wetlands and uplands along the Jordan River from Utah Lake to I-215 and Redwood Road in North Salt Lake.

¹³ To derive the acreage, the assumption was made that for approximately 39 miles from Utah Lake to I-215 along the Jordan River, wetlands comprised ¼ mile. Given the broad flood plain under pre-settlement conditions this may be a conservative estimate. One-quarter mile of wetlands for 39 miles equates to 6,240 acres. (One-quarter mile = 1320 feet x 205,920 feet [which is 39 miles x 5280 feet/mile] = 271,810,000 square feet. There are 43,560 square feet in an acre. Therefore, 271,810,000 square feet divided by 43,560 square feet = 6,240 acres.)

¹⁴ Exact acreages are not available, although a better estimate is obtainable than for pre-settlement conditions. The WAIDS study completed in 1987 identified 2000 wetland acres. As shown on Maps A3-6, some areas identified by WAIDS have been developed. A rough estimate of 200 acres being developed would leave 1800 acres of wetlands in the WAIDS study area from the Jordan Narrows to 2100 South. From 2100 South to I-215 and Redwood Road another 250 acres of wetlands was estimated. And in Utah County a rough estimate of 640 acres. This totals 2690 acres (1800+250+640).

Land Type	Pre-Settlement Condition	Current	Percent Remaining
Uplands			
Approximate Acres	6,240 ¹⁵	4,000 ¹⁶	64%
Composition	Integrated floodplain to upland terrace with native vegetation	Highly altered vegetation with numerous developments	
Total Wetlands and Uplands			
Approximate Acres	12,480	6,690	54%
Composition	Highly integrated mosaic	Highly altered and fragmented	

Trends and Risks to Natural Values if Current Conditions Continue

Trend Historic urban development on the floodplain, dating from the early 1900's in Salt Lake City, and continuing to the 1970's and 1980's in the Murray area at approximately 4500 South, essentially destroyed the hydrological and ecological integrity of the Jordan River riparian system in the northern half of Salt Lake County. Intensive urban and commercial development is currently taking place on the floodplain in the South Jordan area of Salt Lake County and will probably progress to the south to the

Riverton/Bluffdale areas. Inevitable conflicts will arise between urban uses (housing and business construction, active recreation, mosquito abatement, feral dogs and cats) and natural area preservation and restoration.

In the small, remaining areas of potentially restorable habitat along the Jordan River corridor, the riparian cottonwood and willow trees as well as sandbar willow shrubs will not become established in sufficient number and density to compensate for beaver predation. This is due to the lack of significant, periodic, flood events. The proximity of urban developments adjacent to

¹⁵ The 6,240 acres was derived by assuming that the upland area would have comprised another ¼ mile within the broad floodplain area and from bluff to bluff within the Jordan River. In other words, the assumption was made that from bluff to bluff would have averaged ½ mile from Utah Lake to I-215 and Redwood Road. This is a little misleading. Areas from bluff to bluff are fairly easily definable at 12300 South and 10600 South, but are not even apparent by Utah Lake or around I-215 and Redwood Road. Another way of looking at it is that the River, and the wetland and upland mosaic that would have been directly associated with the River, would have comprised roughly ½ mile in breadth on average in the Jordan River Corridor.

¹⁶ The 4,000 acres was roughly estimated on the basis that much of the land between 8800 South in Salt Lake County and Utah Lake on the Jordan River is still largely undeveloped, except for open land components such as golf courses and farms. Land north of 8800 South becomes increasingly more developed until reaching Rose Park Golf Course in Salt Lake City.

the Jordan River will prohibit normal flooding dynamics of the river and natural recruitment of native trees and shrubs. Restoration riverbank plantings will be required.

Similarly, so few natural seed sources of native riparian understory shrubs (chokecherry, fragrant sumac, Wood's rose, golden currant, black hawthorn) occur on the floodplain corridor (for birds to spread seeds to new, protected restoration areas) that human intervention by nursery propagation and planting will be required in the future.

Risk Due to permanent hydrological alterations, one hundred and fifty years of intensive, wetland pasture overgrazing pressure, the introduction of highly competitive, non-native plant species, and now finally the conversion of floodplain wetlands to urban uses, the Jordan River riparian system is in an inevitable downward ecological spiral, unable to recover on its own.

SOCIAL DOMAIN

HUMAN USE AND MANAGEMENT OF THE RIVER CORRIDOR

Pre-European Settlement

The first human inhabitants of what we now call Utah arrived at least 10,000 years ago. The earliest well-established archaeological site in the state is Danger Cave, near Wendover, which contained a hearth dated at approximately 10,000 years before present. Many other sites in the area contain evidence of this time period, when Paleo-Indians lived among and even hunted the now extinct Pleistocene megafauna such as the Colombian Mammoth, giant ground sloths, musk oxen, and camels. People surely visited and occupied the Salt Lake Valley during these times, although to date, no sites of such antiquity have been discovered here, in large part because extensive development of the area has destroyed or covered over evidence of prehistoric human presence.

Following the end of the Pleistocene, Archaic hunter-gatherers foraged over the entire state, including along the Wasatch Front. A recent discovery of an Archaic camp site along the Jordan River near Bangerter Highway promises to add much to our understanding of broad-based foraging cultures that inhabited the area for over 8,000 years.

Beginning approximately 2,000 years ago agriculture was practiced in the area by people now known as the Fremont Culture. This period is characterized by semi-permanent pithouse villages, above-ground adobe storage structures, decorated and plainware pottery, and a mix of corn, bean, and squash agriculture and

hunting and gathering. Fremont sites in the Great Salt Lake area were once numerous, but have been nearly eliminated by development. A Great Salt Lake Fremont site was recently discovered under South Temple Street across from the Delta Center during construction of the light rail. The site was occupied approximately 900 years ago, and contained evidence of agriculture, hunting, and fishing in nearby City Creek and Jordan River.

Approximately 700 years ago evidence of the Fremont Culture disappears from the archaeological record and is replaced by a hunting and gathering lifeway characteristic of tribes present when Europeans first arrived in the area. The area around Utah Lake and along the Jordan River to the Great Salt Lake was primarily the home to various Ute bands who hunted, gathered, and fished for subsistence. The area was also visited and used by the Utes' neighbors, the Goshute to the west and the Shoshone to the north.

Changes from Pre-Settlement Leading to Current Conditions

Human Use Not unlike early Indian occupants of the Great Salt Lake Valley, European settlers were drawn to the Jordan River for its natural resources. After 1847, the land became more and more divided into parcels for use by cities, irrigation companies, individual owners and LDS church operations. At one time the Jordan River's primary use was agricultural and grazing purposes. In the last 150 years, the river has been greatly altered to accommodate human use for flood control, water delivery, agriculture, mining, and increasingly urban development, such as housing and recreation.

The Jordan River is centrally located within the Greater Wasatch Area (GWA), which includes a 10 county area stretching from Nephi to Brigham City, and from Kamas to Grantsville. The GWA is currently home to 1.7 million residents, who constitute 80% of the state's population, making Utah the sixth most urban state in the nation. The area's developable private land, which may total as little as 1000 square miles, is surrounded by mountains, lakes, deserts, and public lands that form a natural growth boundary, within which nearly 370 square miles of land is currently developed. By 2020, the area is projected to grow to 2.7 million residents, and is forecasted to reach 5 million by 2050, placing additional demands on the limited supply of undeveloped private land (Envision Utah, 2000).

These undeveloped private lands include those along the Jordan River and are under the management of a number of different jurisdictions.

Management The river runs through three different counties: Utah, Salt Lake and Davis. Counties have responsibility for the building and maintenance of flood control projects, and the protection of flood channels and flood plains along the Jordan River as detailed in Utah Code Annotated Title 17, Chapter 08.

Utah County Approximately 9 miles of the approximately 44-mile-long Jordan River are in Utah County. Political boundaries of Saratoga Springs, Lehi and Utah County border the Jordan River.

Salt Lake County contains an estimated 35 mile reach of the Jordan River from the Utah County line to approximately 2300 North on the east side of the Jordan River. Salt Lake

County extends northward to the Great Salt Lake on the west side of the River. Twelve municipalities border the river. Table 2.2 lists each community and the extent of the river within their jurisdiction in Salt Lake County.

Table 2.2 Salt Lake County Communities and Approximate Mileage Along the River

Bluffdale	5 miles
Draper	1 mile
Riverton	1 mile
South Jordan	3.5 miles
Sandy City	.5 miles
West Jordan	2.5 miles
Midvale	1.5 miles
Taylorsville	2.25 miles
Murray City	2.25 miles
West Valley City	1.5 miles
South Salt Lake City	1.5 miles
Salt Lake City (to 2300 North)	8.0 miles

Davis County borders the east side of the Jordan River for roughly six miles from just north of 2300 North in Salt Lake City to the Great Salt Lake. North Salt Lake borders the Jordan River. Other cities, such as Woods Cross, Bountiful and West Bountiful are also in close proximity.

Utah State Division of Forestry, Fire and State Lands The bed of the Jordan River is considered sovereign land and managed by

the State Division of Forestry, Fire and State Lands as a navigable water for Utah citizens. However, through time, various dams and structures, such as Turner Dam at the Narrows, have been put in place, primarily for irrigation and water distribution purposes.

The Division is currently working on defining the State ownership of the bed of the Jordan River, including abandoned oxbows.

The Division has responsibility to ensure preservation and protection of the Jordan River for navigation, commerce and fishing as well as recreation, preservation and public access. The Division is beginning to consider impacts to navigation. Fewer impediments could have a positive impact on wildlife, particularly fisheries.

Utah State Division of Parks and Recreation has been instrumental in developing the Jordan River State Park, which currently goes from North Temple to I-215 and Redwood Road (see Maps A6 and A7).

Provo-Jordan River Parkway Authority has been working to develop a trail system along the Jordan River from Great Salt Lake to Utah Lake and then to Jordanelle Dam. The Jordan River Parkway concept was included in official Salt Lake City master plans since 1927. A parkway plan was developed in 1971 (*Jordan River Parkway: An Alternative* by Urban Technology Associates, August 1971). Active trail and parkway development began under Governor Scott Matheson's leadership with the formation of the Jordan River Parkway Foundation in 1980.

The River Enhancement program has jurisdiction over 150 feet from both banks of the Jordan River that has enabled

development of a trail. The trail is already complete along the Jordan River in Utah County and is largely in place in Salt Lake County, except for areas south of Bangerter Highway. Maps 1-7, in Appendix A, identify the trail's location. At this point there is not a Jordan River trail system in Davis County, but there is interest.

The trail system provides valuable open space and recreational opportunities in the middle of a major metropolitan area. However, from the viewpoint of wildlife, the concern is how to design and manage the trail to minimize any negative wildlife impacts, while providing education and other leisure opportunities for parkway users.

Federal Agencies There are also a number of Federal agencies that are implementing programs on the Jordan River. Table 2.3 lists the agencies, their programs and authorities.

Table 2.3 Federal Agencies Actively Working to Acquire and/or Restore Habitat within the Jordan River Meander Corridor

Federal Agency	Authority / Program
U.S. Fish and Wildlife Service	<ul style="list-style-type: none"> ■ Comprehensive Environmental Response Compensation and Liability Act - Natural Resource Damage Assessment and Restoration Program
Utah Reclamation Mitigation and Conservation Commission	<ul style="list-style-type: none"> ■ Central Utah Project Completion Act - Title III
Environmental Protection Agency	<ul style="list-style-type: none"> ■ Clean Water Act - Section 319
U.S. Army Corp of Engineers	<ul style="list-style-type: none"> ■ Water Resources Development Act of 1996 - Section 206 ■ Clean Water Act - Section 404 (regulatory)

Jordan River Sub-Basin Watershed Council Managing the Jordan River with all of these political considerations is no easy task. One mechanism that has been useful to increase coordination is the creation of the Jordan River Sub-Basin Watershed Management Council by the Salt Lake County Board of Commissioners in 1993. This advisory Council consists of the 12 cities mentioned in Table 2.2, as well as Alta Town, and representatives from Federal, State and County Agencies. Participation in meetings from interested non-governmental organizations and citizens was encouraged. The Management Council did not include representation from Utah or Davis Counties. The Council is currently being restructured.

Land Use Map 2.1 shows the future land use in Salt Lake County. As the map indicates, in Salt Lake County the Jordan River is a narrow strip of green or open space through the middle of a major metropolitan area. Land uses in Utah and Davis Counties are also becoming increasingly urbanized. A more complete description of categories used in the map can be found in Appendix B.

Reserved, Nature Parks, Undecided and Open Areas Along the Jordan River Despite increasing urbanization, there are undeveloped areas along the Jordan River. Many of these areas are displayed on Maps A1-8 (Appendix A). Accompanying each map is a more detailed description of specific parcels on the map as well as additional information about that section of river.

Categories of land use displayed on the maps and their definitions are the following:

Reserved Areas managed by deed restriction or ownership primarily for native vegetation, wildlife and/or wetland purposes. Human uses may occur on the land, such as a trail, but these uses are secondary, limited and generally discouraged. These lands include parcels owned by the Utah Reclamation Mitigation and Conservation Commission, wetland mitigation sites permitted by the U.S. Army Corps of Engineers or lands that have a conservation easement placed on them.

Nature Parks Areas managed for vegetation, wildlife and/or wetland values in combination with designated trails and/or visitation of the area for wildlife viewing, nature appreciation, hunting (for areas by the Great Salt Lake), etc.

Undecided Areas included in project proposals to become part of a reserved area, nature park or open area. Final determination depends on the willingness of the landowner to sell the land at a negotiated price for this purpose, or to provide for the use as a reserved, nature park or open area by some other type of formal agreement, such as a conservation easement.

Open Areas primarily for human use, that have limited infrastructure or buildings such as golf courses and parks. These lands may and often do provide some natural values and could be modified to provide more, but that is not their primary use.

Map 2.1 Future Land Uses in Salt Lake County

Note: The Map is not available in this format.

Table 2.4 displays the approximate number and acreage of each category from Utah Lake to I-215 and Redwood Road (Maps A1-7).

Table 2.4 Land Ownership and Management from Utah Lake to I-215 and Redwood Road by the Salt Lake/ Davis County Border

Type of Area	Approximate Number	Approximate Acres
Reserved Areas ¹⁷	15+	341+
Undecided Areas ¹⁸	6	447
Nature Parks	17	311
Open Areas		
Parks	31	1014+
Golf Courses	9	996

Map A8 is quite different from Maps A1-7. It is associated with the broad flood plain of the Great Salt Lake and a large delta system, while Maps 1-7 depict a much narrower corridor. Map A8 displays information

¹⁷ Of these reserved areas, there are 13 U.S. Army Corps of Engineers permitted sites containing 221 acres. There are also 3 sites that are Sharon Steel Superfund Restoration sites containing 103 acres that include many partners such as U.S. Fish and Wildlife Service, Utah Reclamation Mitigation and Conservation Commission, South Jordan City, West Jordan City, Great Salt Lake Audubon, and Tree Utah. Note that the Army Corps of Engineer sites included in the table and this note exclude smaller projects that are listed beginning on page A2.

¹⁸The undecided areas include the entire project that was proposed for the three Sharon Steel Superfund Restoration projects of an additional 165 acres not already reserved and the property known as the Prison property owned by the State of Utah, which is being proposed as a mitigation bank for the Utah Department of Transportation. This is a 252 acre project.

regarding the larger sites on the Jordan River in Davis and Salt Lake Counties, as well as areas west and northwest of the Salt Lake City International Airport.

The Jordan River proceeds in a northerly route before it enters Farmington Bay. Roughly 10,000 years ago the Jordan River would have entered the Great Salt Lake in a westerly direction from the Salt Lake Airport. Over time the Jordan River has shifted towards its current northerly direction. However, physical features of the old Jordan River delta are still in place in many areas to the west and northwest of the Salt Lake Airport. Furthermore, due to the Surplus Canal, water is delivered to this old Jordan River delta. Information contained on Map 8 and the accompanying narrative provides a greater understanding of the Jordan River delta in its old and new locations.

There are many efforts to preserve wetlands in these delta systems that are associated both with the Jordan River and the Great Salt Lake. Because of this and the fact that it is a much broader system, information from Map A8 is reported separately in Table 2.5 as it would be misleading to combine this information with the rest of the corridor.

Table 2.5 Land Ownership and Management in Davis and Salt Lake Counties including West and Northwest of the Salt Lake Airport

Type of Area	Approximate Number	Approximate Acres
Reserved Areas ¹⁹	3	4,700
Undecided Areas ²⁰	2	3,700
Nature Parks and/or Reserved Areas ²¹	19	34,560

Tables 2.4 and 2.5 provide a contrast between the large numbers of acres reserved or considered as nature parks on the Jordan River delta (Table 2.5) in comparison to the relatively small numbers of acres reserved on the Jordan River (Table 2.4). Nevertheless, approximately 341 acres designated as reserved for wildlife on the Jordan River, south of I-215 and Redwood Road, does show a significant amount of acreage set aside for wildlife/ wetlands/ native vegetation in the Jordan River corridor. The other undecided areas and

¹⁹ Includes the Salt Lake Airport mitigation site, Inland Sea Shorebird Reserve and Gillmor Sanctuary.

²⁰ Represents the 1,500+ acre mitigation site for the proposed Legacy Parkway and the 1,200 acres adjacent to the Salt Lake Airport mitigation.

²¹ Includes Farmington Bay Waterfowl Management Area (17,000+ acres), the South Shore Duck Clubs (16,700+ acres) and mitigation properties (860+ acres).

nature parks also add opportunity to provide habitat for wildlife.

Trends and Risks to Natural Values, if Current Conditions Continue

Trend As graphically illustrated by Map 2, areas along the Jordan River are becoming highly urbanized, and with projected increases in population, are likely to become even more so. This will put increasing pressure on the River and lands close to the River.

Recreational use of the Jordan River is also increasing. Golf courses such as River Bend and River Oaks have recently been developed and others are being considered. Furthermore, there is a major impetus to finish the Jordan River Trail in Salt Lake County.

The potential for increased recreation was recognized in the the *Jordan River Nonpoint Source Management Plan* (Jensen 1988), which estimated in 1988 that “If the Jordan River were managed to optimize river recreation and urban fishing, 482,000 recreational visitor-trips and 25,000 fishing trips could occur every year, with an annual economic value to the community of \$1.2 million.” The use and dollar value would be higher now. For example, if a 2% annual growth rate were assumed there would be over 600,000 recreational visitor trips, and 31,000 fishing trips as well as an economic value to the community well over \$1.5 million. In regards to recreation, the report concluded that, “The Jordan River has tremendous potential for management of multiple resources with higher benefit returns to the taxpayer.”

Risk Remaining natural areas along the River are at risk for development. As discussed in this section, the approximate 341 reserved acres on the Jordan River from Utah County to I-215 and Redwood Road in North Salt Lake provides wildlife habitat. However, this is a small amount compared to the 12,480 acres of upland and wetland habitat estimated for pre-settlement condition for this same area (see Vegetation Section). Furthermore, much of the 6,690 acres roughly estimated as remaining in wetland and upland habitat is privately owned and susceptible to development that would not benefit wildlife. If only 341 of the 12,480 acres estimated along the Jordan River is specifically managed for wildlife in the future, this would be less than 3% of the pre-settlement corridor for wildlife. Any new development will put more pressure on an already stressed system. Additionally, if not designed with wildlife in mind, increasing recreation use could negatively impact wildlife.

Note: Also see Trend and Risk under previous sections, particularly Vegetation.

CHAPTER 3

ISSUES AND RECOMMENDATIONS

This chapter identifies nine issues of concern, based on information provided in Chapter 2. This chapter also contains recommendations to address the issues.

Issue A : Alteration of the Jordan River from its Pre-Settlement Condition and Consequences of Alteration

Due to flood control projects and channel stabilization work the once meandering Jordan River was, in many places, straightened, and the river disconnected from its floodplain. Without the inundation of the floodplain, wetlands lost their source of moisture. In addition to being disconnected from the river and dried because of channelization, wetlands and oxbows were also drained and filled as a result of agriculture and urbanization. The natural cycle of water flow through the river that supported maintenance of native vegetation was also altered to comply with the dictates of water rights for irrigation and culinary use. Native vegetation was further impacted by extensive grazing. With the loss of native species, exotics such as tamarisk and Russian olive became the dominant species along the corridor.

These changes significantly reduced wildlife habitat. Degraded water quality from overgrazing, agriculture, industry and urbanization further impacted wildlife habitat. Urbanization, in addition to narrowing the corridor and contributing to water quality degradation, introduced more

people and domestic animals to the system further stressing wildlife.

Recommendations

A1. Establish a Natural Conservation Corridor

Create a Natural Conservation Corridor on the Jordan River, from Utah Lake to I-215 and Redwood Road in North Salt Lake, that includes properties identified as reserved, nature parks, and open on Maps A1-7. Currently, there are approximately 300 acres of nature parks, 1,000 acres of golf courses and 1,000 acres of parks. As part of this recommendation, lands in the reserved category would be increased to approximately 1,500 acres. As discussed under Land Use in Chapter 2, approximately 341+ acres are already reserved and an additional 447 acres are undecided but it is possible that many of these acres could be placed into reserved status.

Maps A1-3 in Appendix A display remaining large blocks of land south of 12300 south that are not developed and could significantly contribute to the reserved areas for the Natural Conservation Corridor. Four areas in this region are recommended to be acquired as reserved properties in the Natural Conservation Corridor based on the following criteria:

Areas Have Substantial Size This would assist in maintaining native vegetation, and wildlife would have less disturbance. *The Sharon Steel Damage Settlement: A Conceptual Restoration Plan* (DuBois and Gutermuth 1995) placed high priority on large areas of at least 20+ acres.

Areas Have High Value Wetlands and Riparian Areas Sites recommended include large wetland areas. Recommended areas had the following WAIDS (a Salt Lake County wetlands study)¹ rankings: #1 for part of Recommended Area 1; #1 for part of Recommended Area 2; and, #4 for a portion of the area in Recommended Area 3. A ranking of #1 indicates that that wetland basin has higher wetlands values than 22 others evaluated. Utah County has not conducted an intensive study of their wetland areas along the Jordan River. Wetlands values for this area are identified to some extent in Appendix C.

Areas are Upstream from Sharon Steel The Sharon Steel Damage Settlement: Conceptual Restoration Plan (DuBois and Gutermuth 1995) stated in the preferred alternative that “Conducting restoration in areas upstream from Sharon Steel would be expected to reduce potential for additional injury to trust resources from residual contamination and would provide cost-effective restoration of previously injured bird communities.”

Reserving the Land is Feasible In the four sites identified, acreage beyond that recommended would be ideal from a natural systems perspective. However, even

obtaining the acreage listed is likely to be difficult due to the cost and the need to work with willing landowners. One advantage of all four sites is that they are still zoned agriculture.

Reserved Areas Make a Difference for Wildlife Quantifying this difference in detail is difficult. But the Jordan River is inescapably an important corridor for migratory birds. The four sites identified in Table 3.1 are large patches of relatively undisturbed lowland riparian habitat, and are fairly closely connected with one another. Reserving these sites for wildlife would be beneficial for wildlife, particularly migratory birds.

¹ Rankings for 22 wetland basins were based on values assigned to nine different wetland functions for each basin. The wetland functions were: groundwater discharge, flood storage, shoreline anchoring, sediment trapping, pollutant retention, food chain support, fishery habitat and wildlife habitat. The values were then summed in order to prioritize wetland basins. These rankings were based on a one year study completed in 1987 and should be viewed as general indicators of importance that could change with additional information.

Table 3.1 Recommended Additions to the Natural Conservation Corridor²

Recommended Area	Approximate Acreage	Rationale for Inclusion
1. West side of River between Riverbend Golf Course and Bangerter Highway	200 acres	This large area was identified as a high priority wetland area in the WAIDS study. The “Colby,” Riverbend Nature Area, and the “Prision Property”, which are east of this property, currently constitute the largest single block of reserved, nature park and undecided areas along the Jordan River. The addition of this area would provide continuous habitat along both sides of the River.
2. Bangerter Highway to 14600 South	150-200 acres	This large area is identified as a high priority wetland area in the WAIDS study. It would be south of Bangerter Highway and is next to the property proposed in Number 1 above. This is a large area that includes property on both sides of the River.

² These areas are listed going north to south. No attempt has been made to prioritize these areas since each of them is important. Furthermore, obtaining any one of these areas for habitat and wildlife values will depend on many factors including: willing landowners, the coordination of interested parties pursuing sites, and available funding.

While small reserved areas might still be accomplished from 2300 North in Salt Lake City to 12300 South, these areas have been or are rapidly being developed. There are exceptions to this: the Sharon Steel projects underway in West Jordan and South Jordan and with Audubon/TreeUtah. But generally, the best opportunities occur south of 12300 South to Utah Lake and north of 2300 North in Salt Lake County. Note that the *Jordan River Wetland Acquisition and Management Plan*, completed in 1995 by Steve Jensen, provides additional information about potential acquisition areas and management suggestions for Salt Lake County from the Utah County border to 2100 South.

Recommended Area	Approximate Acreage	Rationale for Inclusion
3. The Jordan Narrows area, which would include areas roughly up to 1.5 miles north of the Salt Lake County Utah County Border.	150-200 acres	The Jordan Narrows includes the best representation of native vegetation along the entire Jordan River. This is also where the river is braided and connected to its floodplain. Previous bird surveys indicate that this area already includes significant breeding habitat for migratory birds such as yellow-breasted chats and willow flycatchers. One of the reasons for the high diversity in vegetation and good avian breeding habitat is that the narrows is very difficult to access.
4. Utah County, south of Thanksgiving Point to Inlet Park	150-300 acres	Utah County has an extensive flood plain and wetland area by the Jordan River. A rough estimate indicates that over 1,360 acres of land is in the floodplain and over a mile or 640 acres could be considered wetland habitat. While there is one reserved area and some nature parks along the Jordan River in Utah County, a large piece of land could be acquired, or in some other manner reserved for wildlife.
Total Acreage		650 - 900 Acres

The total approximate acreage recommended for inclusion in the above is between 650 to 900 acres. If these lands were added to the lands already reserved and undecided, reserved areas would total between 1,438 to 1,688 acres. This acreage would be comprised of wetlands as well as associated uplands.

Under pre-settlement conditions, the Jordan River corridor (from Utah Lake to I-215 and Redwood Road in North Salt Lake) included approximately 12,480 acres of a highly integrated wetland and upland mosaic that

provided significant wildlife habitat. If roughly 1,500 acres could be managed for native vegetation and wildlife this would be roughly 12% of the land base that existed in pre-settlement conditions. Even at 12%, wildlife values will be diminished as the properties are not contiguous.

At this point, research is not sufficient to tell us whether 1,500 acres of reserved areas, along with the current 2,300 acres of nature parks and open areas, will provide habitat necessary for adequate stop-over and breeding habitat for avian species. What we

do know is that due to the Jordan River's location and habitat type (lowland riparian habitat) it is necessarily and inescapably prime habitat for migratory birds. Birds will come to the Jordan River. They may come to a "sink" (an area where wildlife is harmed, which is the trend if all remaining natural areas are developed). Or they could find habitat adequate for successful reproduction and rest. The difference between these two scenarios may depend largely on the implementation of this recommendation.

A2. Restore Reserved Lands in Natural Conservation Corridor

Reserved lands recommended for inclusion in the Natural Conservation Corridor are those that have good potential for restoration. Recommendations for areas 1, 3 and 4 (from Table 3.1) are provided in Appendix C. Sponsorship of restoration would likely vary with each project.

A3. Establish Perpetual Management of Reserved Lands in the Natural Conservation Corridor

The Jordan River is in a highly urbanized area. This is likely to mean that management will need to address invasion of noxious weeds, trespass, and trash accumulation, in addition to more traditional management concerns such as wildlife habitat. Without professional ongoing management in perpetuity of reserved lands in the Natural Conservation Corridor, area values are likely to severely degrade. This already has occurred at the Little Dell Mitigation site. Recently, there has not been an active management presence at the site and consequently significant human incursions have taken place.

Figure 3.1 illustrates one recent inappropriate use of the area.³

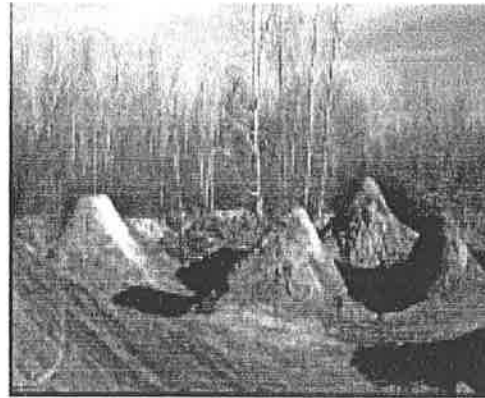


Figure 3.1 Inappropriate use of the Little Dell Mitigation Site as a BMX Track

Ideally an on-site manager would be able to identify such uses before they get established and direct them to more appropriate areas.

To ensure reserved sites within the Natural Conservation Corridor are managed for their natural values after restoration, the following recommendations are made:

One Management Entity is Responsible for Management of the Reserved Areas within the Natural Conservation Corridor

Managing wetlands, native vegetation and wildlife takes expertise acquired through professional training and experience. The management entity should have a natural resource management background, which would include the ability to work with many diverse constituents. While communities along the river have an important decision-making role, their expertise tends to be in developed parks rather than natural areas

³ As of September 2000, the BMX track no longer exists and active work to restore this mitigation area is occurring.

management. Additionally, reserved areas should be managed as a network not in isolation. This will result in more effective and efficient management.

Develop Management Plans Specific management goals and objectives should be developed for each reserved area that are consistent among areas. For example, the *Sharon Steel Natural Restoration Plan* (Peterson 1997) provides specific goals for wildlife habitat for the South Jordan, Audubon/TreeUtah and the West Jordan Projects. All three projects share the following goals:

- Manage lands in perpetuity for wildlife habitat
- Eliminate livestock grazing
- Replace undesirable and exotic species with desirable native species
- Significantly increase the density and areal coverage of native shrub and tree complexes supporting neotropical migratory bird habitat
- Stabilize the banks of the Jordan River; and,
- Modify site hydrology ⁴

⁴ Additionally, the Colby property (south of 12300 south on the Jordan River, a mitigation site for I-15 Reconstruction and a project of the Mitigation Commission), has a Wetland Mitigation, Monitoring and Maintenance Plan that states "The goal of the long-term maintenance program is to maintain the site as a functioning wetland system in perpetuity." The plan outlines maintenance tasks that the Mitigation Commission or its assigns will provide including ensuring water flow and availability as well as sustaining vegetation. Other miscellaneous tasks include trash removal, maintaining property boundary signs and fencing.

Ideally, plans would target specific conservation species of concern, e.g., yellow-breasted chat and willow flycatcher, identify their habitat needs, and then monitor the success of restoration by the degree to which these species return to the corridor. Management plans also need to consider predator control and pest management, among other items.

Limit Human Use to the Perimeter

Reserved properties in the Natural Conservation Corridor need protection from within-patch disturbance by humans or livestock. Smith and Schaefer (1992) (cited in Norvell 1997) looked at the effects on riparian birds of riparian vegetation, width of the corridor, and adjacent land use in an urban riparian corridor. They found that neotropical migrants were sensitive to habitat areas and widths in urban riparian corridors. Adjacent land use also affected riparian birds: forest riparian specialists were replaced by edge generalists in areas where the riparian corridor was surrounded by suburbs instead of farmland. Strong and Bock (1990) (cited in Norvell 1997) also found that bird species richness was greater in riparian areas next to grasslands. Nest parasitism and predation rates would likely increase with increasing disturbance, potentially creating sink habitat (Norvell, 1997). For that reason trails should be located outside of any reserved areas.

Develop an "Adoption" Program for Targeted Wetland Areas Programs such as "Adopt a Water Body" through the Utah Division of Water Quality, Utah Department of Environmental Quality, should be used by interested individuals, schools, or community organizations who wish to actively monitor, and perhaps even assist in

managing, a specific site set aside as part of the Conservation Corridor. This effort could be coordinated by the Great Salt Lake Audubon Jordan River Environmental Education Program or some other suitable program. This ongoing effort could be posted on a website.

A4. Fund Acquisition and Management of Reserved Properties in the Natural Conservation Corridor

Acquisition There are numerous funding opportunities for wildlife habitat and open space. An inclusive list will not be provided here. What often works best is the use of multiple sources being used in a well orchestrated fashion. The following are a few of the possibilities:

The U.S. Army Corps of Engineers could be encouraged to direct mitigation projects to the Natural Conservation Corridor.

The State Division of Forestry, Fire and State Lands may be able to assist with projects as they define ownership on the Jordan River.

The proposed federally funded Conservation and Reinvestment Act (CARA), state funding sources such as the LeRay McAllister Critical Land Conservation Fund and the Utah Division of Wildlife Resources Habitat Fund as well as local governments efforts similar to those recommended in Appendix D could all be vital sources for acquisition.

Private conservation initiatives.

Management Management of reserved properties should be funded by an endowment. This would ensure professional management of Natural Conservation Corridor reserved lands in perpetuity.

Amount Needed At a minimum, existing reserved areas management requires a part-time manager for properties that the Mitigation Commission, in cooperation with numerous other partners, has already obtained on the Jordan River.⁵ A yearly budget of approximately \$25,000/ year would be required to provide for a 1/3 time employee with limited additional funds for operating expenses. The person managing the current sites would still need cooperation from various partners for financial and volunteer assistance, law enforcement, etc.

Existing endowments would already provide approximately \$9,000 per year.⁶ An endowment of \$320,000 at 5% interest would provide the additional \$16,000/year.

If recommendation A1 is implemented, management for roughly 1,500 reserved acres would be necessary with a yearly budget of no less that \$60,000/year. This would provide a full-time professional with funds for operating expenses, but additional assistance to manage the properties would still be needed.

⁵ These properties are at 12300 South, 10600 South and between 8000 and 9000 South. Details on these properties are in Appendix A.

⁶ The existing endowments include a set-aside by the U.S. Fish and Wildlife Service for \$100,000 and \$72,000 set-aside for management of the Mitigation Commission's Colby property. At 5% these endowments collectively earn roughly \$9,000/year.

With \$9,000 from existing endowments, \$51,000 would need to come from other sources. If an endowment were created to fund the \$60,000/year, the total amount needed would be approximately \$1,200,000, assuming 5% interest.

Funding Sources Along with the current small endowment, budgeting dollars on a yearly basis to operate the reserved areas from various sources is a possibility that could be considered. However, seeking an endowment for as much of the operation of the reserved areas as possible would more likely ensure perpetual management of the reserved areas.

An endowment could be established by a non-profit, tax-deductible, organization so that individuals, businesses, and governmental entities could contribute to this endowment. Additionally, whenever a future Reserved lands project is proposed as part of the corridor, ongoing monitoring and management funds should be required as part of the proposal, e.g., mitigation projects under the U.S. Corps of Engineers 404 permitting process, or if the Prison Property becomes a mitigation bank, an endowment for this property for on-going management and monitoring should be required.

Since much more than \$6,000,000 would likely be spent to acquire or set-aside proposed properties, a \$1,200,000 endowment would be much less than the 20% of the purchase price generally desired for an endowment when The Nature Conservancy acquires properties.⁷

⁷ The Nature Conservancy and Utah Open Lands both require an endowment to fund future management costs associated with property interests

Another way to estimate the cost of management would be to provide a cost per acre or cost per project for long-term management. However, each project will vary to some degree. Costs will definitely include such items as personnel, support for personnel such as travel, phone, office and office supplies, as well as materials such as fencing, and seedlings. Overall, an endowment of 20% of the purchase price, to ensure perpetual management, is probably reasonable. With support from cities, volunteers and non-profit organizations, an endowment could probably be less, but the total annual cost including in-kind services would likely be at least equivalent to an additional 20%.

Issue B: Coordination of Jurisdictions

There needs to be a coordinating mechanism for areas that are part of the proposed Natural Conservation Corridor. The Jordan River Sub-Basin Watershed Management Council is an example of bringing together numerous entities to discuss the Jordan River within Salt Lake County. However, this Council is undergoing significant change in structure and purpose. Also, Utah County and Davis County were not part of this council.

that they acquire. Standard protocol for The Nature Conservancy is to provide for a long-term stewardship endowment. The amount needed for the endowment is generally based on 20% of the purchase price of the land. This 20% is beyond the initial start-up costs to get the property into properly functioning condition for long-term management. This 20% figure is not always achieved and will vary. One variable is the size of the property, if the property is large less than a 20% long-term endowment may be needed.

Recommendation

B1. Create a coordinating council for those entities with reserved, nature parks and open areas within their boundaries, as well as for other interested parties, to address issues that affect these areas. This council could be an entity such as the Jordan River Sub-Basin Watershed Management Council or the three county governments could convene a Jordan River Natural Conservation Corridor Advisory Council that combines major interests and jurisdictions from all three counties.

This group could also be responsible for implementing the recommendations in this Report.

Issue C: Awareness of Local Government and Civic Groups of the Natural Values of the Jordan River

City and County Governments and Civic Groups should be fully informed about the Natural Conservation Corridor and be encouraged to assist in maintaining and promoting the natural values of the Corridor.

Recommendations

C1: Make presentations to City and County Planning Commissions and City Councils, that have jurisdiction over lands in the Natural Conservation Corridor, as well as Civic Groups, regarding the value of the Corridor. Presentations could be conducted by the Great Salt Lake Audubon Jordan River Environmental Education Program, as well as other entities.

C2: City and County Planning Commissions and City Councils should develop and adopt

specific policies regarding the Natural Conservation Corridor. These policies should be based on a firm understanding of the value of the Jordan River for open space, flood control and wildlife habitat. For example, topics could include:

Application of the Meander Corridor Ordinance The Meander Ordinance was developed after completion of the *Jordan River Stability Study* (1992) that identified the meander pattern. The ordinance, adopted by Salt Lake County in 1994, identifies the boundaries of the Jordan River's natural meander pattern within the current floodplain and sets limits on the types of development and land uses that can occur within the designated corridor.

Non-Structural Methods to Stabilize Sources of Erosion Support projects that decrease erosion of river banks using non-structural means. For example, bank reshaping instead of dredging, diking and channelizing.

Preservation of Critical Lands Attempt to maintain existing natural areas by adopting Envision Utah's Quality Growth Strategy to preserve critical lands. Envision Utah's growth strategies are identified in Appendix D.

Landscape Management Encourage managers of various city properties, such as city parks along the River, as well as residents and businesses, to plant native vegetation that supports wildlife. Appendix E contains a list of native plants adapted for conditions along the Jordan River that help to support wildlife.

Management of Nature Parks Redwood Nature Area and Riverbend Nature Area in Salt Lake County and Inlet and Indian Ford Parks in Utah County are examples of areas that are managed entirely or in part as nature parks (places that are for people and wildlife). Management plans for these areas should be developed that balance access to the public for wildlife viewing and appreciation, while maximizing the habitat for and minimizing negative impacts on wildlife.

Recreational Use Compatible with Wildlife Needs When developing trails or other recreational opportunities along the Jordan River, experts in wildlife should be consulted so that recreational uses such as trails are as compatible with wildlife needs as possible. Also, *A Wildlife Conservation Manual for Urbanizing Area in Utah* (Johnson 1989) is a valuable document for officials and citizens to utilize.

Issue D: Coordination with Golf Courses

There are numerous golf courses by the Jordan River (see Maps A1-7, Appendix A) and others are being contemplated. While golf courses provide open space, as traditionally landscaped they do not maximize wildlife habitat potential.

Recommendation

D1. Encourage golf courses to incorporate wetlands and native vegetation, which support native wildlife, in their plans and management. Golf courses that are being planned should strongly consider the Audubon International Signature Program. Currently operating golf courses should strongly consider programs such as the

Audubon International Cooperative Sanctuary Program. These programs facilitate appropriate environmental stewardship of a golf course.

For example, the Audubon International Signature Program suggests having drain pipes that carry water from managed areas go through an appropriate filter, vegetative or otherwise, before entering a water body.⁸

Issue E: Education of Neighbors along the Corridor

Residences, businesses and agricultural interests located along the River are not always managed to increase wildlife habitat values and to decrease negative impacts on wildlife. Additionally, these entities are often uninformed about aspects of being wetland neighbors such as mosquitos and native vegetation.

Recommendation

E1. There should be an active program to educate residents about the value of backyard habitat for wildlife, as well as the destructive impact of domestic pets, e.g., cats on birds. Citizens should be encouraged to participate in programs such as the National Wildlife Federation Backyard Wildlife Habitat Program in cooperation with Wild Birds Unlimited.⁹ Two ideas from this program

⁸ See www.audubonintl.org for more information on Audubon International's Cooperative Sanctuary System and Signature Programs. (Note: Audubon International is a completely separate private non-profit organization from National Audubon Society or any local Audubon Society in Utah.)

⁹ See www.wbu.com/alliances. Also Bonneville RC&D (Resource Conservation and

are to 1) include appropriate native plants in a backyard landscape; and, 2) cut a homeowner's lawn in half, since lawns are high maintenance and low in value for wildlife. Additionally, Cats Indoors! is a campaign for safer birds and cats that was recently launched by the American Bird Conservancy.¹⁰ Cats Indoors has prepared educational materials on the impact of cats on wildlife, particularly on birds, as well as on how to convert an outdoor cat into a contented indoor pet.

Also, the Jordan River Environmental Education Program by Great Salt Lake Audubon could make this and other relevant information available to citizens along the Jordan River.

Issue F: Pre-treatment of Stormwater Runoff or Other Non-point Discharges

While the section on Water Quality notes water quality impairments to the Jordan River include resource extraction, reservoir releases, urban runoff, agriculture and recreation, the recommendations of this Plan only address urban runoff and agriculture. With increased urbanization, increased levels of polluted stormwater runoff is finding its way to the Jordan River. Natural wetlands that receive these waters are or could be overloaded in their ability to handle increased pollutant loads, causing degradation of the wetlands.

Development) has a backyard conservation program that could be utilized.

¹⁰ See www.abcbirds.org.

Recommendation

F1. Municipalities responsible for stormwater runoff should strive towards pre-treatment of stormwater runoff before it enters currently functioning wetlands and the Jordan River. An example of using wetlands to improve water quality is the Salt Lake City Water Reclamation Plant wetlands located at 1365 West and 2300 North.

F2. With the creation of the Jordan River Natural Conservation Corridor, manage grazing and restore native vegetation to reduce the amount of erosion, and consequently, soil entering the river.

Issue G: Lack of Information Regarding the Jordan River

There is substantial and growing literature on the Jordan River with many different interests trying to accomplish valuable projects, but there is no central place where this information is accumulated or available.

Additionally, there is inadequate infrastructure to deliver information about the Jordan River and other natural resources.

Recommendation

G1. The U.S. Fish and Wildlife Service, Mitigation Commission, Utah, Salt Lake and Davis Counties, and other interested entities should agree upon a central repository for the information collected regarding the Jordan River. This information would be available to the public and to professionals.

G2. A website could be made available to provide baseline information regarding the Natural Conservation Corridor. Some of the

baseline information that should be on the website includes: 1) where the reserved projects are located; 2) what native vegetation is recommended for planting and where it can be obtained; and, 3) where to get additional information.

G3. The GIS database created with the development of this Plan should be updated when acquisitions to the Natural Conservation Corridor are made.

G4. Three locations along the Jordan River should be established as major public environmental education interpretive sites. Recommended sites include:

At the beginning of the Jordan River, such as at Inlet Park. Some preliminary plans have been discussed for this area. Somewhere in the middle of Salt Lake Valley, by one of the reserved sites at 9000 South, 10600 South or 12300 South. South Jordan and West Jordan Cities have both expressed an interest in this possibility. Currently there is not a major nature center for Salt Lake County citizens.¹¹

Farmington Bay Waterfowl Management Area is developing plans for an interpretative center.

Development of interpretive messages at these areas should incorporate themes and messages developed in the *Greater Great Salt Lake Ecosystems Wetlands Education Plan*.¹²

Issue H: Management of the River Corridor as a Public Trust

Sovereign lands of the Jordan River are managed by the Utah State Division of Forestry, Fire and State Lands as a public trust for the citizens of Utah, but there are many ways that this management might be improved.

Recommendations

H1. All landowners along the Jordan River should understand that the Division is attempting to define exactly the state's ownership claim of the riverbed and that this claim may be based on the natural movement of the river or rechanneling.

H2. Whenever there is a proposal that impacts the Jordan River streambed, the Division must be contacted and proper easements, permits or leases must be obtained if the proposal is to go forward.

H3. The Division should be encouraged to fully implement their trust responsibilities of providing better navigation on the River as

facility is not equipped to handle a large number of people.

¹² This education plan is available at www.utahwetlands.org.

¹¹ The Environmental Center on the Jordan River in Murray City already serves as a smaller site primarily for Murray City School District. This

well as recreation, preservation and public access.

H4. The possibility that the trust responsibilities for the Jordan River include provision for a minimum in-stream flow should be fully explored.

Issue I: Information on the Tributaries is Important Tributaries to the Jordan River are also important corridors for wildlife. While such study was beyond the scope of this Report, it is a logical next step to enlarge the investigation of the Jordan River system to include the tributaries.

I1. Study the interrelationship between wildlife use of the main Jordan River and its tributaries.

APPENDICES

APPENDIX A

MAPS OF RESERVED, UNDECIDED, NATURE PARKS AND OPEN AREAS, JORDAN RIVER PARKWAY TRAIL, MEANDER CORRIDOR AND WETLANDS

Included in this appendix are eight maps covering the entire length of the Jordan River. Preceding each map is a narrative regarding that highlighted section of the river.

The main purpose of these maps is to highlight existing or potential sites that fit into the concept of a Jordan River Natural Conservation Corridor. Open space areas such as golf courses and parks, as well as the Jordan River Parkway Trail, are also presented. Note: where the Jordan River Parkway Trail is identified on Maps A1-A7 should be regarded as the approximate location but not as fully reliable nor complete.

The map for Utah County (A1) provides information, supplied by Utah County, about wetlands and floodplains. Maps for the area extending from the Utah County/Salt Lake County border to 2100 South in Salt Lake County (A2-A6) provide information about wetlands identified by the Wetlands Advanced Identification Study (WAIDS)¹, as well as the meander corridor in Salt Lake County. Map A8 provides information about the current Jordan River as it enters Farmington Bay and also includes the former Jordan River delta northwest of the Salt Lake City International Airport.

Narratives for each map includes general information about the wetland and wildlife value of the area. Major human uses of the area are provided as well as city and county jurisdictions for the particular map. Abbreviated information regarding specific areas highlighted on the maps and additional summary information on major areas with high natural conservation objectives is also given.

Note: These maps are intended as general descriptors. They should not be relied upon for exact boundary locations or acreages. Also, stated purposes for the various properties may change over time.

Below are definitions for the main classifications on the maps:

¹ The WAIDS Study evaluated 22 Basins. Rankings for wetland basins were based on values assigned to nine different wetland functions for each basin. The wetland functions were: groundwater discharge, flood storage, shoreline anchoring, sediment trapping, pollutant retention, food chain support, fishery habitat and wildlife habitat. The values were then summed in order to prioritize wetland basins. These rankings were based on a one year study completed in 1987 and should be viewed as general indicators of importance that could change with additional information.

Reserved Areas managed by deed restriction or ownership primarily for native vegetation, wildlife and/or wetland purposes. Human uses may occur on the land, such as a trail, but these uses are secondary, limited and generally discouraged. These lands include parcels owned by the Utah Reclamation Mitigation and Conservation Commission, wetland mitigation sites that have been permitted by the U.S. Army Corps of Engineers or lands that have a conservation easement placed on them.

Nature Parks Areas that are managed for vegetation, wildlife and/or wetland values in combination with designated trails and/or visitation of the area for wildlife viewing, nature appreciation, hunting (for areas by the Great Salt Lake), etc.

Undecided Areas that have been included in project proposals to become part of a reserved, nature park or open area. Final determination depends on the willingness of the landowner to sell the land at a negotiated price for this purpose, or to provide for the use as a reserved, nature park, or open area by some other type of formal agreement, such as a conservation easement.

Open Areas that are primarily for human use, and have limited infrastructure or buildings such as golf courses and parks. These lands may and often do provide some natural values and could be modified to provide more, but that is not their primary use.

The maps and narratives attempt to highlight areas of at least one acre that fit the classifications provided above. There are, however, various sites that are part of the conservation corridor that are of smaller size or for other reasons were not placed on the maps. The following are examples of this:

A. Mitigation sites, permitted by the U.S. Army Corps of Engineers, of less than one acre in size. These sites, which are listed below should be viewed as reserved sites, although they are small. Since these areas are not placed on the individual maps, they are listed below.

1. PN 199250316 (4/97); Mitigation on the Jordan River to the west and south of Bangerter Highway; .5 acres.
2. 199750024 (not completed); 10000 South and 700 West; mitigation would be to the west side of existing wetlands at the property location; .21 acres.
3. PN 9748 (10/6/87); South Valley Water Reclamation; crossing of the Jordan River
4. PN 199750021; 6400 South and the Jordan River; less than one acre (.68) was impacted for construction of Jordan River Boulevard. Improvements were made to the west bank of the Jordan River going south of 6400 South for 1,500 feet.

5. PN 199750357; 4800 South and west of the Jordan River; storm control for Ivory Homes: .04 acres.

6. PDN 199250118; 1300 West extension project between 3300 and 3400 South; on the west side of the River where .20 acres were restored.

7. PN 19900954; 3000 South substation for Utah Power and Light on the west side of the River.

B. Under Section 206, Ecosystem Restoration Projects, U.S. Army Corps of Engineers, about 14 acres of habitat at 20 different sites along the river is proposed to be created (United States Army Corps of Engineers, Sacramento District. 2000).

C. Public works departments, water conservancy districts and canal companies maintain some areas for flood control or water delivery. Generally, these sites were not listed. Although these lands may be owned by public entities, their purpose is not for general public use and their future use by wildlife cannot be guaranteed. For example, a Salt Lake County desilting basin and property owned by Salt Lake City in Utah County are not shown on the maps.

D. In many cases the trail for the Jordan River Parkway is placed on the maps. However, the land owned for the parkway is often not always identified on the maps since it is frequently a narrow strip of land.

UTAH COUNTY MAP A1

SUMMARY OF THE AREA

This area contains significant value for wetland and wildlife habitat. A rough estimate indicates that over two square miles, or 1,360 acres, by the Jordan River and Utah Lake is in the floodplain. This means these lands are below elevation 4,495 feet, which is the floodplain elevation for Utah County. Utah County's Flood Plain overlay zone does not allow any structures to be built below this elevation. Also, over roughly one square mile, or 640 acres, are considered wetlands according to the National Wetlands Inventory of 1984. There are specific areas in Utah County that are either reserved, nature parks or open space.

The major human uses include agriculture, the Thanksgiving Point Golf Course and the Jordan Parkway Trail, which runs nine miles from Utah Lake to the Jordan Narrows. The area is becoming increasingly urbanized. There are three roadways (9600 North, State Highway #73 - 8570 North and Saratoga Road) that cross the Jordan River in Utah County.

The River in this area goes through or by the cities of Saratoga Springs and Lehi.

SPECIFIC AREAS

Areas	Acreage	Status	Ownership
Inlet Park	15 acres (approx.) 12 acres (approx.)	Nature Park Open	Utah County
Wetlands Park	25 acres (approx.) 26 acres (approx.)	Nature Park Open	Utah County
Willow Park	84 acres	Open	Utah County
Wildlife Park	23 acres	Reserved	Utah County
Thanksgiving Point Golf Course	120+ acres	Open	Private Golf Course
Indian Ford Park	10 acres 8 acres	Nature Park Open	Utah County

Areas	Acreage	Status	Ownership
Trail Along the River	88 acres	Open	Utah County

ADDITIONAL INFORMATION ON THE MAJOR AREAS WITH HIGH NATURAL CONSERVATION OBJECTIVES/POTENTIAL

Inlet Park: This 27-acre property owned by Utah County borders the sovereign lands of Utah Lake. Roughly 12 acres serves as a park and 15 acres serves as a nature park. Inlet Park has wetland vegetation and borders the wetland vegetation of the sovereign lands of Utah Lake. This area could be used for interpretation and is a key beginning to the Jordan River Natural Conservation Corridor. The Park includes a parking lot and serves as a connection to the Jordan Parkway Trail.

Wetlands Park: This approximately 51-acre area is owned by Utah County. About 26 acres serves as a model airplane airport, parking lot and trail. Also there are approximately 25 acres that are undeveloped and serve as a nature park.

Willow Park: This 84-acre property serves as a park for Utah County. There is overnight camping, day park facilities, canoeing access to the river and the trail. About 20 acres are not currently developed, but plans for this area include group camping sites.

Wildlife Park: This 23-acre area owned by Utah County was created as a wetland reserved area when the Jordan River was dredged in the 1980's. The trail goes through the area.

Indian Ford Park: This 18+ acre area is owned by Utah County. It includes a park area and the trail of about 8 acres. There is also a nature park that is primarily wetlands of about 10 acres.

Jordan River Natural Conservation Corridor

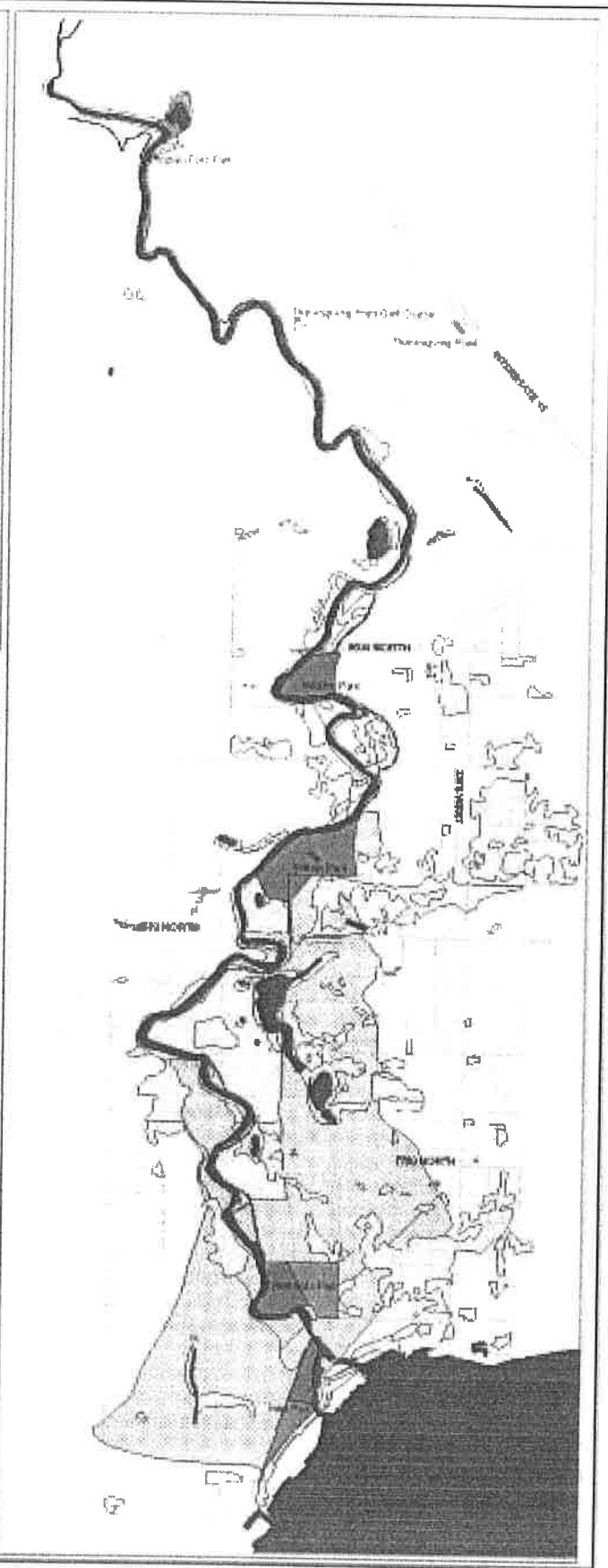
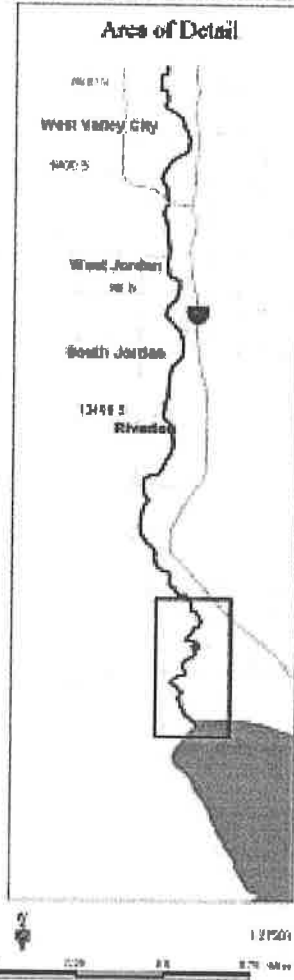
Map A-1 Utah County



Legend

- Jordan River
- Paved Trail
- Golf Courses
- Natural Areas
- Undeveloped
- Reserved
- Open
- Flood Zones
- Wetlands

Area of Detail



THE NARROWS TO BANGERTER HIGHWAY MAP A2

SUMMARY OF THE AREA

This area contains significant value for wetland habitat,² although at this time no areas have been specifically set aside as reserved areas or nature parks. Currently, none of these acres are protected.

The major human uses include agriculture, gravel mining, and irrigation canals coming out of the Narrows. There is increasing potential for housing near the river. The only roadway besides Bangerter Highway is at 14600 South. At this point, there is a short connecting trail to the trail in Utah County.

The River in this area goes through Bluffdale, Riverton, and Salt Lake County boundaries.

SPECIFIC AREAS

Areas	Acreage	Status	Ownership
O1 - Upland, dry above river	53 acres on west side	Open	Salt Lake County
O2 - Upland, dry above river	36 acres on east side	Open	Salt Lake County
U1 - Old power corridor	Over 10 acres along with U2 on Map A3	Undecided	Utah State Parks

ADDITIONAL INFORMATION ON THE MAJOR AREAS WITH HIGH NATURAL CONSERVATION OBJECTIVES/POTENTIAL

Although the Jordan Narrows and the area between 14600 South and Bangerter Highway have very high potential, they are not specifically managed for native vegetation, wetlands and wildlife, nor are there specific proposals to manage these areas as reserved or natural areas at this time.

² The WAIDS study ranked 68 acres in Basin 1 as #4 and 62 acres in Basin 2 as #17. A portion of Basin #3 is south of Bangerter Highway. Basin 3 contained 388 acres and was ranked as #1.

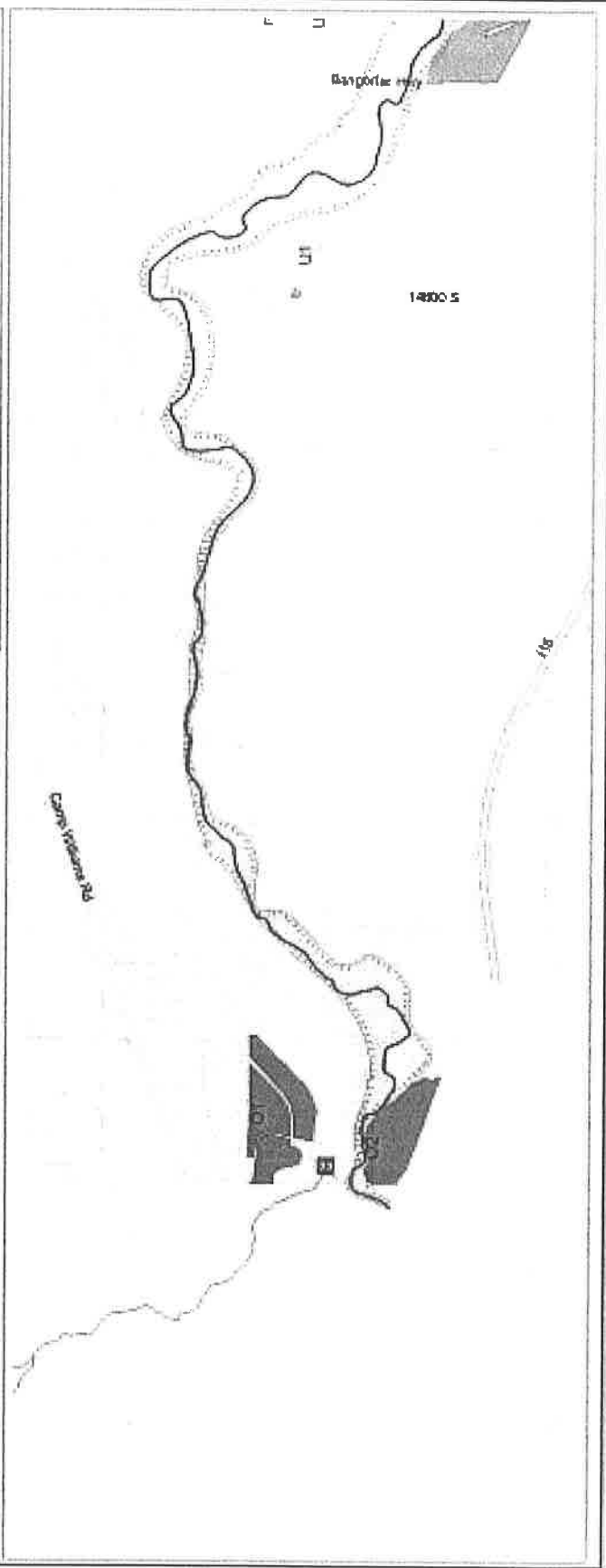
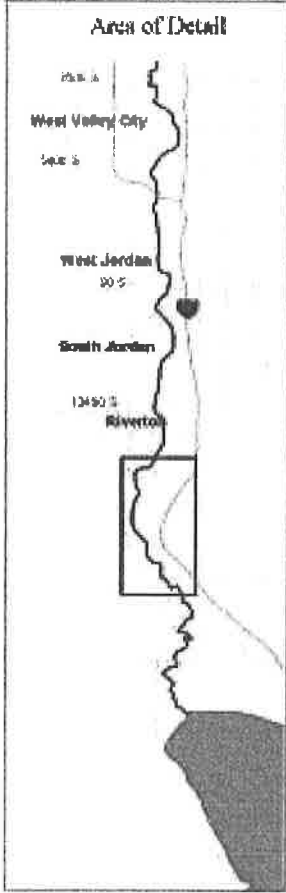
Jordan River Natural Conservation Corridor

Map A2 The Narrows to Bangerter Highway



Legend

- Jordan River
- Meander Corridor
- Other Streams
- Existing Trail
- Proposed Trail
- Trailheads
- Golf Courses
- WAOS (wetlands)
- Nature Parks (N)
- Undecided (U)
- Reserved (R)
- Open (D)



BANGERTER HIGHWAY TO 9800 SOUTH MAP A3

SUMMARY OF THE AREA

This area contains significant value for wetland habitat¹ and has significant areas that have been or could be reserved as part of the Natural Conservation Corridor. Currently, this area has the greatest acreage in either reserved or in nature park status in Salt Lake County, except for the areas north and west of I-215 by the Great Salt Lake.

Major human uses include the Riverbend Golf Course, the Jordan Parkway Trail, housing, businesses, Mulligan's Golf Course, City Parks and agriculture. The three road crossings are at Bangerter Highway, 12300 South, and 10600 South.

The Jordan River in this area goes through Riverton, Draper City, South Jordan City and Salt Lake County boundaries.

SPECIFIC AREAS

Areas	Acreage	Status	Ownership
R1 - Colby Property	81 acres	Reserved	Mitigation Commission
R2 - Permitted Mitigation Site	25+ acres	Reserved	Private

¹ The WAIDS rankings were: Part of Basin 3, which totaled 388 acres, ranking #1 (the other portion is south of Bangerter Highway), Basin 4, 213 acres, ranking #3 (much of this area is either preserved, a nature park or open space); Basin 5, 68 acres, ranking #11; Basin 6, 45 acres, ranking #16; Basin 7, 47 acres, ranking #12 (this area is basically the proposed South Jordan River Riverway Enhancement Project); Basin 8, 16 acres, ranking #22 (this area contains the proposed Development in South Jordan on the west side of the River and south of 10600 South); Basin 9, 76 acres, ranking #13 (this area contains the Great Salt Lake Audubon - TreeUtah Project); Basin 10, 35 acres, ranking #19 (this area contains Mulligan's Golf Course); Basin 11, 16 acres, ranking #20.

Areas	Acreege	Status	Ownership
R3 - South Jordan Riverway Enhancement	3 acres	Reserved	South Jordan City
R4 - South Jordan Riverway Enhancement	35+ acres	Reserved	South Jordan Conservation Easement
R5 - South Jordan Riverway Enhancement	16 acres	Reserved	Mitigation Commission
U3, U4 - South Jordan Riverway Enhancement	56 acres	Undecided	Identified for acquisition
R6 - Audubon/Tree Utah	40 acres	Reserved	Mitigation Commission
U5 - Audubon/Tree Utah	33 acres	Undecided	Identified for acquisition
N1 - River Bend Nature Area	100 acres (approx.)	Nature Park	Salt Lake County
N2 - Riverton Wetlands Area	15+ acres	Nature Park	Riverton
N3 - Permitted Mitigation Site	5+ acres	Nature Park	Private
U1 - Prison Property	252 acres	Undecided	State of Utah
U2 - Old Power Corridor and Other Property	Over 20 acres along with U1 on Map A2	Undecided	Salt Lake County Parks and Recreation
O1 - River Bend Golf Course	100+ acres	Open	Salt Lake County
O2 - Draper City	7 acres (approx.)	Open	Draper City
O3 - City Open Space	18 acres	Open	Details in Army Corps PN 199550496
O4 - Public Space	5+ acres	Open	Details in Army Corps PN 199850341
O5 - Midas Pond	16 acres	Open	South Jordan

Areas	Acreage	Status	Ownership
O6 - South Jordan City Parks, Trail and Mulligan's Golf Course	81 acres Parks and Trail 67+ acres Golf Course	Open	South Jordan

ADDITIONAL INFORMATION ON THE MAJOR AREAS WITH HIGH NATURAL CONSERVATION OBJECTIVES/POTENTIAL

R1 - Colby Property: This is an 81 acre mitigation project for the expansion of I-15 through Salt Lake County combined with a Jordan River project for the Utah Reclamation Mitigation and Conservation Commission, which includes 7 acres obtained from Draper City. A detailed mitigation, monitoring and maintenance plan for this project (except for the 7 acres obtained by Draper City) has been approved by the U.S. Army Corps of Engineers (Public Notice 199350221). Project construction began in 1997 and is complete. The Utah Department of Transportation will maintain and monitor the project through 2002.

R2 – U.S. Army Corps of Engineers Mitigation Site for JDD Homes: This 25+ acre mitigation site was set aside as a result of the development of property just south of the mitigation (PN 199550496).

R3, R4, R5, U3, U4– South Jordan City Jordan Riverway Wildlife Enhancement Project: This 111-acre area along the east side of the Jordan River, south of 10600 South, is a major effort to reserve wildlife habitat for migratory bird populations as part of a Superfund Restoration Plan (Peterson, 1997). The major partners in this effort include South Jordan City, the U.S. Fish and Wildlife Service and the Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission). At present 16 acres owned by the Mitigation Commission is reserved (R5), and 35+ acres is reserved as a result of a conservation easement placed on the property by South Jordan (R4). Also three acres of wetlands are set aside (R3) as a result of a mitigation plan for fill associated with Sterling Village, Army Corps PN 199550669.

R6, U5 – Audubon/TreeUtah Migratory Bird Habitat Restoration Project: This 73-acre area along the east side of the Jordan River, north of 10600 South, is also a major effort to reserve wildlife habitat for migratory bird populations as part of the *Sharon Steel Natural Resource Restoration Plan* (Peterson, 1997). The major partners in this effort include Great Salt Lake Audubon, TreeUtah, U.S. Fish and Wildlife Service and the Mitigation Commission. At present 40 acres are owned by the Mitigation Commission. The remainder of the 33 acres is in private ownership.

N1 - River Bend Nature Area: This approximately 100-acre property is owned by Salt Lake County and under the jurisdiction of Salt Lake county Parks and Recreation. The plan for this area is to manage it as a nature park. A specific management plan has not been developed. The trail goes through the property.

N2 – Riverton Wetlands Area: A management plan is being developed for the area. The land is owned by Riverton City and is being set aside as a nature park. The project is an enhancement associated with the Riverton secondary water system. Riverton City Council has approved the concept of restoring/enhancing the old ox-bows on the property.

N3 – US Army Corps of Engineers Mitigation Site for J&S Land Company: Five plus acres are set aside as a wetland area as part of the Army Corps of Engineers mitigation permit (PN 199850341). The acreage is, or will be owned, by individuals who have purchased, or will purchase, individual lots. Although the area is set aside, due to the use by individual small landowners it probably should be regarded as a private nature park, rather than a reserved area.

U1 - Prison Property: This 252 acre property is owned by the State of Utah. A study *State Prison Property: Wetlands Inventory and Mitigation Feasibility Study*, by Bio/West, Inc., December 1998, provided options for the property. The State (specifically Utah Department of Transportation, in cooperation with others) is currently developing a proposal for this property to be used as a wetlands mitigation bank.

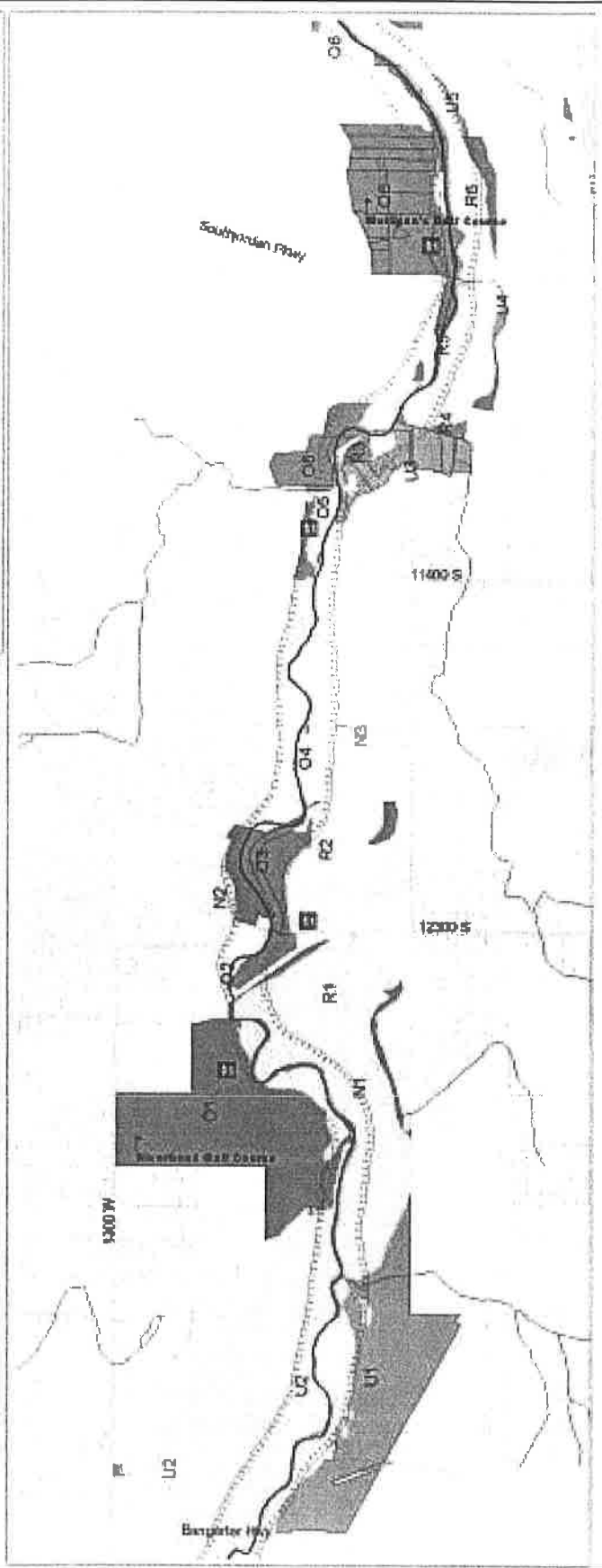
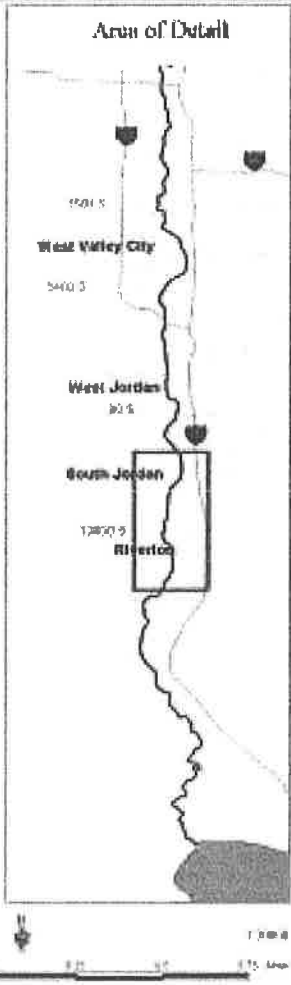
Jordan River Natural Conservation Corridor

Map A3 Bangerter Highway to 9800 S.



Legend

- Jordan River
- Meander Corridor
- Other Streams
- Existing Trail
- Proposed Trail
- Trailheads
- Golf Courses
- WAIDS (wetlands)
- Nature Parks (N)
- Unceded (U)
- Reserved (R)
- Open (O)



9800 SOUTH TO I-215 MAP A4

SUMMARY OF THE AREA

This area contains significant value for wetland habitat and has significant areas that have been or could be reserved as part of the Natural Conservation Corridor.⁴

The major human uses include the Sharon Steel Capping site, the Midvale Slag site, an electrical powerline corridor and substation, a wastewater treatment plant, two golf courses, the Jordan River Parkway Trail, some agricultural uses and housing. There are five road crossings: 9000 South, 7800 South, 7200 South, Winchester Street and I-215.

The River in this area goes through West Jordan, Sandy, Midvale, Murray, Taylorsville and Salt Lake County.

SPECIFIC AREAS

Areas	Acreeage	Status	Ownership
R1,N1 - River Oaks Golf Course	11 acres	Reserved and Nature Park	Private golf course, includes mitigation
R2 - Permitted Mitigation Site	4.4 acres	Reserved	Private
R3 - West Jordan Restoration Project	12 acres	Reserved	Mitigation Commission
R4 - West Jordan Restoration Project - Permitted Mitigation	6 acres	Reserved	Private
R5 - Permitted Mitigation Site	13.4 acres	Reserved	Private

⁴ The WAIDS study ranked 17 acres in Basin 12 as #18 (this area includes the River Oaks Golf Course); 0 acres in Basin 13 as # 21 (this area includes the River Oaks Golf Course); 161 acres in Basin 14 as #5 (this area includes the City of West Jordan Natural Habitat Project, the Fur Breeders Mitigation Project and the Sharon Steel Restoration Project Wetlands Area); 94 acres in Basin 15 as #6 (this includes the waste water treatment plant); 5 acres in Basin 16 as #14 (the Murray City Golf Course is located in this area); 19 acres in Basin 17 as #19 (Murray City Whinchester Park, trail and wetlands area).

Areas	Acreage	Status	Ownership
U1 - West Jordan Restoration Project	76 acres	Undecided	Identified for acquisition
N2 - Whinchester Park	16.2 acres	Nature Park	Murray City
N3 - Cottonwood Grove Park	19 acres	Nature Park	Murray City
U2 - Sharon Steel Restoration Project Wetlands Area, east of River	10 acres (approx.)	Undecided	Private
O1 - South Jordan City Park (also listed as O6 on Map A3)	16.6 acres	Open	South Jordan
O2 - River Oaks Golf Course	100+ acres	Open	Private
O3 - Murray City Golf Course	137.5 acres	Open	Murray City

ADDITIONAL INFORMATION ON THE MAJOR AREAS WITH HIGH NATURAL CONSERVATION OBJECTIVES/POTENTIAL

R1, N1 - River Oaks Golf Course The River Oaks Golf Course is a privately owned golf course that includes mitigation permitted by the U.S. Army Corps of Engineers (Public Notice 199450081). River Oaks Golf Course has set aside wetland acreage that is next to the golf course that could be considered a reserved area. River Oaks has also set aside and created riparian and wetland habitat that is considered a nature park.

R2 – Permitted Mitigation Site These 4.4 acres on the east side of the Jordan River are part of the mitigation for the Fur Breeder’s property (See R4 as well) by the U.S. Army Corps of Engineers (PN 190209692).

R3, R4, U1 – City of West Jordan Natural Habitat Restoration Project This approximately 90 acre area along the west side of the Jordan River, between 8000 and 9000 South, is a major effort to reserve wildlife habitat for migratory bird populations as part of the *Sharon Steel Natural Resource Restoration Plan* (Peterson, 1997). The major partners in this effort include West Jordan City, the U.S. Fish and Wildlife Service and the Utah Reclamation Mitigation and Conservation Commission. At present, 12 acres (R3) are owned by the Mitigation Commission and 6-acres (R4) are a mitigation site approved by the U.S. Army Corps of Engineers Mitigation site for the Fur Breeders property (PN 190209692).

U2 – Sharon Steel Restoration Project Wetlands Area, East of the River This 10 acre wetland site is part of the site restoration of Sharon Steel and is a separately funded project from the South Jordan, Audubon/TreeUtah or West Jordan projects. The design and planting of this project is complete, but the management plan, as well as the long-term maintenance and operation of the project have not been finalized. This site is privately owned. The project is overseen by the Utah Department of Environmental Quality and EPA.

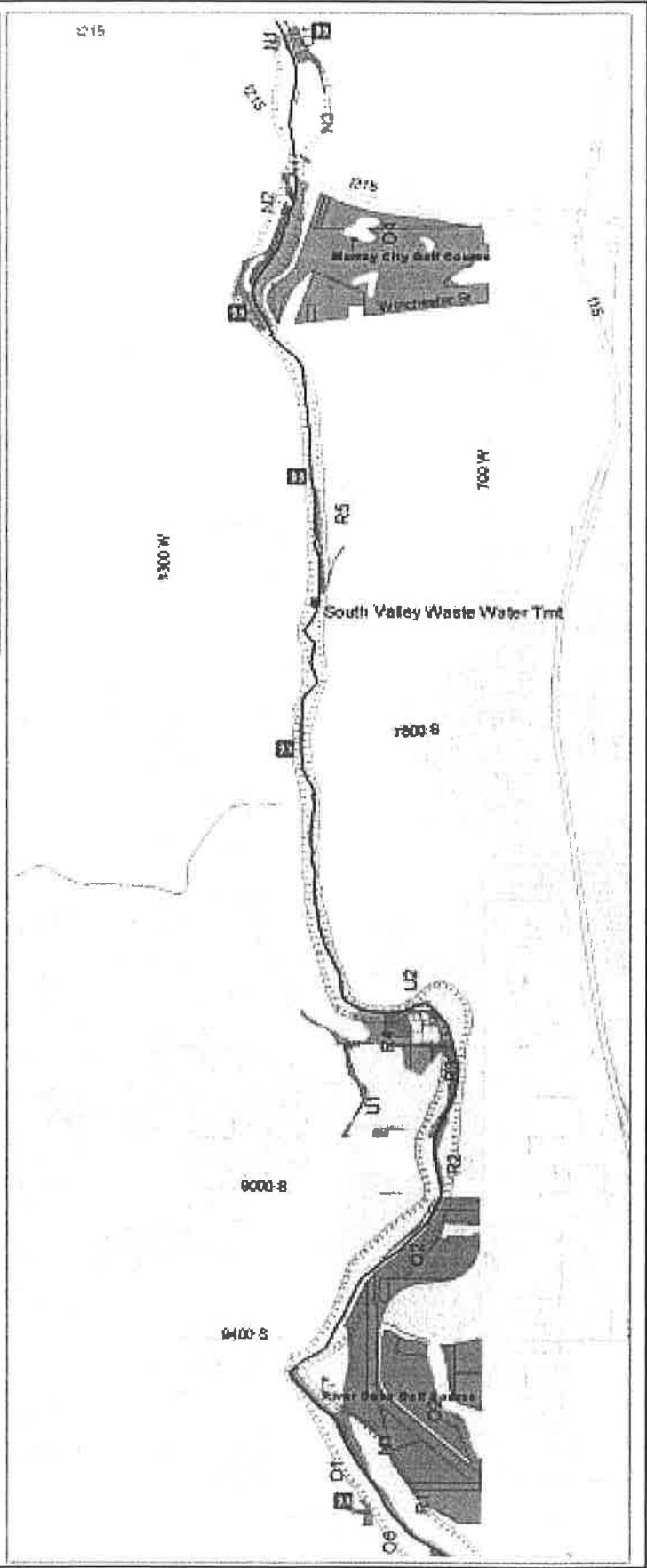
N2 – Murray City: Winchester Park This area includes wetland areas, a parking lot and the trail.

N3 - Murray City: Cottonwood Grove Park This area includes the trails, but otherwise, it is fairly open. The most developed section of this park is labeled O1 on Map A5.

Jordan River Natural Conservation Corridor



Map A4 9800 S. TO I-215 (6200 S.)



**I-215 (6200 SOUTH) TO 2400 SOUTH
MAP A5**

SUMMARY OF THE AREA

This area contains significant value for wetland habitat⁵ and has significant areas that have been or could be reserved as part of the Natural Conservation Corridor. Murray City has completed extensive work for parks, trails and nature parks. The entrance of Little Cottonwood Creek and Big Cottonwood Creek into the Jordan River add additional habitat. Furthermore, there is the Little Dell Mitigation site on both sides of 3900 South.

The major human uses include housing by the river, parks, the Meadow Brook Golf Course and the Central Valley Waste Water Treatment Facility. The trail is mostly complete. There are five roadways in this area which cross the river: 5400 South, 4800 South, 4500 South 3900 South and 3300 South.

The river in this area goes through Murray, Taylorsville, West Valley City, South Salt Lake and Salt Lake County.

SPECIFIC AREAS

Areas	Acreage	Status	Ownership
R1 - Cottonwood Valley Partnership N2 - Germania Park	7 acres (approx.) 3 acres (approx.)	Reserved Nature Park	Private Murray City
R2 - Salt Lake County and City Little Dell Mitigation	60+ acres	Reserved	Salt Lake County
R3 - Army Corps of Engineers Mitigation	1 acre	Reserved	Private
N1 - Salt Lake County Fish and Game	1 acre	Nature Park	Private

⁵ The WAIDS rankings were 91 acres in Basin 18 at #10 (Salt Lake County Fish and Game Association property and Murray City Cottonwood Grove and Walden Parks and trail); 73 acres in Basin 19 at #2 (Murray City Germania and Arrowhead Parks, trail and wetlands area); 41 acres in Basin 20 at #9; 94 acres in Basin 21 at #8 (includes the Little Dell Mitigation area); 325 acres in Basin 22 at #7 (includes the area from 3300 South to 2100 South and the Redwood Nature Park).

Areas	Acreage	Status	Ownership
N3 - State Lands	9+ acres	Nature Park	State of Utah (managed by Forestry, Fire and State Lands)
N4 - Arrowhead Park and Environmental Center	17.5 + 2 acres	Nature Park	Murray City
N5 - Redwood Nature Area	55 acres	Nature Park	Salt Lake County
O1 - Cottonwood Grove Park	2 acres	Open	Murray City
O2 - Walden Park	16.3 acres	Open	Murray City
O3 - Germania Park	48.4 acres	Open	Murray City
O4 - Arrowhead Park	1.7 acres	Open	Murray City
O5 - Trailhead	2+ acres	Open	Salt Lake County
O6 - Meadowbrook Golf Course	177 acres	Open	Salt Lake County
O7 - James Madison Park and Trail	6 acres (approx.)	Open	Salt Lake County
O8 - Millcreek Mouth and Oxbow	8+ acres	Open	Salt Lake County
O9 - Redwood Trailhead Park	7 acres	Open	Salt Lake County

ADDITIONAL INFORMATION ON THE MAJOR AREAS WITH HIGH NATURAL CONSERVATION OBJECTIVES/POTENTIAL

R1, N2 – Cottonwood Valley Partnership and Murray City Germania Park The Army Corps of Engineers (Public Notice 8508A, May 17, 1984) shows a 7 acre mitigation site from north of 4500 South to north of the entrance of Big Cottonwood Creek into the Jordan River. Part of the mitigation was to create additional wetlands, which failed. Murray City created three acres of wetlands in the Germania Park to compensate for the failed wetland creation. (Note: Due to the heavy use of the Murray Parkway, the mitigation site in Germania Park is shown as a nature park and is labeled N2).

R2 – Salt Lake County and City Little Dell Mitigation Project This approximately 60 plus acre mitigation site is in three components, all bordering 3900 South. Site 2A is east of the Jordan River and north of 3900 South. Site 2B is west of the Jordan River and north of 3900 South. Site

2C is west of the Jordan River and south of 3900 South. In 1986 a local cost share agreement between Salt Lake City, Salt Lake County and Salt Lake County Metropolitan Water District established the mitigation. In 1995 the mitigation was considered a success. At present, efforts are being made to ensure appropriate long-term operation and maintenance of the site.

R3 – U.S. Army Corps of Engineers Mitigation This 1.2-acres mitigation site is immediately west of the Jordan River at 3300 South 1700 West. About half of this site is open water. This site is permitted under PN 199550320 and is called the Richard Paras Wetland Mitigation Project.

N1 – Salt Lake County Fish and Game Association This one acre wetland area is owned by a private non-profit organization. The intent of Salt Lake County Fish and Game is to keep the area as a wetland in perpetuity.

N3 – State Lands This is a 9+ acre parcel owned by the State of Utah and managed by the Utah Division of Forestry, Fire and State Lands as part of the sovereign lands of the Jordan River. It is located on the west side of the River and south of 4800 South. There is not a specific management plan for this parcel at this time.

N4 – Murray City: Arrowhead Park and Environmental Center Arrowhead Park includes Little Cottonwood Creek as it enters the Jordan River. It includes substantial wetlands. The trail is on a boardwalk through much of the area. Also, at the southerly end of Arrowhead Park is the Environmental Center.

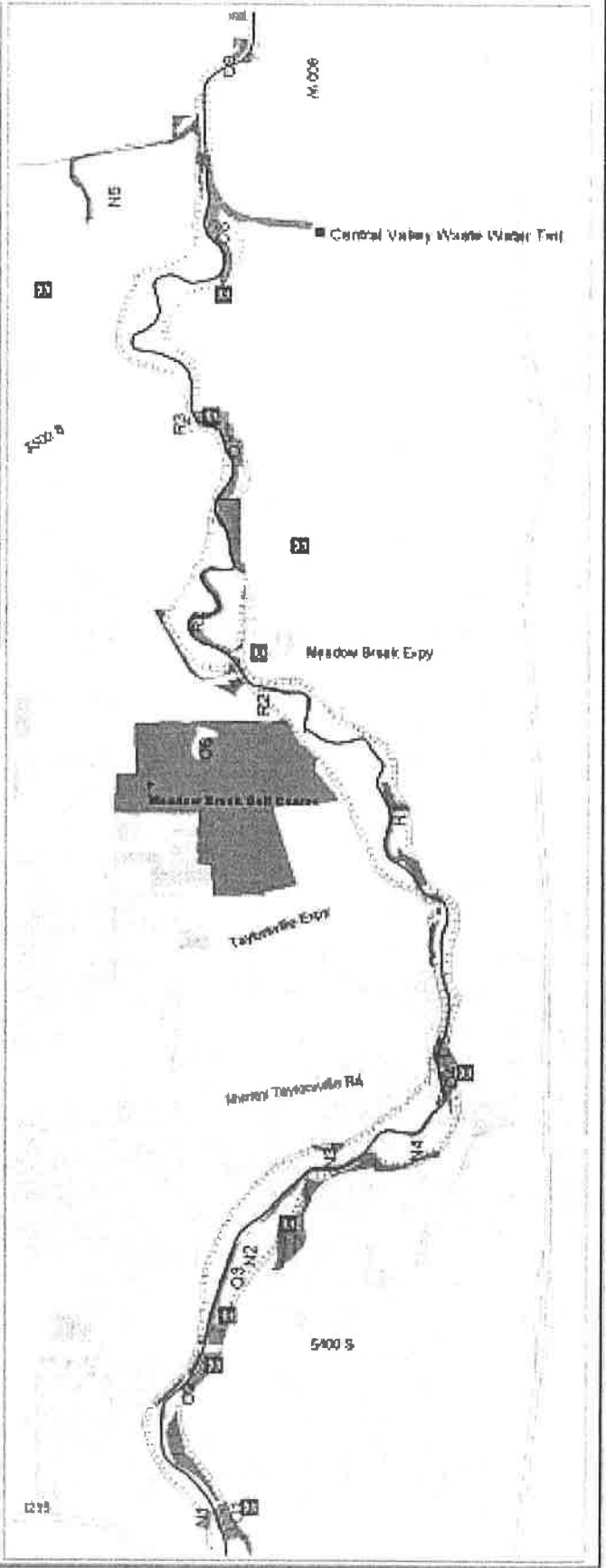
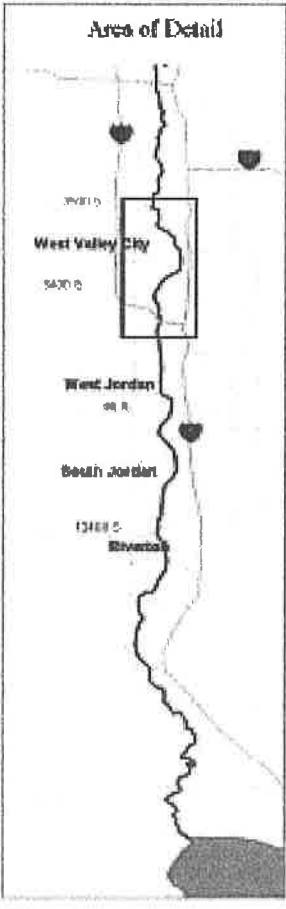
N5 – Salt Lake County Redwood Nature Area This area is on the west side of the River between 3300 South and roughly 2700 South. Much of this 55-acre area is wetlands. It is owned by Salt Lake County and under the jurisdiction of Salt Lake County Parks and Recreation. There are trails going through the area. There have been plantings in the area by TreeUtah. A preliminary design for the area was developed years ago, but there are no specific management plans at this time.

Jordan River Natural Conservation Corridor

Map A-5 1-215 (6200 S.) to 1-80 (2400 S.)

Legend

- Jordan River
- Meander Corridor
- Other Streams
- Existing Trail
- Proposed Trail
- Bridges
- Trailheads
- Golf Courses
- WAIDS (wetlands)
- Natural Areas
- Undecided
- Reserved
- Open



2400 SOUTH TO 1000 NORTH MAP A6

SUMMARY OF THE AREA

This area contains some wetland and wildlife values.⁶ From 2100 South to approximately 1900 North is the most highly urbanized and controlled section of the Jordan River Corridor. This is particularly true because of the Surplus Canal, which takes much of the water from the Jordan River and directs it towards the northwest. The canal provides some assurances that the current Jordan River will not flood north of approximately 2000 South.

The major human uses include housing, Glendale Golf Course, parkway, and industrial sites. The trail is largely completed in this area. There are 14 road crossings in this area, which are State Highway 201, 2100 South, 1700 South, 1300 South, Indiana Avenue, 500 South, 400 South, 300 South, I-80, 200 South, North Temple, 500 North, 600 North and 1000 North.

The River in this area goes through West Valley City, South Salt Lake and Salt Lake City.

SPECIFIC AREAS

Areas	Acreage	Status	Ownership
N1- River Bend Nature Area	2 acres (approx.)	Nature Park	Salt Lake City
N2 - Nature Study Area at the Day Riverside Library	5+ acres	Nature Park	Salt Lake City
O1 - Park	5 acres (approx.)	Open	South Salt Lake City
O2 - Glendale Golf Course, Park, and Raging Waters	150 acres (approx.)	Open	Salt Lake City
O3 - 17 th South Park ⁷	17 acres	Open	Salt Lake City
O4 - Jordan Park and Peace Gardens	33.5 acres	Open	Salt Lake City

⁶ A small portion of Basin 22 is included from 2400 South to 2100 South. The WAIDS study concluded at 2100 South.

⁷ About 40% of this park is in an undeveloped state and options are being considered.

Areas	Acreage	Status	Ownership
O5 - Jordan River Park - 9 th South	4.5 acres	Open	Salt Lake City
O6 - Alzheimer's Garden and Park Area ⁸	.5 acres 2 acres	Nature Park Open	Salt Lake City
O7 - Constitution Park	18 acres	Open	Salt Lake County (Salt Lake City maintains grounds)
O8 - Cottonwood Park and Other Park Areas	15 acres 6 acres	Open	State Parks
O9 - Riverside Park	28.5 acres	Open	Salt Lake City

ADDITIONAL INFORMATION ON THE MAJOR AREAS WITH HIGH NATURAL CONSERVATION OBJECTIVES/POTENTIAL

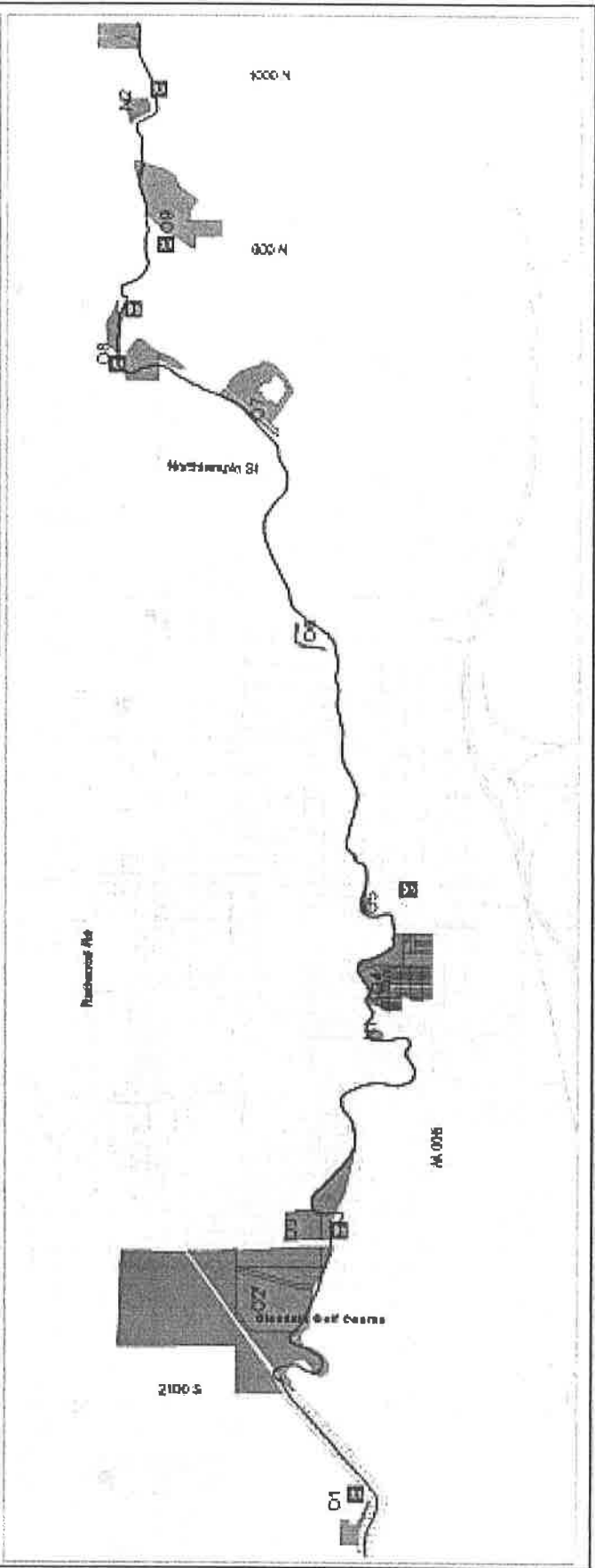
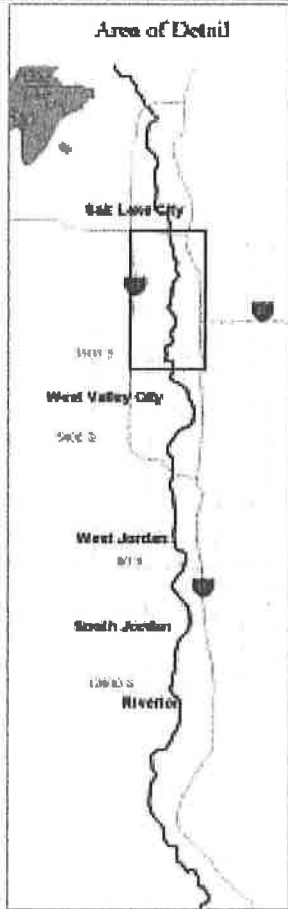
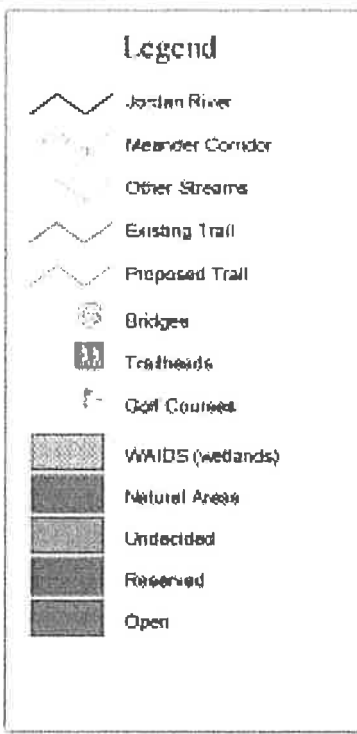
N1 – River Bend Nature Area This two-acre area is owned by Salt Lake City. The development of this area has been a cooperative effort between many partners such as the Bennion Center at the University of Utah, TreeUtah and Salt Lake City Parks. This area serves as a small nature education area in Salt Lake City.

N2 - The Nature Study Area at the Day-Riverside Library This 5+acre site provides the community a unique opportunity to experience natural landscaping similar to what the Jordan River was like 200 years ago.

⁸ Alzheimer's Garden is a .5 acre area planted in native vegetation and serves as a small nature park. An additional two acres are in an undeveloped state.

Jordan River Natural Conservation Corridor

Map A6 1-80 (2400 S.) to 1000 North



1000 NORTH TO DAVIS COUNTY MAP A7

SUMMARY OF THE AREA

This area contains some value for wetland and wildlife habitat and has some areas that have been or could be reserved as part of the Natural Conservation Corridor. The major area specifically set aside for wetlands and wildlife habitat values include parts of Beck Hot Springs and the Salt Lake City Water Reclamation Plant wetlands, which are both south of 2300 North and west of I-15.

The major human uses include the Jordan River Parkway, the Rose Park Golf Course, and nearby housing and businesses (including oil refineries). The trail is complete through this area. There are three road crossings in the area: 1000 North, Redwood Road and I-215.

The River in this area goes through Salt Lake City, North Salt Lake, Salt Lake County and Davis County.

SPECIFIC AREAS

Areas	Acreage	Status	Ownership
R1 - Jordan River State Park	2 acres	Reserved	State Parks
R2 - Army Corps of Engineers Mitigation	2. 8 acres	Reserved	Private
R3 - Salt Lake City Water Reclamation Plant Wetlands	40 acres (approx.)	Reserved	Salt Lake City
R4 - Beck Hot Springs	10 acres (approx.)	Reserved	Private
O1 - Jordan Par 3 Course	20 acres	Open	State Parks
O2 - Rose Park Golf Course	175 acres	Open	Salt Lake City
O3 - Jordan River State Park	300+ acres	Open ⁹	State Parks

⁹ The primary use for this state park is model airplanes and an OHV park.

ADDITIONAL INFORMATION ON THE MAJOR AREAS WITH HIGH NATURAL CONSERVATION OBJECTIVES/POTENTIAL

R1 – Jordan River State Park This two-acre mitigation site permitted by the U.S. Army Corps of Engineers (PN 199100245) runs along the west side of the Jordan River in the property managed by State Parks. The mitigation is required due to filling of wetlands for the construction of, and access to, the model airplane runway.

R2 – Army Corps of Engineers Mitigation Site This is a 2.8-acre mitigation site currently owned by TNT Auction Yard. It is on the east side of the Jordan River at approximately 2300 North. The Public Notice for this site is #199350283.

R3 - Salt Lake City Water Reclamation Plant Wetlands This approximately 40 acre wetland site uses a daily average of three million gallons of treated reclamation plant effluent. There is about 1.25 miles of free flowing channel. There is an observation deck for wildlife viewing, which is accessible during business hours.

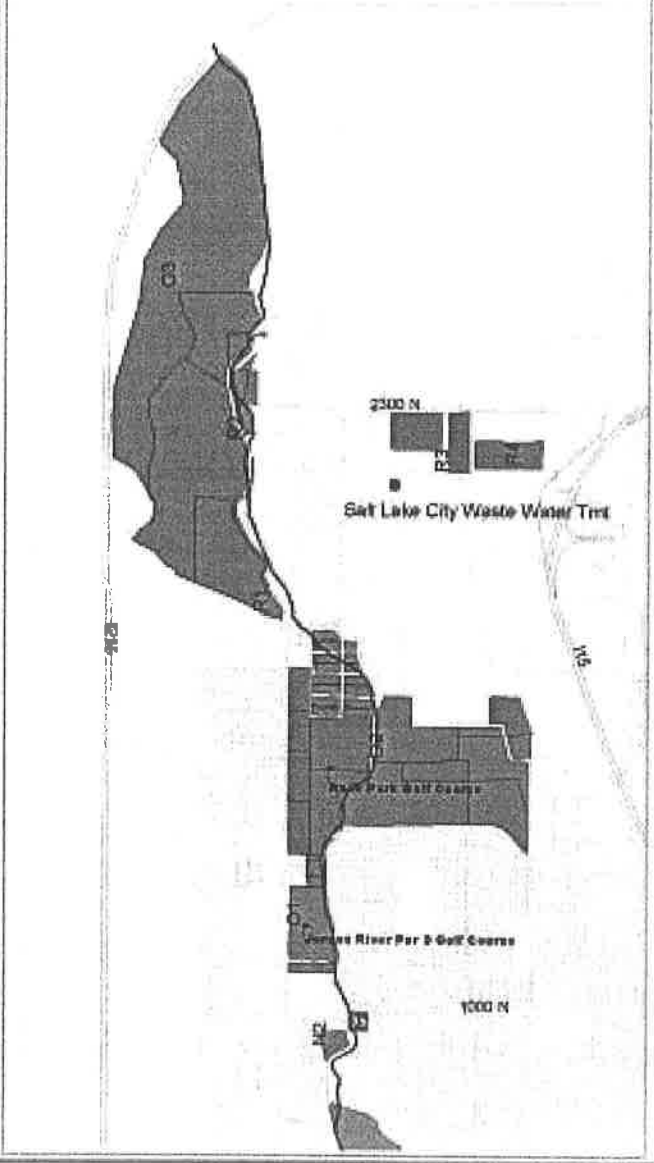
R4 - Beck's Hot Springs This approximately 10-acre area was permitted by the EPA. The original application for partial fill of the area was made to the Army Corps of Engineers (Public Notice 9836, dated 2/10/88). Historically, there was a hotel by Beck's Hot Springs, the water was bottled and sold for medicinal purposes. The area was used as a bathing resort and there were fish in Hot Spring Lake (*Major Thermal Springs of Utah*, 9/1970 and *Ground Water in the Jordan Valley Utah*, 1949).

Jordan River Natural Conservation Corridor

Map A7 1000 North to Davis County



- Legend**
- Jordan River
 - Meander Corridor
 - Other Streams
 - Existing Trail
 - Proposed Trail
 - Bridges
 - Trailheads
 - Golf Courses
 - WADIS (wetlands)
 - Natural Areas
 - Undecided
 - Reserved
 - Open



NORTH AND WEST OF I-215 BY GREAT SALT LAKE MAP A8

SUMMARY OF THE AREA

The Jordan River currently runs north and west of I-215 and west of Redwood Road and enters the Great Salt Lake at Farmington Bay Waterfowl Management Area. This area contains significant value for wetland habitat and has significant areas that have been or could be reserved as part of the Natural Conservation Corridor.

The major human uses are agriculture, duck clubs and the Farmington Bay Waterfowl Management Area. There are two road crossings I-215 and Center Street in North Salt Lake. Currently, there is no trail in this area. There is the potential for increasing human development, even though the Jordan River flooded south of I-215 during flooding of the Great Salt Lake in the 1980's.

The river in this area goes through North Salt Lake, Davis County and Salt Lake County.

At one time the Jordan River entered the Great Salt Lake much farther to the west, out towards Lee's Creek and Saltair. Over time the Jordan River has shifted to the north and east, creating numerous old river delta areas. The Surplus Canal, which branches off from the Jordan River at approximately 2000 South takes water towards these old deltas creating significant wetland habitat, much of which is now managed for wildlife, and/or mitigation. The location of these areas are: to the west of I-215, or more specifically those areas north of I-80 and west and north of the Salt Lake International Airport.

The major human uses of this old Jordan River channel include industrial areas by the surplus canal, flood control, the Salt Lake International Airport, the International Center and a golf course. However, once the Surplus Canal extends west of the airport, the major uses in the area are for grazing, agriculture, wetlands and wildlife. After the Surplus Canal goes north of I-80 there are no paved roadways that cross it, although, there are dirt roads that go through the old Jordan River and its delta.

The River in this area goes through Salt Lake City and Salt Lake County.

The following information is not as inclusive as that for Maps A1-7. It highlights significant acreages that are managed, or could be managed, for wetlands and wildlife to the north and west of I-215, particularly as the current (or former) river enters (or entered) the Great Salt Lake.

SPECIFIC AREAS

Areas	Acreage	Status	Ownership
Areas By Current Jordan River			
Farmington Bay Waterfowl Management Area	17,000+ acres	Nature Park and/or Reserved	Utah Division of Wildlife Resources
Proposed Mitigation for the Proposed Legacy Parkway	1,500+ acres	Undecided	
Areas by Current and Former Jordan River			
Mitigation Commission	860 acres	Reserved and/or Nature Park	U.S. Government
South Shore Duck Clubs	16,700+ acres	Nature Parks and/or Reserved	Private
Areas By Former Jordan River			
Salt Lake Airport Mitigation	300 acres 1,200 acres	Reserved Undecided	Salt Lake City
Inland Sea Shorebird Reserve (mitigation for Kennecott Copper)	3,000+ acres	Reserved	Kennecott Copper
National Audubon Gillmor Sanctuary	1,400+ acres	Reserved	National Audubon Society

ADDITIONAL SUMMARY DETAILS ON THE AREAS LISTED ABOVE

Farmington Bay Waterfowl Management Area is a 17,000+ acre area that is managed by the Utah Division of Wildlife Resources. This area has significant waterbird habitat and use. Much of the area is off limits during the nesting season. Most of the area is open to hunting during the hunting season.

Proposed Mitigation for the Proposed Legacy Parkway is a 1,500+ acre area that borders a portion of the east side of the Jordan River beginning just north of Center Street in North Salt

Lake. Currently, this area is mostly privately owned. The mitigation proposal is included in the Final Environmental Impact State for Legacy Parkway, June 2000.

Utah Reclamation Mitigation and Conservation Commission has acquired 5 parcels of land totaling 860+ acres by the Farmington Bay Waterfowl Management Area and extending to Lee's Creek, which is north of I-80 and northeast of Saltair. These areas are reserved for wetlands and habitat, but also may have quite a bit of human use that is compatible with wildlife, depending on the specific parcel.

South Shore Duck Clubs In 1995, there were 13 Duck Clubs in the area that managed 16,700+ acres (National Audubon Society. 1995. South Shore Duck Club Study. Prepared for the Utah Reclamation Mitigation and Conservation Commission.) These areas are private property managed primarily for waterfowl for the benefit of the club members. Among the 13 duck clubs there is a great diversity of size and management.

Salt Lake International Airport Mitigation is a 300-acre area to the west of the Salt Lake Airport. This is a mitigation site for the third runway at the airport. The airport also owns an additional 1,200 acres that are adjacent to the mitigation site. These properties are supportive of the mitigation site, but the specific use for the property has not been permanently decided.

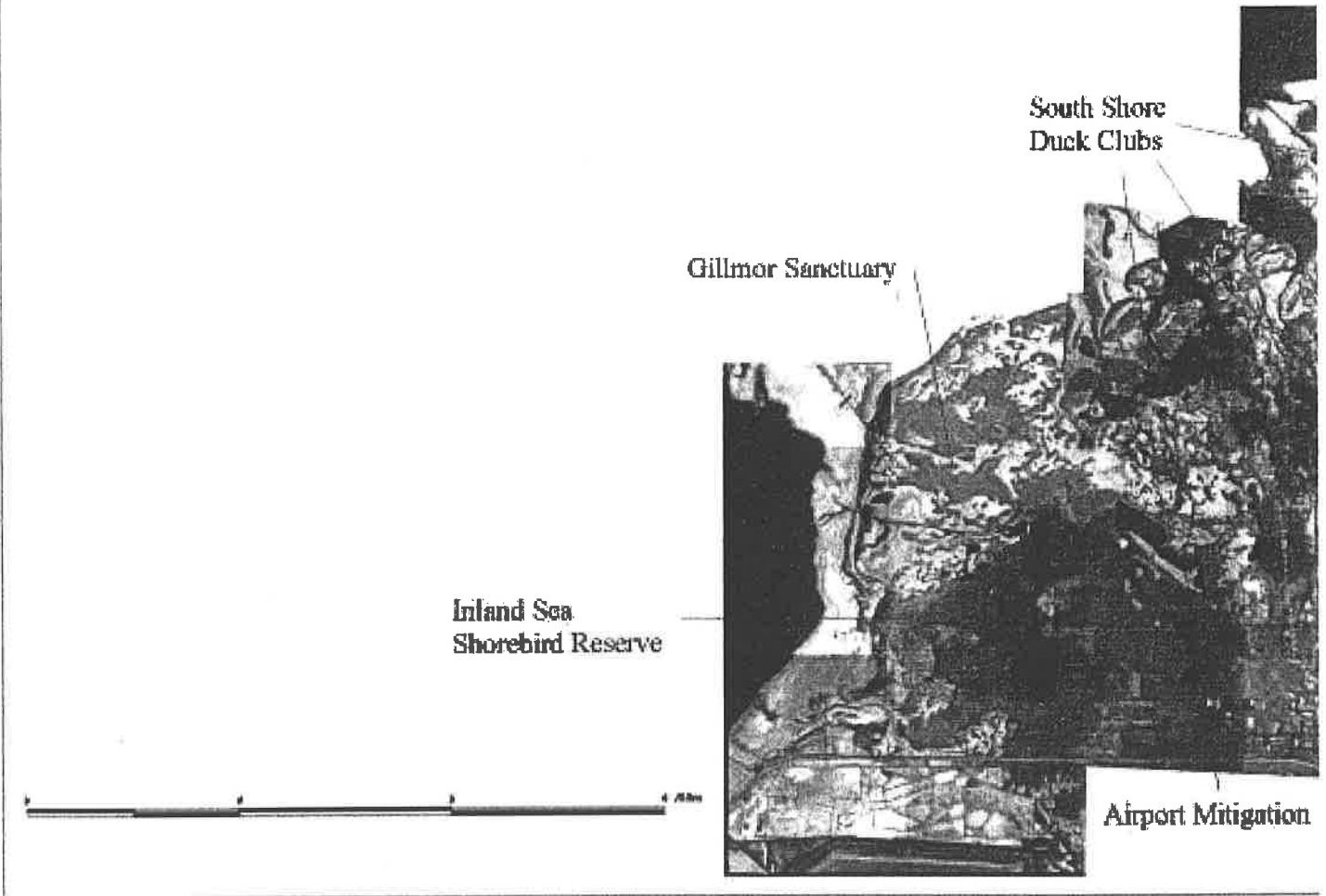
The Inland Sea Shorebird Reserve is a 3,000+ acre mitigation site owned by Kennecott Copper Corporation. The site is mitigation for the expansion of the Kennecott Copper Tailings Pond and also operates as a mitigation bank. The property is located north of I-80 and west of 7200 West.

The National Audubon Society Gillmor Sanctuary is a 1,400+ acre area to the north of the Inland Sea Shorebird Reserve and the Goggin Drain. The area is managed for wildlife.

Map A8

Jordan River Natural Conservation Corridor
North & West of I-215 by Great Salt Lake

Farmington E



APPENDIX B

Future Land Use Map Description

This map was compiled by Salt Lake County Planning Division (SLCo) based on land use maps provided by individual cities and communities within county boundaries. Since cities have different categories (light industrial, rural residential etc) and, often, different criteria for the same category (ie: low density residential in Sandy equals 6-12 dwelling unit/acre; in Bluffdale low density residential equals 2-3 du/ac) it was necessary for SLCo to reconfigure individual city 3-6 du/ac). See table below for SLCo category descriptions. Some categories included in city planning maps, have been combined in the SLCo map. Due to the large area incorporated in this map, small zoning pockets have been eliminated. Land use designation shown on this map has been approved by individual city/community councils. It was last updated on November 9, 1999.

Categories:

- AGRICULTURAL - Residential associated w/ agricultural uses. Density less than 1 du per 5 acres.
- AIRPORT - Airports, landing strips and associated uses.
- COMMERCIAL - Retail commercial, shopping centers, professional offices, etc.
- FOOTHILL/RES - Residential density up to 1 du per 2.5 acres
- FOREST/MULTI-FAM - Canyon resort development
- FOREST/REC - Residential in mountainous areas. Density can range from 2 du/ac to 1 du per 20 acres depending on site suitability and other constraints.
- FOREST/RES - Same as above
- FORESTRY - Same as above
- IND/HEAVY - Manufacturing, outdoor storage yards, refinery, etc.
- IND/LIGHT - Warehousing, research and development, manufacturing done within an enclosed building, etc.
- MANUF-EXTRACT - Mining, sand and gravel extraction, quarry, etc.
- MILITARY - Military base, armory, field range, etc.
- MIXED/DEVEL - Mix of commercial, office and residential uses.
- OFFICE - Professional office, office park, research and development etc.
- OPEN - Open space areas, nature preserve, wetlands, rangeland, etc.
- PARK - Developed park space, recreation centers, etc.
- PRISON - State Prison
- PUBLIC - Public and quasi-public institutions including: schools, churches, government facilities, etc.
- RES/HIGH DEN - Residential density greater than 15 du/ac
- RES/MED DEN - Residential density between 6 and 15 du/ac
- RES/LOW DEN - Residential density between 3 and 6 du/ac
- RES/RURAL DEN - Residential density below 3 du/ac
- TRANSPORTATION - Roads, streets, freeways, railroads etc.
- UTILITY - Public utilities, power corridors, etc.

APPENDIX C¹

Jordan River Natural Conservation Corridor Site Analysis Report (Hydrology & Ecology)

E. Lips and A. T. Harrison, Project Consultants
June, 2000

1.0 INTRODUCTION

The following report, in outline format, discusses the existing hydrological and ecological conditions and degree of land use impact for selected project areas along the Jordan River. An additional section discusses the potential for habitat restoration improvement. The areas are addressed proceeding from the south to the north, down the Jordan River corridor. Existing maps and reports dealing with the hydrology and ecology of the Jordan River wetlands have been reviewed by Lips and Harrison and all sites have been personally visited and inspected by us. Standard scientific and common names for plants are from *A Utah Flora*, S. L. Welsh et al. *Great Basin Naturalist* Memoir No.9 Brigham Young University 1987.

In addition, we have provided a synthesized, prioritization of the sites based on hydrological and ecological information as well as site potential for future successful, woody riparian habitat restoration.

1.1 Name and Approximate Location of Project Areas

Wetlands Park Utah Co. (approximately 25 acres natural)

Jordan River Narrows (South Salt Lake County line, north through Draper and Bluffdale)

Utah State Prison Property/River Bend/Colby (Bangerter crossing to approximately 12600 S., Draper, Salt Lake Co.)

South Jordan Riverway Enhancement Project (11400 S. to 10600 S., South Jordan, Salt Lake Co.)

Great Salt Lake Audubon/Tree Utah Riparian Restoration Project (10600 S. to 10200 S., South Jordan, Salt Lake Co.)

¹ The sites reviewed are either reserved, those recommended for reserved status (Chapter 3, Recommendation A1), or identified as having high potential for native vegetation, wetlands and wildlife. These sites are considered some of the best areas remaining, or in close proximity to areas with high potential, on the Jordan River.

West Jordan/Sharon Steel Jordan River Relocation and Restoration Project
(approximately 8800 S., West Jordan, Salt Lake Co.)

Little Dell Mitigation Project: (3900 S to 3300 S. West Salt Lake City, Salt Lake Co.)

SITE DESCRIPTIONS

2.1 Wetlands Park, Utah Co. (approximately 25 acres natural)

X. Existing Condition and Degree of Historic Land Use Impact

A. Hydrology

1. There is an existing, stable, high ground water table apparently controlled by proximity to Utah Lake.
2. This is a small, semi-natural area (25 acres) adjacent to more extensive wetlands to the east and north.
3. There are low riverbanks with the Jordan River near its original bed elevation. The river appears to be hydrologically stable without entrenchment.
4. There is a natural, broad flood plain but it is separated from the Jordan River on the east side by an artificially bermed and armored roadway on which the Jordan River Parkway Trail runs, creating cut-off oxbows with standing water.
5. There has been possible past channelization and dredging of the riverbed and re-alignment of the channel due to irrigation manipulations of the Utah Lake outlet point and operation of the Utah Lake pump station.

B. Ecology

1. There are unknown impacts on natural wetlands, up-gradient irrigation and drainage systems east and north of project area on natural wetlands. These historic irrigation/drainage/grazing systems have impacted the pre-settlement, natural wetland riparian values in a negative way. For example, the extensive riparian peachleaf willow (*Salix amygdaloides*) groves, seen at Willow Park on the bank of the Jordan River to the north, should be expected here but they are not present. The reasons for lack of woody species natural re-establishment here at Wetlands Park are not fully understood.
2. There are only a few existing sandbar willow thickets (*Salix exigua*) except at riverbanks. Similar to the lack of peachleaf willows discussed above, this is likely due to the lack of over-bank silt deposition and the additional presence of deep, standing floodwater during the flood years of 1983-85 that would not have allowed for willow or cottonwood seed placement and seedling establishment on muddy, bare banks. Pastures adjacent to the channel with a mixture of flood tolerant, wetland vegetation and introduced non-native pasture grasses prevent willow colonization during and after high water because bare mud flats are simply not available for willow seedling establishment. Also, continuous domestic livestock

grazing has had a detrimental effect on establishment and survival of woody riparian trees and shrubs during the recent post-flood years.

3. Good wetland and marsh vegetation (cattail, bulrush, sedge) exists in cut-off oxbows near the Jordan River.
4. Due to historic grazing disturbance there has been extensive invasion of the flood plain by exotic pasture grasses such as quack grass (*Elymus repens*), and red top (*Agrostis tenuis*). In addition, noxious weeds such as whitetop (*Cardaria draba*), and thistles (*Onopordum acanthoides*, *Cirsium arvense*, *C. vulgare*) have invaded the original native wetlands of wiregrass (*Juncus arcticus*), a threesquare species (*Scirpus americanus* and *S. pungens*), saltgrass (*Distichlis stricta*) and possibly scratchgrass (*Muhlenbergia asperifolia*).
5. There is a lack of riparian trees and shrubs such as peachleaf willow (*Salix amygdaloides*) and black hawthorn (*Crataegus douglasii*), etc. (See Jordan Narrows discussion for a listing of these original riparian shrub species).
6. A heavy invasion of exotic Russian olive (*Elaeagnus angustifolia*) and tamarisk (*Tamarix ramossissima*) exists in this area.

VI. Potential for Habitat Restoration Improvement

- A. An existing high water table could provide for successful, long-term survival of riparian tree and shrub habitat plantings. Irrigation water, to insure first year establishment, could possibly be provided by farm water shares from the adjacent property irrigation distribution system.
- B. It would be difficult to connect existing wetlands to the Jordan River unless the Jordan River Parkway Trail berm is breached at critical places to allow flood backflows from the river channel. Existing water drains under the parkway trail may be insufficient to allow connection from the river to the adjacent watertable east of the parkway trail.
- C. The existing, dense grassland/wetland pasture vegetation, as well as Russian olive and tamarisk, would make re-vegetation more costly based on Tree Utah's experience at the South Jordan sites.
- D. The proximity to high numbers of people on the Jordan River Parkway and the existing model airplane flight area may disturb nesting birds.
- E. The proximity to large, private, wetland areas to the east and north would increase the value of this 25-acre site if additional property acquisition were completed.

2.2 Jordan River Narrows

I. Existing Condition and Degree of Historic Land Use Impact

A. Hydrology

1. This is possibly the only reach of the Jordan River that retains a braided stream channel with islands, gently sloping stream banks, rapid flow and little entrenchment. These characteristics indicate that the river can easily adjust to

changes in water and sediment discharge, and it is therefore inherently more stable than incised reaches.

2. There is periodic overbank flow in high water years which maintains a good interconnection between the main channel and groundwater on both sides of river.
3. There are historic impacts due to nearby major canal irrigation diversions that have affected peak flood flows as well as scouring and re-deposition of sediment.
4. The nearby parallel canals on both sides of the river possibly increase off-channel water table due to seepage, depending on the transmissivity of the canal bed clay.

B. Ecology

1. This site has very high topographic and biotic diversity, more than any other place on the Jordan River corridor.
2. There is a large area of sandbar willow and mixed native wetland and riparian vegetation on both sides of river.
3. The extensive adjacent upland vegetation consists of large stands of native bunchgrasses such as bluebunch wheatgrass (*Elymus spicatum*) and Indian ricegrass (*Stipa oryzoides*) together with many native wildflowers mixed with big sagebrush (*Artemisia tridentata*) and rabbitbrush (*Chrysothamnus nauseosus* and *C. vicidiflorus*). Trees such as Gambel oak (*Quercus gambelii*), Utah juniper (*Juniperus osteosperma*), netleaf hackberry (*Celtis reticulata*), and box elder (*Acer negundo*) are found scattered in suitable microsites on the steep slopes. Native shrub species include chokecherry (*Prunus virginiana* var. *melanocarpa*), fragrant sumac (*Rhus aromatica* var. *trilobata*), golden currant (*Ribes aureum*), Wood's rose (*Rosa woodsii*), and black hawthorn (*Crataegus douglasii*), all of which have been used in plantings on other Jordan River restoration sites over the last few years.
4. The native vegetation has been rather heavily disturbed by canal and railroad construction on both sides of the river as well as a large existing gravel pit operation on the east side. Weeds occupy many of these intensely disturbed areas such as canal banks and railroad embankments. Railroad construction over the past 100 years has cut off some river meanders that still contain standing water and wetland vegetation.

II. Potential for Habitat Restoration Improvement

- A. The area has extremely high existing wildlife values.
- B. There is high bird diversity for both breeding and winter resident species based on the Jordan River New Year's Audubon Bird Counts and breeding bird survey.
- C. There is no need for habitat restoration efforts other than possible enhancement planting of tall riparian trees such as peachleaf willow and Fremont cottonwood.
- D. The site is remote from human disturbance and is naturally protected from future potential development by canal and railroad rights-of-way and steep topography. However future development of the Jordan River Parkway Trail could bisect the site.

This has until now been prevented by private canal companies objections to public trail access on their maintenance rights-of-way. Public access has been limited in the past by canal and water company control of roads. The existing gravel pit operation is having significant effects on the surrounding upland vegetation due to denudation and topsoil removal. Wetlands and the riparian zone could be impacted by erosion and disturbance.

E. The northward extent of this riparian zone needs to be better defined and studied.

2.3 State Prison/ S. L. Co. Parks & Recreation Riverbend/Colby (Bangerter Crossing of I-215 north to 12600 S.)

I. Existing Condition and Degree of Historic Land Use Impact

A. Hydrology

1. The riverbank is incised three to five feet below the existing floodplain on most of the property. This has probably lowered the area water table near the river slightly.
2. The 1983-84 floods moved the river channel west from the old Galena Canal diversion structure due to flood deposition and aggradation in this reach.
3. There are perched, spring-source wetlands above the river to the east.
4. There has been recent river reoccupation of old channels or oxbows. The river is not topographically constrained here in this long reach and therefore can more freely adjust its course on the fairly broad flood plain.
5. Corner Creek from Draper enters the floodplain on the east across the State Prison property, either crossing or entering the abandoned Galena Canal. This major stream keeps the floodplain water table higher than normal at a significant distance back from the river.

B. Ecology

1. The floodplain vegetation is a mixture of native and introduced pasture grasses with flood-planted Russian olive and tamarisk trees.
2. From the Bangerter Highway crossing North along the Jordan River Parkway Trail on the west side of the Jordan River, there is a small stream that creates a wetland area with native grasses, rushes and cattails just before entering the river. There is another spring-fed stream that enters the Jordan River from the west in this reach, through the S. L. County Riverbend golf course. This large, spring complex maintains a high water table on the west side of the river and maintains significant, native wetland and marsh vegetation. It needs further documentation and possible acquisition.
3. The wetlands property south of 12600 South and the adjacent S. L. County Parks property on the east side of the river together comprise one of the largest natural wetland complexes in this area of the county. The existing high water table is fed by underground springs and seeps and was at one time supplemented by irrigation from the Galena Canal. On the floodplain there are extensive stands of wiregrass

(*Juncus arcticus*), three-square (*Scirpus americanus* & *S. pungens*), sedges (*Carex aquatilis* or *C. nebrascensis*), saltgrass (*Distichlis spicata*) and scratchgrass (*Muhlenbergia asperifolia*), together with scattered cattails and bulrushes in the deep water areas. In addition, several infrequent native wildflowers are found here including the water groundsel (*Senecio hydrophyllus*) and the meadow goldenweed (*Haplopappus lanceolatus*), both of which indicate high quality, permanent wetlands. The whole area has been extensively but not heavily grazed for over 100 years. Nevertheless, the area comprises one of the best examples of native wetlands along the Jordan River. The greatest value of the natural, spring-fed wetlands (and adjoining property to the south) is primarily their existing condition. They possibly represent pre-settlement vegetation along the Jordan River floodplain better than any other site but this would require additional, quantitative and qualitative ecological documentation.

II. Potential for Habitat Restoration Improvement

- A. Due to existing public ownership, and potential for public ownership, on both sides of the river there is great potential for habitat restoration.
- B. Extensive upland and lowland areas on the State Prison and S. L. County properties could be used for woody tree and shrub habitat plantings. With the proximity of old abandoned meanders and high groundwater tables due to springs on the east and west, together with Corner Creek entering the property from the east and the unnamed stream entering near the Bangerter crossing from the west, this area could become an important habitat restoration area for neo-tropical migrant birds. It would require a detailed restoration and management plan dealing with stream course diversion and irrigation similar to the South Jordan/Audubon project at 10600 S. Some mitigation/restoration work was done approximately ten years ago on the Salt Lake County property with poled cottonwood and willow cutting plantings, but many of the trees have been beaver damaged and future tree plantings would necessitate protection by net wire wrapping of any newly planted trees.
- C. The existing Jordan River Parkway Trail located along the Galena Canal bank moves people to the east of the wetland complex away from the immediate river bank and the lower areas where habitat plantings would be located and where birds would be expected to nest.
- D. Interagency memoranda of understanding or conservation easements would need to be created to safeguard long-term habitat restoration work.

2.4 South Jordan Riverway Enhancement Project (11400 S. north to 10600S)

I. Existing Condition and Degree of Historic Land Use Impact

A. Hydrology

1. Willow Creek, a major agricultural/urban drainage use stream enters the property from the east onto the floodplain and has created an extensive wetland complex augmented by existing spring sources which continue to approximately 10600 S. Unfortunately, Willow Creek has been channelized and relocated to property lines, and adjacent wetlands have been drained by mosquito control work. Historic irrigation of lowland pastures and fields was from the Galena Canal and Willow Creek.
2. The ground water table near the Jordan River has been lowered three to five feet, due to at least two past river channelization and flood control projects. The water table is significantly closer to or at the surface along this two-mile stretch due to seeps and springs from the east side of the river bluffs.
3. The Jordan River bed will aggrade on both sides of 10600 South as evidenced by massive gravel removal by Salt Lake County Flood Control after the 1983-84 flood. This tendency to raise its bed will eventually enhance the ground water level adjacent to the river. Permeable sands and gravels deposited by the aggrading river are characteristic of this area of the floodplain.
4. There are significant, up-gradient spring water sources above old, abandoned meander channels throughout the area.

B. Ecology

1. This region on the east side of the Jordan River is a mile long strip of natural wetlands that has been in continuous pasturage of domestic animals for over one hundred years.
2. Much of the ecological value of this site is the existing wetland marsh vegetation that has been documented in baseline studies by IHI in an inventory and proposed management plan for the site. Similar to the Colby site south of 12600 S., there are extensive stands of wiregrass, three-square, scratchgrass and other species characteristic of wetlands with a high ground water table. The riparian woody tree and shrub species which might have occupied the banks of Willow Creek and the Jordan River prior to settlement and intensive domestic grazing are known fairly certainly based on relict area vegetation on Dry Creek only one mile away, and from other areas along the Jordan River corridor (Harrison, unpublished data). The Dry Creek relict area called Neff's Grove contains peachleaf willow, box elder, black hawthorn, fragrant sumac, golden currant, Wood's rose, and sandbar willow, all of which are currently being used as restoration species in various places along the Jordan River. In addition, herbaceous riparian species such as scouring rush (*Equisetum laevigatum*), False Solomon's Seal (*Smilacina stellata*) and Canada wild rye (*Elymus canadensis*) have been documented at the Neff's Grove site on Dry Creek and could possibly be used in future herbaceous habitat plantings.
3. The earliest homestead settlement of this area of Salt Lake County began with Milo Andrus and others who settled in the Crescent area (then called Dry Creek) due to

wild hay and winter pasturage offered by the high water table, sub-irrigated Jordan River floodplain.

II. Potential for Habitat Restoration Improvement

- A. Habitat restoration plans have been developed for this area by IHI, a local environmental consulting company, and restoration management and planting projects have been conducted by Tree Utah and IHI over the past several years.
- B. There is the potential to reconnect dredge-cutoff oxbows, with existing standing water, to the mainstream river channel or to replenish the oxbows with water from either Willow Creek or from the existing springs. Extensive hydrological restoration of the pre-settlement water table and reactivation of cut-off meanders in this reach of the river are feasible due to the aggrading riverbed, but only if future re-channelization or dredging is avoided.
- C. There is the potential for extensive riparian tree/shrub habitat restoration planting along Willow Creek, some of which is currently completed or underway.
- D. River bank stabilization and restoration is currently being done on both sides of the river and will allow good riparian woody tree and shrub revegetation. South Jordan City ownership on both sides of the river should allow lateral migration of the river to the west if appropriate set back requirements are met for the Jordan River Parkway Trail.

2.5 Great Salt Lake Audubon/Tree Utah Riparian Restoration Project (10600 S. to 9800 S.)

I. Existing Condition and Degree of Historic Land Use Impact

A. Hydrology

- 1. The Jordan River has been channelized and bermed by dredge spoil on the west side of the river where the Jordan River Parkway Trail is currently located (along the immediate west bank). However, the right-of-way is rather wide and the trail could possibly be set back to allow future lateral migration of the channel. The water table of the flood plain west of the bank berm is high as shown by standing water and springs on the Palmer property.
- 2. On both sides of the river as many as 10-12 cut-off meanders exist due to past years of river straightening and channelization. Water stands in most of these cut-off meanders and they are vegetated by cattail and bulrush species.
- 3. There is a generally high ground water table from 0-5 feet due to numerous existing springs and seeps. Approximately eight springs have been documented on the Greenwood property alone (Lips unpublished map).
- 4. There has been fairly extensive hydrological documentation and modeling conducted for this site by Great Basin Earth Science to help guide habitat restoration decisions.

B. Ecology

1. There was significant overflow of the whole area during the flood years of 1983 and 1984 when the river re-occupied its eastern meanders and oxbows. The existing exotic tamarisk (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*) trees were established from seed distributed by this bank-to-bank overflow during those high water years. Many other introduced noxious weeds such as the wild carrot or Queen Ann's Lace (*Daucus carota*), Teasel (*Dipsacus sylvestris*), poison hemlock (*Conium maculatum*), Scotch thistle (*Onopardum acanthium*), whitetop (*Cardaria draba*), and broad-leaf cress (*Lepidium latifolium*) were introduced to these floodplain pastures from upstream seed sources, never having been here before. These weeds have persisted during secondary succession for over 15 years on the disturbed floodplain even without grazing disturbance and will require human intervention to control them.
2. The native wetland vegetation in this area is essentially the same as on the South Jordan Riverway Enhancement site, with extensive meadows of wiregrass, three-square, bullrush, saltgrass and scratchgrass, with cattail and bullrush in the deeper standing water. Most pre-settlement woody riparian species, except for the sandbar willow, have been destroyed by river channelization and domestic animal grazing. However, there is one record of an old peachleaf willow tree on a cut-off meander.
3. There was significant native vegetation reestablishment on the historic Harrison farm property along the muddy, wet banks of the high water lines during the flood years of 1983 and 1984. This is part of the natural riparian tree recruitment process after significant flood events. Fremont cottonwood trees (*Populus fremontii*), peachleaf willow trees (*Salix amygdaloides*) fragile willow trees (*Salix fragilis*) and sandbar willow shrubs (*Salix exigua*) all germinated and established themselves on former pasture land in this area. Many of the cottonwood and willow trees have been subsequently destroyed by beaver populations along this reach of the Jordan River. In addition to the native woody plant establishment allowed by the floods, there was significant new establishment of reed canary grass (*Phalaris arundinacea*), a native floodplain grass that provides significant bank erosion protection.

II. Potential for Habitat Restoration Improvement

- A. There is a very high possibility of reconnecting historic river meanders to the existing, straightened, Jordan River channel due to the aggrading riverbed in this reach.
- B. There is a very high potential for a wide riparian zone restoration between the old abandoned meanders and the current riverbank due to a high existing water table. Much of this work is already underway by Tree Utah and Great Salt Lake Audubon.
- C. There is a high potential for supplemental flowing water augmentation from both Willow Creek (as it travels from the South Jordan property beneath 10600 S.) and

from existing water shares in the East Jordan Canal Company that can be diverted toward these wetlands at approximately 10200 S.

- D. There is still the potential for reconstructing a direct, off-channel flowing stream for one mile across these properties from 10600 S. to 9800 S. with riparian habitat restoration on both sides of this constructed waterway. See specific IHI and Great Basin Earth Science plans and reports for contour maps, features, etc. If these plans are followed through, with future property acquisition and off-channel stream restoration, this area could be one of the largest and most valuable of all the Jordan River corridor habitat restoration projects.

2.6 West Jordan/Sharon Steel Jordan River Relocation and Restoration Project (approximately 8800 S., West Jordan, Salt Lake Co.)

I. Existing Condition and Degree of Historic Land Use Impact

A. Hydrology

1. This area west of the Jordan River consists of a flat, flood plain area with natural topography, but with a steep, degrading, channelized riverbank across from the Sharon Steel tailings cap and remediated wetlands.
2. The water table under the area is unknown but appears to be possibly from six to eight feet, depending on the distance from the river.
3. There are few natural springs and little or no seepage.
4. There is an existing water source drawn from the North Jordan canal that provides a small stream of water to an adjacent mitigation project.

B. Ecology

1. There are no meanders, cut-off oxbows and essentially no existing wetlands with native vegetation on the property.
2. Adjacent to the river is an abandoned, cultivated field in weedy succession. West of this field is an unplowed, overgrazed pasture with a few stands of wiregrass and saltgrass.
3. The area has little ecological value in its current state.

IV. Potential for Habitat Restoration Improvement

- A. For any sizeable, sustainable, habitat restoration to be successful, the river bed and the water table would have to be significantly elevated to ensure root penetration of woody species. Currently, the site is too dry to successfully establish woody species without regular irrigation from the North Jordan canal. The current plan to reconstruct the whole Jordan River meander system through this area would need to insure proper grading and stream bed elevation and supplemental irrigation to allow successful habitat restoration away from the immediate riverbank.

2.7 Little Dell Mitigation Project: (3900 S to 3300 S. West Salt Lake City, Salt Lake Co.)

I. Existing Condition and Degree of Historic Land Use Impact

A. Hydrology

1. Flooding overflow of the whole area on both sides of the river in 1983-84, and the proximity of old, cut-off oxbow meanders due to river channelization, indicate a shallow water table with important connection between the floodplain and the river. The new cottonwood forest established immediately after these flood years indicates that this is an active floodplain with regular overflow events.
2. Banks are low, vegetated and stable.
3. There are two, large, cut-off meanders on the west side of the river, and a major, recently reforested oxbow on the east near 3900 S.
4. Hydrologically, this appears to be a fairly stable reach.

B. Ecology

1. Approximately half of this 50-acre site appears to be forested with naturally established cottonwood trees. The other half has been a partially successful mitigation planting of upland trees and shrubs (Rocky Mt. juniper, chokecherry, Wood's rose, golden currant, fragrant sumac, sagebrush, etc).
2. The existing riparian trees on the floodplain and oxbows are mostly 15 years old, but there are a few larger, older trees on meander banks which probably served as a seed source for post-flood establishment.
3. There is a notable absence of native, understory shrub species (other than those planted as part of the mitigation project) in the recently established cottonwood forest. This is probably due to the lack of a natural seed source, this area of the county being intensely urbanized and industrialized.
4. There is a notable absence of nesting birds, possibly due to the lack of a diverse shrub understory layer (Russ Norvell, personal communication).
5. There is heavy infestation of introduced tamarisk and Russian olive trees on both sides of the river. The seeds of these species were dispersed, planted and established by the floods fifteen years ago, along with the native cottonwood and willow trees. They will require removal since native shrub species cannot establish under the dense shade or root competition of both or either of these exotic, noxious weed trees.

II. Potential for Habitat Restoration Improvement

- A. The site has been naturally restored with riparian tree species from the recent floods. This natural restoration could be enhanced by additional planting of native, adapted woody shrubs as is currently being done on the South Jordan section and at other sites along the Jordan River corridor.

- B. The partially successful plantings on the upland mitigation area could be enhanced by additional, native, drought tolerant shrubs and grasses in the dry, upper areas along the existing Jordan River Parkway trail. In a similar way, additional riparian shrubs could be added to the floodplain mitigation plantings.
- C. There is significant opportunity to restore and augment areas on the west side of the river.
- D. There is apparently no need for hydrologic enhancement for restoration success.
- E. There is fairly intensive beaver activity in the area that is thinning out the closely spaced cottonwood trees. Nevertheless the older, larger trees need to be protected by wire wrapping.
- F. There is currently public access abuse and disturbance by children with bikes (a BMX obstacle course has been illegally constructed) to a small portion of the east side mitigation area that can be solved by proper exclusionary fencing along the nearby Jordan River Parkway Trail.

3.0 SITE RANKING

The following list is a priority ranking, based on both the existing site hydrological and ecological characteristics and values, as well as the potential for restoration of pre-settlement, woody, riparian habitat. The sites are ranked numerically from the best to the least suitable. A short justification for the numerical ranking summarizes the major reasons for the decisions.

1. Jordan River Narrows

- A. The existing hydrology is the least impacted by human use and domestic livestock grazing except for the irrigation canal diversion flows during the spring and summer. The low banks and braided meanders with naturally vegetated islands indicate that the river and floodplain are likely to adjust naturally. This ultimately provides for a stable river floodplain system and maintains high groundwater adjacent to the channel.
- B. The topographic and biotic diversity is much higher than any other Jordan River corridor wetlands or riparian forest. There are extensive stands of sandbar willow habitat throughout the area that are adjacent to diverse, native, upland vegetation. There are a number of native shrub species in the area which provide important habitat for birds as well as large adjacent areas of steep slopes stabilized by native grasses.
- C. It is unlikely that there will be future urban development impacts on bird habitat due to the area's isolation and steep, surrounding topography.
- D. Habitat restoration costs would be minimal due to the area's intact, functional hydrology and established riparian vegetation (willows etc.).

- 2. **South Jordan Riverway Enhancement Project (11400 S. north to 10600S) coupled with Great Salt Lake Audubon/Tree Utah Riparian Restoration Project (10600 S. to 9800 S.).** Because these sites are immediately adjacent to each other on the east side of the Jordan River floodplain they should be considered as one habitat restoration project.



- A. These sites have probably received more extensive hydrological and ecological baseline documentation and detailed planning than any other reach on the Jordan River Corridor. In addition, this is the third consecutive year in which both exotic tree removal and restoration planting of thousands of native trees and shrubs have been conducted. Because of these recent restoration efforts and the total size of potential, aggregated adjacent parcels, this project site should receive a continuing commitment to additional acquisition and restoration efforts.
 - B. Both sites have a water table near the surface fed by natural spring sources, a feature important for successful riparian restoration. In this regard these sites rank higher than the State Prison/Salt Lake County Parks/Colby properties ranked next.
 - C. Willow Creek will provide an important water source for hydrology restoration, and woody vegetation re-establishment.
- 3. State Prison/ S. L. Co. Parks & Recreation Riverbend/Colby (Bangerter Crossing of I-215 north to approximately 12600 S.)**
- A. This reach of the Jordan River floodplain has an intact, functional hydrological system.
 - B. The floodplain is long and broad in size.
 - C. Due to existing springs, marshes and streams, over half of the property is high quality wetlands, with a shallow water table that would allow for successful riparian habitat restoration.
- 4. Little Dell Mitigation Project: (3900 S to 3300 S. West Salt Lake City, Salt Lake Co.)**
- A. The area is fairly small with only approximately 25 acres of a total of 50 acres of high quality wetlands and established riparian floodplain forest.
 - B. The riparian forest habitat is discontinuous and surrounded by urban development, trails, etc.
 - C. The area has a stable hydrology with demonstrated natural restoration success that dates from the 1983-84 flood period.
- 5. Wetlands Park, Utah Co. (approximately 25 acres natural)**
- A. Due to its small size and lack of contiguity to adjacent, protected property, the value for sizeable habitat restoration may be limited.
 - B. The hydrology is stable and water table may be suitable for restoration establishment of woody plant species.

6. West Jordan/Sharon Steel Jordan River Relocation and Restoration Project
(approximately 8800 S., West Jordan, Salt Lake Co.)

- A. There are few existing hydrological or ecological values on the property.
- B. There will be total reliance on supplemental canal irrigation to establish woody riparian species on upper areas of the floodplain since this area is not naturally spring fed.
- C. Unless extensive re-elevation of the riverbed is designed there will be a limited area for woody riparian restoration other than along a narrow bank zone of the reconstructed river channel.

APPENDIX D

GOAL III PRESERVE CRITICAL LANDS INCLUDING AGRICULTURAL, SENSITIVE, AND STRATEGIC OPEN LANDS

C 1	<p>Promote walkable development that encourages permanently reserved open lands through incentives.</p>	<ul style="list-style-type: none"> • Slows land consumption, eases pressure on existing open lands • Provides more affordable housing options with more amenities • Provides open areas within communities that can be used for agriculture or outdoor recreation 	<p>local governments, developers, Envision Utah</p>	<ul style="list-style-type: none"> • Encourage local governments to provide incentives—such as density bonuses—for open space • Actively provide information to local governments and developers on the benefits of communities that incorporate open space
C 2	<p>Promote tax incentives for reuse of currently developed areas.</p>	<ul style="list-style-type: none"> • Encourages efficient use of existing infrastructure • Helps preserve new undeveloped land • Encourages location of new development near existing services, thereby reducing traffic and travel times 	<p>Quality Growth Commission, Envision Utah, local governments</p>	<ul style="list-style-type: none"> • Work with Quality Growth Commission to identify Quality Growth Areas, and propose incentives for development in those areas. • Help cities and towns understand options for encouraging reuse of developed areas
C 3	<p>Support the establishment of transfer of development rights programs to promote protection of open space and maintain quality of life.</p>	<ul style="list-style-type: none"> • Allows owners of sensitive lands to transfer their development rights to less sensitive areas. • Helps to preserve sensitive lands while preserving private property rights 	<p>local governments, The Nature Conservancy, Utah Open Lands</p>	<ul style="list-style-type: none"> • Identify communities or areas where development rights could be traded • Establish a mechanism for assigning rights and trading them (various options)
C 4	<p>Support the protection of sensitive lands.</p> 	<ul style="list-style-type: none"> • Protects views and vistas for the larger community • Protects wetlands, watersheds, and wildlife habitat • Helps to protect lands that are particularly sensitive to the impacts of development • Development on steep slopes often causes erosion and instability, and ruins the aesthetic quality of hillsides and ridgelines • Development on steep slopes and sensitive lands often damages critical wildlife habitat and blocks access to recreation areas 	<p>cities, counties, developers, The Nature Conservancy, Utah Open Lands, Quality Growth Commission, state government</p>	<ul style="list-style-type: none"> • Work with local governments to revise zoning codes and develop overlay zones • Inform builders about the damage caused by development on steep slopes and sensitive lands • Work with land trusts to purchase particularly sensitive areas to protect them from development
C 5	<p>Promote use of conservation easements to preserve key/critical land for parks and recreation, open space, wildlife habitat, and agriculture, providing public access where appropriate, and organizing these areas into a regional network to the extent possible.</p> 	<ul style="list-style-type: none"> • Preserves key/critical land for parks and recreation, open space, watersheds, wildlife habitat, and agriculture 	<p>cities, counties, developers, The Nature Conservancy, Utah Open Lands, American Farmland Trust</p>	<ul style="list-style-type: none"> • Envision Utah work at the local and regional levels to develop plan for a regional network of trails and open spaces • The Nature Conservancy, Utah Open Lands, American Farmland Trust, inform land owners about conservation easements, identify obstacles • Local governments, developers, and Envision Utah work to create and adopt "rural residential cluster" zones to preserve rural or natural areas that have value as agricultural land, natural areas, or community separators.
C 6	<p>Encourage the dialogue and ongoing public discussion of how to identify significant public and/or private funds for critical lands preservation. Push to resolve the appropriate balance of public and private funds to be used.</p>	<ul style="list-style-type: none"> • Land owners may have a reasonable expectation of economic return on a sensitive piece of land, so acquisition of the land may be the only way to preserve it from development while preserving property owners' rights. • Major constraint to open space preservation is funding to acquire land or easements. Some lands must be purchased to preserve private property rights. There are successful programs that rely on private funds for land acquisition, while other programs have significant public funding sources (e.g., lottery in Colorado) 	<p>The Nature Conservancy, Utah Open Lands, American Farmland Trust, Quality Growth Commission, local governments</p>	<ul style="list-style-type: none"> • Encourage public and private open space acquisition programs to protect designated sensitive and natural areas on a "willing seller" basis. • Encourage private land trusts to channel available private funds into critical lands preservation • County and community option sales tax program for critical lands • State funding • Tax incentives • Pool available funds and make available to local governments for critical lands acquisition
C 7	<p>Pursue public land trades to create more private developable land, preserve critical lands and watersheds, and protect sensitive lands from development.</p>	<ul style="list-style-type: none"> • Greater Wasatch Area's (GWA) land base is limited in part by large federal land holdings surrounding the urban area. Amount of usable land could be increased by trading sensitive private lands into federal hands, in exchange for federal lands that are more appropriate for development. 	<p>USDA Forest Service, US BLM/Department of Interior, Envision Utah, The Nature Conservancy, State of Utah, Utah State and Institutional Trust Lands Administration</p>	<ul style="list-style-type: none"> • Work with cities, counties, and developers to identify sensitive lands currently in private hands • Work with Forest Service, the BLM, and SITLA to identify federal lands appropriate for development, and broker exchanges • Governor's Office work with regional councils and county councils of government

Source: Envision Utah, 2000

APPENDIX E RECOMMENDED NATIVE PLANTS

JORDAN RIVER RESTORATION PROGRAM: RIPARIAN OVERSTORY SPECIES SUITABILITY

	Hawthorne	Boxelder	Hackberry	Fremont	Ammannia	Amur	Chokecherry	Willow	Waterbirch
Height at Maturity	15'	60'	15'	100'	100'	100'	20'	80'	25'
Growth Rate	2-Med	3-Rapid	1-Slow	3-Rapid	3-Rapid	2-Med	2-Med	3-Rap	1-Slow
Lifespan (Years)	30	90	100	100	70	70	30	100	25
Proximity to Waterable (Saturation Tolerance)	3/3'	2/10'	1/30'	3/5'	3/5'	3/5'	2/10'	3/3'	3/3'
Shoreline Anchoring	3/High	2/Med	1/Low	3/High	3/High	3/High	3/High	3/High	3/High
Alkalinity Tolerance	2/Med	2/Med	1/Low	2/Med	1/Low	1/Low	1/Low	2/Med	1/Low
Nutrient Cycling/Uptake				3/High	3/High	3/High		3/High	
Food Chain Support (Seed Source)	3/High	2/Med	2/Med	1/Low	1/Low	1/Low	3/High	1/Low	1/Low
Habitat Support	2/Med	3/High	3/High	3/High	3/High	3/High	2/Med	3/High	3/High
Food Chain Support (Insect Source)	3/High	3/High	2/Med	2/Med	3/High	2/Med	3/High	3/High	2/Med
Natural Sustainability	3/High	3/High	1/Low	1/Low	2/Med	2/Med	3/High	1/Low	2/Med
Flow Tolerance	3/High	2/Med	1/Low	2/Med	3/High	3/High	2/Med	3/High	3/High
Flood Debris Potential	1/Low	3/High	1/Low	2/Med	3/High	3/High	1/Low	2/Med	1/Low
Parkway Acceptability	2/Med	1/Low	2/Med	2/Med	1/Low	1/Low	2/Med	2/Med	3/High
Soil Type	2/Med	2/Med	1/Coarsc	3/Fine	3/Fine	2/Med	2/Med	3/Fine	2/Med
TOTALS	74	178	132	230	202	199	76	212	75

Prepared from Technical Symposium
Sponsored by the Jordan River Watershed Council
Autumn, 1997

APPENDIX F

PUBLIC INVOLVEMENT IN THE REVIEW AND DEVELOPMENT OF THE DRAFT REPORT

The following entities or individuals were involved in the review and development of the Draft Report.

Jordan River Sub-Basin Watershed Council was involved in the following ways:

In January 1999, the Council passed a motion that it would act as a Steering Committee for the Jordan River Natural Conservation Corridor Report. In February 1999, the Council passed a motion to support a grant that was submitted to the River Network for the development of the Jordan River Natural Conservation Corridor Plan. This grant was not funded. Later in 1999, the Council was informed that an agreement for preparing this report would proceed with funding from the Mitigation Commission and U.S. Fish and Wildlife Service.

Throughout 1999 the Council addressed issues relating to the development of the Jordan River Conservation Corridor such as trail construction within the corridor in March, the proposal to increase planning coordination along the river in October and management of public lands in November.

In January 2000, the Council was asked to review and comment on draft maps and narratives included in Appendix A.

Although the Council is going through a reorganization and no longer formally meeting, members of the former Watershed Council were asked to review the Draft Report on July 10, 2000.

Jeff Salt, Jordan River Environmental Education Director for Great Salt Lake Audubon has displayed draft maps and additional information about the Jordan River and/or given presentations regarding the Jordan River and the corridor concept to many groups and organizations since January 2000. The displays and/or presentations have included the general meeting of Great Salt Lake Audubon; Friend of the Great Salt Lake Issues Forum; Bluffdale City Council and Planning; Earth Day at Gardner Village, Midvale, Utah; South Jordan City Council Meeting; the Provo/Jordan River Parkway Foundation Board Meeting; Salt Lake City, Jordan River Advisory Committee; Governor Leavitt, at Natural Resource Week Ceremony; Riverton City, Wetlands Project Team.

The Salt Lake County Council of Governments will be asked to review the Draft Report at their July 6, 2000 meeting.

Resource Development Coordinating Committee (RDCC) this group of state and federal interests learned about the Draft Report through a presentation on July 11, 2000.

The Political Subdivisions Interim Committee of the Utah State Legislature heard an update on the development of the Jordan River Corridor on July 12, 2000. The Draft Report was briefly presented to the legislators on the Committee.

The Mitigation Commission heard a presentation regarding the Draft Report during their August 3, 2000 public meeting.

Review Results The Draft Report was provided to over 100 people and presented at the public meetings listed above. Overall, the Draft Report was well received. Technical comments were addressed and the text changed for the Final Report where appropriate.

The Desert News published a feature article on the Jordan River Natural Conservation Corridor on Sunday, July 16, 2000.

Note: In order to increase knowledge and public involvement, a brochure entitled "The Jordan River Natural Conservation Corridor" was developed. This brochure was handed out at the public meetings listed above. It is also available at the Mitigation Commission from Joan Degiorgio (801-524-3146), the U.S. Fish and Wildlife Service Office from Elise Peterson (801-524-5001, extension 123), from National Audubon Society from Wayne Martinson at (801-355-8110), or Great Salt Lake Audubon Society from Jeff Salt at (801-485-2550).

APPENDIX G

TECHNICAL DEVELOPMENT

Numerous local experts provided valuable assistance in the development of the Report. The following provides highlights of this technical development.

■ On October 29, 1999, experts on subjects covered in this report were invited to a half-day meeting. The experts were asked to provide resource information as well as details regarding the categories of Pre-European Settlement, Historic, Current Condition and Realistic Desired Future Condition. At this meeting a preliminary library search of pertinent materials was provided.

■ On November 3, 1999, various experts were invited to tour the Jordan River and then provide any additional thoughts or information to what was discussed on October 29. The sites visited on this day included: Inlet, Wetlands, Willow, and Wildlife Parks in Utah County; the Jordan Narrows; the Prison property by Bangerter Highway; the Colby property at 12300 South; and, the Sharon Steel Restoration sites at 10600 South and West Jordan.

■ Elliot Lips, P.G., Great Basin Earth Science, Inc, and Ty Harrison, Ph.D, Botany Professor at Westminster College were asked to provide additional information on hydrology and vegetation. Their report on specific sites is presented in Appendix C. Lips and Harrison also provided material for the hydrology, stream channel, floodplain structure, terrestrial wildlife, and vegetation sections of the Report.

■ Russ Norvell, Nongame Avian Ecologist, Utah Division of Wildlife Resources was a major contributor for the Avian Section. Kevin Jones, State Archaeologist, Utah Division of State History, was a major contributor for the Social Domain, Pre-European Settlement Section.

■ The following individuals commented specifically on various components of the report: Dave Wham, Environmental Scientist, Utah Division of Water Quality for the Water Quality Section; Doug Sakaguchi, Central Region Habitat Manager, Utah Division of Wildlife Resources for the Terrestrial and Fisheries Section; and, Maureen Wilson, Project Coordinator, Mitigation Commission for the Fisheries Section.

■ Steve Jensen, Program Manager, Water Resources Planning and Restoration, Salt Lake County Public Works, extensively reviewed a draft report in early June. John Rice, Project Coordinator, and Diane Simmons, Public Information Officer, Mitigation Commission, also thoroughly reviewed this draft.

■ The continuing development and review of the Report was conducted by Jeff Salt, Jordan River Environmental Education Director, Great Salt Lake Audubon Society; Wayne Martinson, Utah Wetlands Coordinator, National Audubon Society; Elise Peterson, Biologist, U.S. Fish and Wildlife Service and Joan Degiorgio, Planning Manager, Mitigation Commission.

■ Many other individuals willingly contributed their expertise to various components of the report. This was particularly true for the information contained in Appendix A, where numerous people representing county and municipal governments, as well as state and federal agencies, provided detailed information on various parcels of land throughout the Jordan River corridor.

■ Jill Eichbauer, Salt Lake County Public Works Department, Engineering Division, produced Appendix A draft maps and Richard Mingo, Planning Coordinator, Mitigation Commission, provided the final map versions in Appendix A.

APPENDIX H

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