

Sharon Steel Natural Resource Restoration Plan

By:
Elise Peterson

December 30, 1997

U.S. Fish and Wildlife Service
Lincoln Plaza, Suite 404
145 East 1300 South
Salt Lake City, Utah 84115

Sharon Steel Natural Resource Restoration Plan

Proposed Action: Restoration of migratory bird populations and their supporting habitats injured as a result of the release of hazardous materials from the Sharon Steel Superfund Site.

Proposed By: U.S. Fish and Wildlife Service
Ecological Services
Utah Field Office
Lincoln Plaza Suite 404
145 East 1300 South
Salt Lake City, Utah 84115
(801) 524-5001

Legal Mandates: Comprehensive Environment Response, Compensation and Liability Act (1980) as amended 42 U.S.C. § 9607 (F)(1) and 9622(j)(2)

Natural Resource Damage Assessment, 43 Code of Federal Regulation Part 11

Federal Water Pollution Control Act 33 U.S.C.A. § 1321(f)(5)

Action Locations: Selected sites along the Jordan River in Salt Lake County, Utah.

Author: Elise Peterson
Fish and Wildlife Biologist

ACKNOWLEDGMENTS

The *SHARON STEEL DAMAGE SETTLEMENT: A Conceptual Restoration Plan* was used to solicit project proposals for restoration which are included in this document. The U.S. Fish and Wildlife Service (Service), Utah State Field Office wishes to acknowledge the Technical Committee for their assistance in reviewing and ranking the proposals. We would also like to acknowledge Great Salt Lake Audubon, TreeUtah, South Jordan City and the City of West Jordan for their assistance in the completion of the Sharon Steel Restoration Plan.

The Sharon Steel Technical Committee is comprised of the following Salt Lake City, Utah, members:

Elise Peterson, U.S. Fish and Wildlife Service
Evan Sullivan, Utah Division of Environmental Response and Remediation
Cecile LeBlanc, Utah Division of Wildlife Resources
Laura Lockhart, Utah Attorney General's Office
Steve Jensen, Salt Lake County Commissioner's Office
Mike Schwinn, U.S. Army Corps of Engineers
Earl Jackson, Utah State University Cooperative Extension Service

A Trustee Committee comprised of the appointed trustees for both Federal trust resources and State trust resources provided oversight and direction to restoration planning. The Trustee Committee includes:

Reed Harris, U.S. Fish and Wildlife Service, Salt Lake Field Office, Supervisor
Kent Gray, Utah Division of Environmental Response and Remediation, Salt Lake City, Utah,
Director

EXECUTIVE SUMMARY

Sharon Steel and Midvale Slag are two Superfund sites located on the Jordan River in Midvale, Utah. The two sites are heavily contaminated by mining and smelting wastes. In 1991, a \$2.3 million damage settlement was awarded to the U.S. Department of the Interior (DOI) in compensation for injuries to Federally-protected trust resources caused by contamination of the Jordan River Corridor from these Superfund sites. Federal law, which safeguards these trust resources on behalf of the public, protects migratory birds, threatened and endangered species, and their supporting ecosystems. Sharon Steel damage settlement funds will be used to restore, replace, or acquire the equivalent of these natural resources (trust resources) injured by contaminants from the site.

The DOI and the State of Utah signed a Memorandum of Understanding (MOU) to cooperate as co-trustees in planning and implementing resource restoration with Sharon Steel settlement funds. The Trustee Committee outlined the following project goals: 1) To restore, replace, enhance, or acquire appropriate natural, functioning habitats along the Jordan River corridor for the benefit of identified trust resources; 2) To ensure that funds are utilized to provide maximum benefits for trust resources; and 3) To ensure the provision of benefits to trust resources in perpetuity. Restoration alternatives to meet these goals were identified. These alternatives included: a) No-action or natural recovery, b) Restoration on the Sharon Steel/ Midvale Slag sites, and c) Jordan River corridor replacement/enhancement of habitat for trust resources. Due to its protective and cost effective nature, replacement/enhancement of resources in the Jordan River corridor was chosen as the preferred alternative for enhancement of wetland and riparian migratory bird habitats.

The primary steps towards achievement of Sharon Steel restoration goals were subsequently identified as: 1) Definition of restoration targets in terms of species and habitats, 2) Development of criteria to consider when identifying and ranking prospective projects, 3) Identification of restoration tools or activities and solicitation of cooperative project proposals, 4) Identification and ranking of specific restoration projects (cooperative proposals) and/or sites, 5) implementation of selected project(s), and 6) monitoring of the project(s) to ensure long-term viability.

This Sharon Steel Restoration Plan (Plan) describes the Jordan River preferred alternative restoration projects selected, including the location, size (acreage), cost and cooperators of each project. Close cooperation among all programs in the Jordan River corridor (e.g., the Utah Reclamation Mitigation and Conservation Commission (CUP), Salt Lake Regional Trails Council, Jordan River Parkway plans, Jordan River Sub-basin Watershed Management Council, etc.) has ensured cost-effective expenditure of public funds, increased success of all programs, and provided maximum benefits to the Jordan River ecosystem. Cooperators will work with the Service to implement restoration projects.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
TABLE OF CONTENTS	ii
LIST OF TABLES	iii
LIST OF FIGURES	iv
LIST OF PHOTOGRAPHS	v
INTRODUCTION	1
BACKGROUND	3
TRUST RESOURCES	6
RESTORATION ALTERNATIVES	11
Natural Recovery (No-action)	11
Restoration on the Sharon Steel/Midvale Slag Superfund sites	12
Jordan River Corridor Replacement/Enhancement of Habitat for Trust Resources	13
PREFERRED ALTERNATIVE	13
1. City of South Jordan Riverway Wildlife Enhancement Project	14
2. Audubon/TreeUtah Migratory Bird Habitat Restoration Project	18
3. City of West Jordan Natural Habitat Restoration Project	23
SCHEDULE AND BUDGET	27
ENVIRONMENTAL COMPLIANCE	28
REFERENCES	33
APPENDIX - Comment Received and Response	35

LIST OF TABLES

Table 1	Project Cooperators	
	South Jordan Riverway Wildlife Enhancement Project	15
Table 2	Projected Funding Sources	
	South Jordan City Riverway Wildlife Enhancement Project	18
Table 3	Project Cooperators	
	Audubon/TreeUtah Migratory Bird Habitat Restoration Project	20
Table 4	Projected Funding Sources	
	Audubon/TreeUtah Migratory Bird Habitat Restoration Project	23
Table 5	Project Cooperators	
	West Jordan Natural Habitat Restoration Project	24
Table 6	Projected Funding Sources	
	West Jordan Natural Habitat Restoration Project	27
Table 7	Costs and Acres Restored	
	For Each Restoration Project	28

LIST OF FIGURES

Figure 1. Locations of Sharon Steel and Midvale Slag Superfund sites on the Jordan River in Salt Lake County, Utah.	4
Figure 2. Sharon Steel tailings mapped in relation to the 1937 and 1990 Jordan River channels .	5
Figure 3. South Jordan Riverway Wildlife Enhancement Project Conceptual Restoration Plan . .	17
Figure 4. Audubon/TreeUtah Migratory Bird Habitat Restoration Project Conceptual Restoration Plan	22
Figure 5. West Jordan Natural Habitat Restoration Project Conceptual Restoration Plan	26

LIST OF PHOTOGRAPHS

Photograph 1. Project View South Jordan Riverway Wildlife Enhancement Project	16
Photograph 2. Project View Audubon/TreeUtah Migratory Bird Habitat Restoration Project . . .	21
Photograph 3. Project View West Jordan Natural Habitat Restoration Project	25

INTRODUCTION

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, commonly known as "Superfund," provides for restoration of natural resources lost or injured by release of hazardous substances. Restoration is accomplished using damage settlements (dollars) collected from those responsible for the hazardous releases. Cleanup of Superfund sites (also referred to as "remediation") eliminates or reduces the potential for future contamination, but may not fully restore resources that were destroyed or injured by the release of hazardous substances. Federal and State agencies responsible for natural resources may therefore act on behalf of the public as "trustees" in restoring injured natural resources by using damage settlements from parties responsible for the contamination. Specific DOI procedures for assessing natural resource injuries that result from release of a CERCLA defined hazardous substance are found in the Code of Federal Regulations (CFR)- 43: Part 11, as amended, in the Federal Register, 59 FR 142281 (March 25, 1994).

The Secretary of the Interior has been designated to act on behalf of the public as trustee for natural resources managed or controlled by the DOI. Natural resources under the Secretary's trusteeship include migratory birds and endangered species and their supporting ecosystems. The U.S. Fish and Wildlife Service (Service) is the designated DOI representative for management of these species. State natural resource trustees have been designated to act on behalf of the public for natural resources, including their supporting ecosystems, within the boundary of a state, belonging to, managed by, controlled by, or appertaining to such state. The Governor of the State of Utah has designated the Utah Department of Environmental Quality as the trustee for natural resources for the State of Utah. Under the requirements of CERCLA, natural resource trustees are mandated to pursue damages for injuries to trust resources that have been injured, destroyed, or lost as a result of a release of hazardous substances from a Superfund site(s). Any natural resource damages received, either through negotiated settlements or natural resource damage assessment, will be used to restore, replace, or acquire the equivalent of those natural resources that have been injured.

Under damage assessment, injury is an adverse biological, chemical, or physical effect on natural resources, such as death, decreased population, or lost services (hunting opportunities, ecosystem functions). Damages are the estimated dollar values of the injured resources, determined either through damage assessment studies or negotiation. This damage settlement was obtained for migratory birds and endangered species, including their supporting ecosystems, through negotiation in the Sharon Steel Corporation bankruptcy proceedings so a natural resource damage assessment was not conducted prior to the settlement. The State of Utah did not participate in this settlement therefore other state-protected wildlife resources were not covered in the settlement or the restoration plan.

In 1991, the U.S. Department of the Interior (DOI) was awarded a \$2.3 million damage settlement to compensate for injury to Federally-protected "Trust" natural resources (i.e., hereafter trust resources) caused by release of lead and arsenic from Sharon Steel and Midvale Slag Superfund sites along the Jordan River. This restoration funding for Jordan River injured trust resources was awarded as part of a larger bankruptcy settlement obtained from the Sharon Steel Corporation, UV Industries, and the Atlantic Richfield Corporation (ARCO), to release them from future liability for the Sharon Steel Superfund site and a portion of the Midvale Slag Superfund site.

Under CERCLA guidelines, this damage settlement can only be used for "restoration" (i.e., to restore, rehabilitate, replace, and/or acquire the equivalent) of the Federal trust resources injured, destroyed, or lost as a result of the release of hazardous substances from these sites. These

injured trust resources, which include migratory birds, threatened and endangered species, and their supporting ecosystems along the Jordan River, are also protected by the State of Utah. Therefore, the State of Utah and the Department of Interior are designated co-trustees for these injured trust resources.

This restoration process is being implemented by the Department of Interior, through the U.S. Fish and Wildlife Service (Service), and the State of Utah under authority of a 1991 Memorandum of Understanding. This Restoration Plan (Plan) proposes natural resource restoration through cooperative projects implemented in partnership with State agencies, county and local governments, Federal agencies, and nonprofit organizations.

The following Sharon Steel restoration goals were developed from the DOI damage assessment regulations:

1. To restore, enhance, replace, and/or protect appropriate natural, functioning habitats along the Jordan River corridor for the benefit of identified trust resources.
2. To ensure that restoration funds are used to provide the maximum benefit for trust resources. (Maximum benefit is stipulated since the damage settlement was not enough to provide complete restoration.)
3. To ensure the project provides benefits to the trust resources in perpetuity.

Furthermore, DOI damage assessment regulations require evaluation of various restoration alternatives before initiation of projects. Alternatives may range from intensive actions to restore resources and their lost services to baseline conditions as quickly as possible, to natural recovery with minimal management actions. Evaluation of the no-action alternative is required by CERCLA to 1) determine if restoration is really needed and 2) provide a baseline for comparison when evaluating other alternatives.

Under CERCLA, natural resource trustees must complete a restoration plan and provide for public input before damage settlement dollars can be spent. Restoration of injured resources is subsequently accomplished through on-site restoration after cleanup has been completed, or through off-site enhancement or replacement of similar local resources via management practices, habitat reconstruction, acquisition, or other techniques.

The Sharon Steel Restoration Plan used the *SHARON STEEL DAMAGE SETTLEMENT: A Conceptual Restoration Plan* guidelines to identify specific projects to restore trust resources that were injured by release of hazardous substances from Sharon Steel and Midvale Slag Superfund sites. Methods for restoration include rehabilitation, replacement, and/or acquisition of equivalent trust natural resources and their habitats in the Jordan River corridor. Funded projects are being coordinated with other restoration efforts in the Jordan River Basin, however, expenditure of the Sharon Steel damage settlement money must be used exclusively for the provision of permanent benefits to trust resources. Other values such as recreation or improved water quality are secondary to this primary purpose of natural resource restoration.

BACKGROUND

Sharon Steel and Midvale Slag were originally a single facility owned and operated by United States Smelting, Refining, and Mining. They currently exist as separate Superfund sites along the Jordan River in Midvale, Utah (Figure 1). These were listed as Superfund sites based on the human health and environmental risks posed by mining wastes at each site, downstream contamination, and windblown tailings and smelter stack emissions (fallout) off-site (CDM 1988).

Sharon Steel operated as a custom ore milling facility from 1906 to 1971 and ores processed at the site supplied the Midvale Smelter and several other smelters. The mill was closed when the Sharon Steel Corporation purchased the facility in 1971 from United States Smelting, Refining, and Mining. The site today includes about 270 acres and contains an estimated 12 million tons of mine tailings from 1 to 60 feet in depth. Lead and arsenic are the most significant toxic contaminants on the site, though cadmium, zinc, nickel, mercury, and other heavy metals are also present. The Jordan River is contaminated by tailings deposition and runoff adjacent to and downstream from the site. The soils of an adjacent residential area are contaminated with lead as a result of wind-blown tailings and smelter fallout (CDM 1990).

Midvale Slag, located immediately north of the Sharon Steel site, encompasses about 300 acres. Various smelting wastes (slag, dross, baghouse dust, etc.) are present on approximately one-half of the site, the result of smelter operations from 1902 to 1958. An estimated 2 million tons of slag currently exist at Midvale Slag. Heavy metals, most notably lead and arsenic, are also the primary contaminants of concern at the site (CDM 1988).

Aerial photographs taken in 1937 show that tailings from Sharon Steel were deposited in the Jordan River floodplain and eroded into the river. In the 1950's, the Jordan River was routed to the west around the Sharon Steel site by channelization for flood control purposes. By 1965, tailings from Sharon Steel had completely buried the old Jordan River channel (Figure 2). During operation of the Sharon Steel mill, the tailings ponds were covered with shallow water that attracted large numbers of waterfowl during migration periods. Though dead birds were reported from that period, no documentation exists to confirm numbers or species. The tailings ponds have been dry since cessation of mill operations, except for temporary impoundment of water after heavy precipitation.

Though slag from the smelter at Midvale Slag was also placed directly in Jordan River floodplain wetlands, it is not known whether slag was placed in the Jordan River itself. In 1975, a series of sewage lagoons were developed in a wetland complex located on the north end of the site. In these wetlands, special construction measures allowed for development of treatment lagoons despite the "swampy nature of the soils" in the area. In 1985, the facility was closed and the majority of the original wetlands were filled.

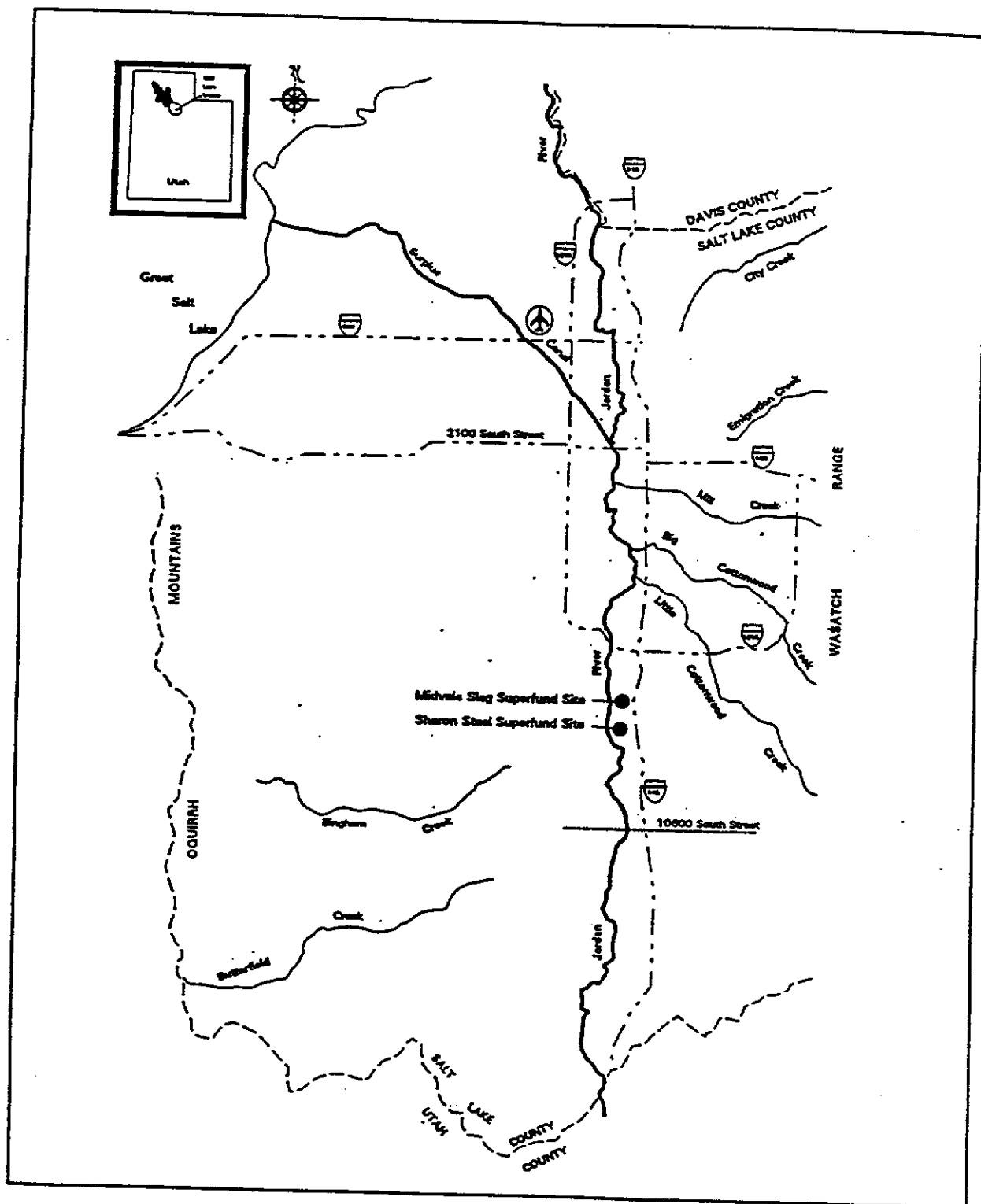


Figure 1. Locations of Sharon Steel and Midvale Slag Superfund sites on the Jordan River in Salt Lake County, Utah.

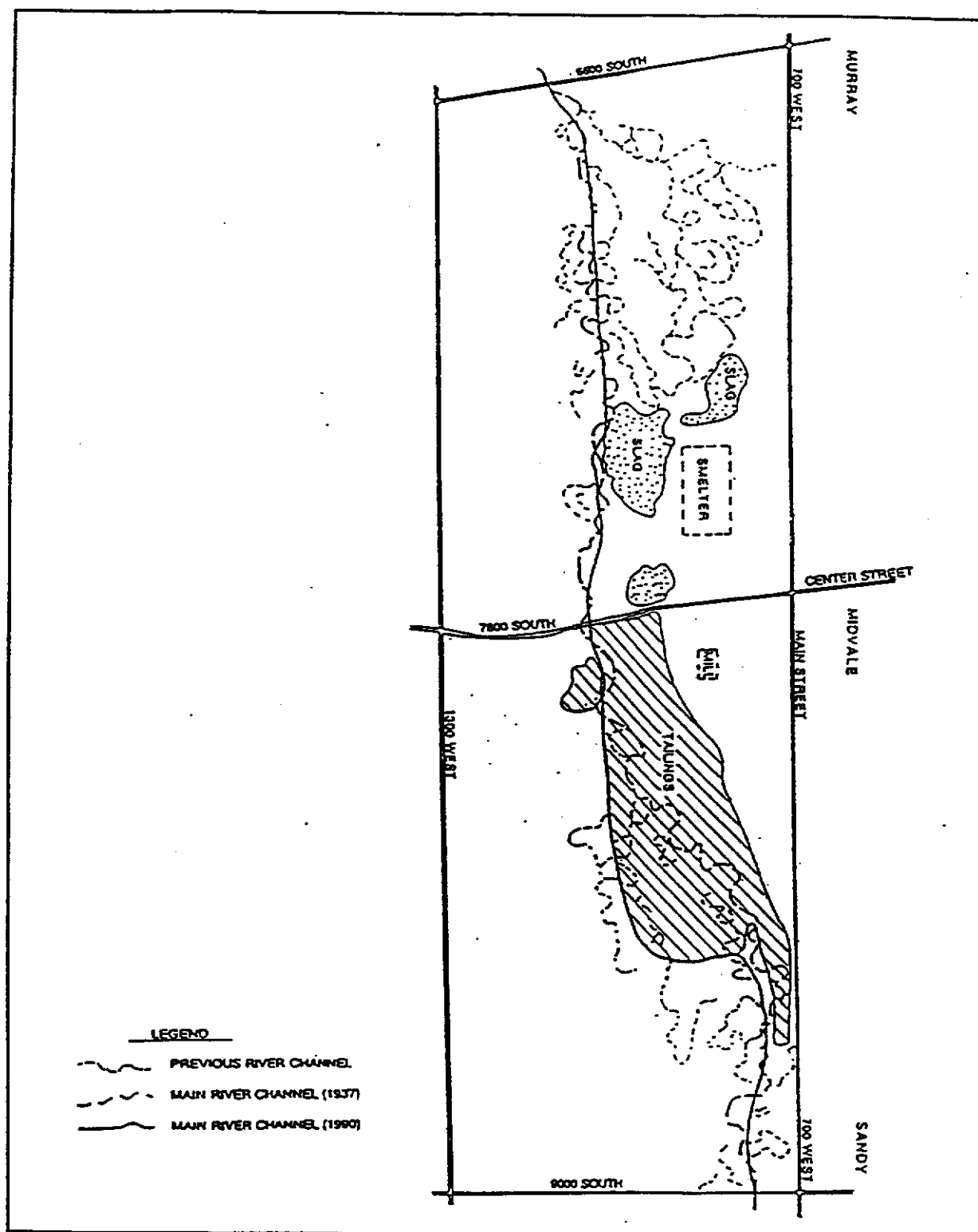


Figure 2. Sharon Steel tailings mapped in relation to the 1937 and 1990 Jordan River channels.

Overall, hazardous substances from Sharon Steel and Midvale Slag impacted trust resources in the Jordan River corridor through habitat destruction and heavy metal contamination. Several hundred acres of riverine wetlands are buried by tailings and slag, and remaining wetlands on the Sharon Steel site are known to be heavily contaminated with lead and arsenic. Erosion and deposition of tailings (and possibly slag) into the Jordan River have contaminated river sediments downstream from the sites, possibly as far downstream as Farmington Bay on the Great Salt Lake.

Site remediation activities for the Sharon Steel site are detailed in the Environmental Protection Agency (EPA) and Utah Division of Environmental Response and Remediation (DERR) Record of Decision (1993) and are now complete. Remediation consisted of removing contaminated soils from OU2 (residential areas surrounding the site) and storing them in a repository on OU1 (Mill site and tailing pile). The tailings were then consolidated and pulled away from the river and capped with a synthetic liner and 2 foot vegetated soil cap. An interceptor trench was installed along the eastern edge of the tailings to control subsurface lateral groundwater flow and monitoring wells were installed to sample and test groundwater. Remediation of the site also included cleanup and restoration of approximately 13 acres of remnant natural wetlands in the original Jordan River channel.

Midvale Slag remediation alternatives are currently being developed for slag, mixed smelter wastes, and groundwater. One alternative for the smelter wastes includes on-site stabilization and capping. Alternatives for slag remediation include no action, partial excavation of the slag for other uses or consolidation and capping. Groundwater remediation alternatives include no action with monitoring, treatment and discharge to the Jordan River, or groundwater modeling and monitoring. At both sites, contamination of underlying groundwater resources and/or capping of contaminated soils made it impossible to clean and restore buried wetlands to safe levels for restoration of trust resources. Although remediation of the Sharon Steel and Midvale Slag Superfund sites will prevent further releases of lead and arsenic from these sites into the environment, it will not restore or replace trust resources impacted by past releases or cleanup activities.

TRUST RESOURCES

Injuries to trust resources are normally evaluated and quantified through studies conducted during the natural resource damage assessment process. However, since a damage assessment was not conducted for Sharon Steel or Midvale Slag, existing information on migratory birds and endangered species along the Jordan River corridor provided a description of trust resources and their associated habitats that may have been adversely affected by Sharon Steel and Midvale Slag operations. Primary sources of this information included accounts and reports from the DWR, Service, Salt Lake County, University of Utah, local birders, historical records, and published information in wildlife journals, monographs, and technical bulletins. These sources are listed in the References section of this report.

The Federal government and the State of Utah jointly protect migratory birds and threatened and endangered species and their habitats. The Utah State Division of Wildlife Resources (DWR) is charged with the duty to protect, propagate, manage, conserve, and distribute protected wildlife throughout the state. Federal responsibilities for migratory birds are defined by the Migratory Bird Treaty Act (16 U.S.C. § 703-711). Most native North American birds are protected under this Act, including waterfowl, shorebirds, hawks, owls, and songbirds, and many of these are among the impacted trust resources associated with Jordan River wetland and riparian habitats. The list of bird species protected by this law are published in the Code of Federal Regulations (CFR) 50, Part 10.13. Federal authority for protection of threatened and endangered species is contained in the Endangered Species Act (16 U.S.C. § 1531-1543). The peregrine falcon is an endangered bird species in the Jordan River system impacted by Sharon Steel contaminants.

The bald eagle is a threatened bird species impacted by Sharon Steel contaminants. Bald eagles are also protected under the Bald and Golden Eagle Protection Act (16 USC §668-668). Ute Ladies'-tresses (*Spiranthes diluvialis*), a Federally-listed threatened orchid, may have also been affected by Sharon Steel contaminants.

Jordan River Corridor

Trust resources affected by the Sharon Steel and Midvale Slag Superfund sites are primarily migratory birds of the Jordan River system. Therefore, the restoration project area is the Jordan River corridor (i.e., the Jordan River between Utah Lake and the Great Salt Lake, its flood plain, and all directly adjacent bottom lands and riparian/wetland habitats). Tributaries of the Jordan River are not included in the project area; they are higher in elevation and support different plant and bird communities.

The Jordan River originates as outflow from Utah Lake and flows north, through urban Salt Lake City and its surrounding suburbs, approximately 55 miles to a delta in Farmington Bay on the Great Salt Lake. During the 1950's channelization of the river for flood control dramatically altered wetland and riparian vegetation in the river corridor and degraded habitat conditions for migratory birds and endangered species. Local riparian vegetation has been reduced in extent, overrun with non-native plant species, and grazed by livestock. Due to alteration of wetland hydrology with channelizing and river dredging, most off-river oxbow wetlands (remnants of old river channels) are now dry, and the overall floodplain has decreased in width with urban encroachment. The remaining habitat is rapidly being converted to housing developments, commercial and industrial complexes, and developed parks/recreation areas. Only a few high quality wetland and riparian areas remain.

Contaminants at the Sites

The principal hazardous substances at the Sharon Steel and Midvale Slag sites are lead and arsenic. Both contaminants are toxic to humans and most other living creatures. Lead is a heavy metal; its compounds are potentially harmful or toxic (Jenkins 1981). Lead is a cumulative poison. It can bioaccumulate, and is listed by the Environmental Protection Agency (EPA) as a carcinogen. All measured effects of lead on living organisms are adverse, including those negatively affecting survival, growth, learning, reproduction, development, behavior, and metabolism (Eisler 1988b). Effects of sublethal concentrations of lead on fish include increased mucous formation, delayed embryonic development, suppressed reproduction, inhibition of growth, and fin erosion (Rompala et al. 1984). In vertebrates, sublethal lead poisoning is characterized by neurological problems, kidney disfunction, enzyme inhibition, and anemia (Leland and Kuwabara 1985). In birds, lead accumulated in food or from ingested shot and sinkers can cause death, and has also been implicated in decreases in eggshell thickness, growth, ovulation, and sperm formation (Rompala et al. 1984). Elevated concentrations of lead in water are particularly toxic to many species of algae (Leland and Kuwabara 1985). Synergistic effects of lead and cadmium and additive effects of lead, mercury, copper, zinc, cadmium, and mercury have been documented for aquatic biota (Demayo et al. 1980).

Arsenic is a nonmetallic element, it has long been a concern, primarily because small amounts are toxic to humans (Hem 1985). Uptake of arsenic by phytoplankton can be significant (Lindsay and Sanders 1990) and it is generally found in higher concentrations in organisms low in the food chain (Eisler 1988a). It is a teratogen and carcinogen that can cause fetal death and malformations in many species of mammals. It also has the potential to bioaccumulate in tissues of mammals, birds, fish, mosses, lichens, and algae (Jenkins 1981).

Migratory Birds Impacted by Contaminants

Predaceous bird species would be most impacted by the release of lead and heavy metals from Sharon Steel and Midvale Slag, because they are higher on the food chain. Birds that eat fish, mammals, or other birds, and birds that are closely tied to aquatic habitats where contamination can be deposited in the sediments are most likely to have been affected. The following types of birds are most likely to have been impacted by contaminants in the Jordan River system:

- Fish-eating birds: such as osprey, bald eagles, terns, herons and cormorants, kingfishers, pelicans, mergansers, grebes, and others.
- Water birds that feed on aquatic invertebrates or vegetation: Shorebirds, waterfowl, grebes, rails, gulls, cranes, and others.
- Aerial feeding birds which eat aquatic insects: Swallows, Franklin's gulls, flycatchers, nighthawks, and others.
- Floodplain birds of prey that primarily eat mammals and other birds: Hawks, falcons, harriers, owls, shrikes, and others.
- Terrestrial birds that feed in riverine wetlands: Warblers, blackbirds, wrens, vireos, grosbeaks, sparrows, finches, thrushes, robins, and others.

Few bird studies have been conducted on the Jordan River. A wildlife inventory was conducted in 1984 in the area from 9400 South Street to Bluffdale, Utah (Smith and Greenwood 1984) for the proposed Lampton Reservoir. This study emphasized game species, but also documented the occurrence of 82 bird species. The 1986 Jordan River Wetlands Advance Identification Study (WAIDS) recorded 76 bird species along the Jordan River corridor between 2100 South and the Jordan Narrows (Halpin 1987). An annual state-wide riparian songbird study, begun by the DWR in 1992, has documented 36 species during counts at two sites along the Jordan River (Howe 1993). A total of 43 species have been documented on the Jordan River during Christmas Bird Counts conducted by the Salt Lake Chapter of the National Audubon Society. Combined sightings from all sources total 136 documented bird species.

The most common Jordan River species observed during both the WAIDS and DWR studies include a mixture of wetland inhabitants (e.g. the white-faced ibis, red-winged blackbird, killdeer, and black-crowned night-heron) and species associated with urbanized or disturbed habitats (e.g. the European starling, western meadowlark, black-billed magpie and California gull). By comparison, the most common species detected in state-wide riparian surveys were the American robin, rufous-sided towhee, lazuli bunting, yellow warbler, mourning dove, broad-tailed hummingbird, warbling vireo, solitary vireo, western wood-pewee, and house wren (Howe 1993). Observed abundance of wetland species along the Jordan River is related to the presence of emergent wetland habitat, such as cattail and bulrush marshes, in the upper reaches of the river.

A number of bird species that are common in riparian areas throughout Utah are rare or absent on the Jordan River. For example, the warbling vireo, willow flycatcher, western wood-pewee, and house wren were not detected during the WAIDS study or the Lampton Reservoir study, even though they are common in riparian areas throughout the West. It is not known whether absence of these birds is due to contamination or other environmental factors such as degradation of historical riparian habitat. Non-native tree and shrub species, such as Russian olive

(*Elaeagnus angustifolia*) and salt cedar or tamarisk (*Tamarix ramosissima*) dominate riparian habitats in the Jordan River corridor, rather than native cottonwoods (*Populus* spp.) and willows (*Salix* spp.).

Endangered Species Potentially Present at the Site

The following species are listed as threatened or endangered by the U.S. Department of the Interior (1994) under provisions of the Endangered Species Act of 1973, as amended.

Bald Eagle

The bald eagle is listed as Threatened. Bald eagles are present along the Jordan River all year and nest on the lower reaches of the river. A major wintering area, with over 100 eagles, is located on the lower Jordan River and Farmington Bay. Bald eagles feed primarily on fish and waterfowl and were listed as endangered in 1978 due to population declines caused by pesticide contamination through the food chain. Due to extensive protection and restoration efforts, their population numbers are increasing and in 1995, the bald eagle was down-listed to threatened. They are very sensitive to lead and other heavy metals.

Peregrine Falcon

Peregrine falcons, an endangered species listed in 1970, are present in the Salt Lake Valley year-round. They nest near the mouth of the Jordan River in Salt Lake City. Peregrines feed exclusively on birds and are especially attracted to areas with high duck and shorebird populations. They were listed as endangered because of population declines caused by pesticide contamination. The species is very sensitive to lead and other heavy metal.

Ute Ladies'-tresses

The Ute Ladies'-tresses orchid is an herbaceous flowering plant in the orchid family. It grows along streams, bogs, and open seepage areas in cottonwood and willow communities. Although found in other locations, it was last documented along the Jordan River during the 1950's. Loss of its habitat from physical alterations is the primary reason why this plant was listed as a threatened species. The role of heavy metal contamination on its decline is unknown.

Spotted Frog

The May 1993 Service determination announced that listing of the spotted frog in Utah and several other portions of its range was warranted but precluded by higher listing priorities. A conservation plan is currently being written by the Service and the State of Utah.

Though spotted frogs were formerly found in Jordan River wetlands, particularly those fed by springs, their presences has not been documented in recent years. Spotted frog populations along the Wasatch Front and other areas in Utah are threatened by habitat degradation caused by wetland destruction, grazing, water diversion, reduced water quality, and introduction of non-native fish and amphibians. The contribution of contamination from the Sharon Steel Superfund Site towards decline of Jordan River populations is unknown, however, contamination is suspected to be responsible for the decline of many types of amphibians worldwide (Hall and Henry 1992).

Habitats for Migratory Birds and Endangered Species

Habitat is the environment where a plant or animal lives. It consists of the physical and biological characteristics that provide for growth, reproduction, and survival of a plant or animal. Birds use habitat to obtain food, water, shelter from weather conditions, protection from predators, places to nest and rear young. Habitat is also used as travel corridors, and to meet other special needs such as a source for nesting material or gravel to aid food digestion. Habitat for birds is often described in terms of plant communities because species numbers are closely related to availability and quality of their favored plant communities.

Plant communities along the Jordan River are classified as "cold desert" riparian (Hedges 1992). Riparian areas comprise less than three percent of the Utah land surface but support the highest diversity and density of birds of any environment in the State. In the Great Basin desert, the riparian combination of water, dense vegetative cover, and abundant food resources (e.g., insects and berries) is especially important to birds and other wildlife. Two-thirds of Utah bird species use riparian areas during some portion of the year, and many of these species are totally dependent upon riparian habitats during the nesting season.

The aquatic ecosystem of the Jordan River has been greatly altered. Narratives from the 1800's indicate that the Jordan River was wider and flowed faster than today (Lockerbie 1949; Bryant 1967; Brooks 1989; Madsen 1989). The Jordan River flowed from a small marsh in Utah Lake and entered the Great Salt Lake through a vast system of bulrush marshes and cattails. Cottonwoods (*Populus* spp.) were probably sparsely distributed along the Jordan River valley and extensive willow (*Salix* spp.) stands dominated the riparian vegetation. Except near the mouth of the river, which had a clay or mud bottom, the river channel substrate was composed of sand or gravel. The original Jordan River riparian zone varied in width from tens of feet, as most of it is today, to nearly a mile wide. The river meandered widely within its floodplain in some places, and created a rich mosaic of trees, shrubs, wet meadows, oxbow lakes, and uplands. In addition to the Jordan River, riparian communities were also present along its major tributaries, Big and Little Cottonwood creeks, Mill Creek, and City Creek. Native trees and shrubs present along the Jordan River and these tributaries probably included narrowleaf cottonwood (*Populus angustifolia*), boxelder (*Acer negundo*), sandbar willow (*Salix exigua*), and peachleaf willow (*Salix amygdaloides*).

Gunnison, described the Jordan River in October, 1849 (Madsen 1989) as:

"... descending on a swift current. The river is about 25 feet wide on the average, the channel shifting from side to side and over shoals of gravel from 2 feet to 6 inches deep -- In some places there are grass clumps at surface of water & often gravel islands divide the channel into two narrow ones which run under the willows overhanging the banks ... The current of the river is so strong and the channel so crooked that we are obliged to transport the boat on a wagon and to use it for crossing the stream only..."

C.W. Lockerbie (1949) described the Jordan River that he remembered from the 1890's:

"The Jordan River carried much more water then, consequently had a broader and more sharply defined channel than today. The banks on the undercut slope were generally vertical and non-vegetated, whereas the opposite side was covered with sand bar willows from ... stream edge back over the reclaimed channel to the valley floor. But before reaching the valley level, there often was a terrace (or former river level) on which grew an apparently different type of willow, though it may have been only the mature sand bar species ... Stands of from one to five acres ... were common then..."

By the 1930's, the Jordan River had been transformed and more dramatic changes occurred after that. Rip rap and other artificial bank stabilization methods were used extensively, and most

of the Jordan River was channelized between 1950 and 1970 (CH₂M Hill 1993). Physical impacts of channelization included changes in form and substrate, depth and width, surface area, length, configuration and bedform, substrate, cover, gradient, flow and velocity, hydrograph, solids, sediment load, light penetration, and water temperature. Chemical characteristics that were influenced included dissolved oxygen, dissolved solids, oxygen demand, nutrients, and toxic substances (Simpson et al. 1982). Channelization increased bank erosion, decreased the flood carrying capacity, decreased the capacity to remove nutrients and toxic substances, denuded bank vegetation, and removed pools, riffles, point bars, and undercut banks from the Jordan River. Continued dredging of the channel has further entrenched the river and lowered the water table within the floodplain. As a result, most of the wetlands in the floodplain have been degraded (CH₂M Hill 1993).

Fertile floodplain soils are attractive for agriculture and other human activities. Such development activities have resulted in development and loss of riparian habitat throughout the West. It is estimated that Utah has lost about 30 percent of its wetland and riparian habitat since the mid-1800's (Dahl 1990) and the Jordan River WAIDS study (Jensen 1987) estimated that Jordan River wetlands decreased 29 percent between 1974 and 1986. Due to Utah's large and rapidly increasing Wasatch Front population, there is intense pressure to develop remaining wetlands for housing and commercial activities such as office complexes and golf courses.

Few historic wetlands or riparian areas remain along the Jordan River. Of those that do, most have been impacted by stream channelization, grazing, invasion of non-native vegetation, housing developments, contamination, and other urban-related problems. While Jordan River development has reduced wildlife restoration options, it also has focused public attention on the natural resource values of riparian areas and provided opportunities to correct and minimize urban-related wildlife problems.

RESTORATION ALTERNATIVES

A total of three alternative restoration action plans were reviewed under CERCLA restoration guidelines: Natural recovery (No-Action), Restoration on the Sharon Steel/Midvale Slag Superfund sites, and Jordan River Corridor replacement/enhancement of habitat for trust resources. These alternatives are discussed in this section.

Natural Recovery (No-action)

Evaluation of the natural recovery (No-action) alternative is required by CERCLA to determine if restoration is really needed and to provide a baseline for comparison with other alternatives.

The "No action" alternative would allow the Jordan River to remain in its current condition and would likely require hundreds of years for natural resource recovery under the best conditions. However, it is expected that future development in the Jordan River corridor will continue to degrade riparian habitat and to reduce the ability of natural resources to recover from Sharon Steel impacts. Cumulative impacts of continuing urbanization and industrialization along the river corridor could effectively eliminate remaining habitat and prevent future restoration efforts.

EPA remediation of these Superfund sites will not result in restoration of trust resources because the privately-owned Superfund site properties are likely to be converted to industrial or other uses that would preclude natural recovery of trust resources. Furthermore, the level of EPA remediation did not clean up the site to the extent required for re-establishment of a fully functional native community. Since current land uses in the Jordan River corridor are preventing recovery of

trust resources, it is expected that trust resources will continue to decline in the impacted areas of the Jordan River corridor if no restoration action is taken. Project mission and goals cannot be met under the No-action Alternative.

Restoration on the Sharon Steel/Midvale Slag Superfund sites

Under this alternative, restoration on the Sharon Steel/Midvale Slag Superfund sites would involve construction of additional wetlands and riparian areas on and adjacent to a protective capping layer.

There is a potential for spread of contaminated materials during restoration due to construction activities. This, and the elevation of soils above local water tables and subsequent loss of natural wetland hydrology precluded development of wetlands on the Sharon Steel/Midvale Slag sites, after capping of tailings. Wetlands could have been constructed if tailings had been removed, however, residual soil contaminant levels are not low enough to ensure protection of wildlife. Though residual contaminant levels in remediated soils and bottom sediment may be considered safe for humans, these cleanup levels may not be safe for wildlife species whose life-cycles are connected with and dependent upon certain nutrient cycles of contaminated soils.

In this wetland setting, the current Sharon Steel remediation target of 500 parts per million lead is not protective of wildlife and poses an unacceptable risk to migratory birds. Residually contaminated wetlands have the potential to attract and subsequently injure bird species via sub-lethal effects (e.g., decreased fertility, mutation, etc). Lead could be ingested by sediment-dwelling invertebrates and passed on to migratory birds and endangered species through the food chain. Overall, plans for restoration on the Sharon Steel/Midvale Slag sites would not assist recovery of trust resources and may violate provisions of the Migratory Bird Treaty Act.

As part of the Sharon Steel site remediation, the EPA removed contaminated sediments from 13 acres of on-site wetlands and is in the process of restoring these wetlands. The EPA and the DERR estimate (cost of wetland cleanup was included in the cost to cleanup the entire site, therefore exact cost of wetland cleanup is not known) that remediation cleanup of these 13 acres totaled approximately \$900,000 (a cost of \$69,000/acre), not including money needed to purchase "industrial zoned" Jordan River lands or to otherwise insure future protection and management for trust resources. At this price, only 33 acres of additional on-site wetlands could have been restored with the Sharon Steel damage settlement. Furthermore, the ensuing private ownership would not guarantee that restored habitat would be permanently protected and managed for wildlife.

As with the Sharon Steel site, the Midvale Slag site is also privately owned. Several major projects, including the construction of a major road across the site, a new bridge across the Jordan River, and a commercial industrial park, are already being considered for the property. These uses are not compatible with restoration and enhancement wildlife habitat.

Restoration on the Sharon Steel site would have required construction of wetlands and riparian habitat on potentially contaminated ground, and would have been less cost-effective than restoration and enhancement elsewhere in the Jordan River corridor. Total restoration, including placement of the river back into its original channel, was too costly for available funding, and infeasible given the current level of development.

Restoration of the Sharon Steel site would have been more costly, difficult, and time consuming than other alternatives. Pursuit of this alternative would not provide the maximum

possible benefits for trust resources without assurance of final cleanup strategies, future land ownership, and acceptable residual contamination levels.

Jordan River Corridor Replacement/Enhancement of Habitat for Trust Resources

This restoration alternative primarily involves habitat protection and enhancement along uncontaminated and minimally disturbed sections of the Jordan River corridor. Habitat enhancement is most desirable on public areas where land management practices could be compatible with trust resources in perpetuity. However DOI damage assessment regulations preclude federal acquisition of land for Federal management unless it is determined that restoration, rehabilitation, and/or other replacement of the injured resources is not possible.

Long-term protection of restoration sites by land acquisition or conservation easements would likely be the most effective way to protect them from future development. Acquisition of restoration lands for State, Federal, County, non-profit, or other public ownership would provide cost-effective restoration when compared with purchase of perpetual conservation easements. Acquisition costs are estimated to range from \$10,000 to \$30,000 per acre in the Jordan River corridor. Enhancement costs (e.g., for water control structures, vegetation establishment, etc.) are estimated to be \$20,000 or more per acre, depending on the specific restoration needs for each site. These Jordan River corridor enhancements will provide benefits to wildlife and endangered species over the long-term by enhancing native riparian habitat features (e.g., increasing plant community diversity and abundance, enhancing wetland hydrology, etc.).

Restoration site construction actions, including bank regrading and revegetation, installation of water control structures, debris removal, or restoration of the river to its original channel, may cause short-term degradation of water quality and cold-water fisheries by increased sedimentation. However, these actions will result in long-term water quality augmentation by increasing bank stability and reducing bank erosion once vegetation establishes. Restoration of a more natural Jordan River hydrologic regime would allow for an increase in wetland plant community diversity and abundance, and might also provide habitat for reintroduction of the Ute Ladies'-tresses.

Given proper implementation, this alternative meets the project's restoration mission and goals. Acquisition or some type of long-term protection would provide more permanent benefits to trust resources than the "No-action" alternative. Acquisition combined with active restoration measures would cost more per acre, but result in a more effective recovery of trust resources through the establishment of native riparian habitat.

PREFERRED ALTERNATIVE

The preferred option is Alternative 3, Jordan River corridor replacement/enhancement of habitat for trust resources. This alternative would provide for replacement of Jordan River trust resources similar to those that were injured with the least amount of money expended per resource unit. The restoration goals are stated in the introduction of this document and include the provision of benefits to trust resources in a manner which will provide maximum benefits in perpetuity. Acquiring property and restoring property on the Jordan River to a more native state is the best means to achieve the stated goals.

Sites for restoration along the Jordan River were selected through a competitive process. The selection process and criteria were outlined in the *SHARON STEEL DAMAGE SETTLEMENT: A Conceptual Restoration Plan* and then announced in the Commerce Business Daily (CBD) for solicitation. The technical team, made up of state and federal agencies with experience in disciplines such as wetlands, migratory birds and riparian habitat, was assembled to review and rank proposals received as a result of the solicitation in the CBD.

Each proposal was first reviewed on a technical basis for biological appropriateness and ranked according to the criteria in *SHARON STEEL DAMAGE SETTLEMENT: A Conceptual Restoration Plan*. Each proposal was then reviewed and ranked on a cost basis to assure cost effectiveness. Clarification and negotiation sessions took place with each sponsor before final rankings were given to each proposal. Based on the technical and cost rankings, proposals were then prioritized from the highest rank to the lowest rank. The Technical Committee then made recommendations to the Trustee Committee to enter into cooperative agreements with the project sponsors based on priorities established in the review process.

Following are summaries of the projects selected for funding:

1. City of South Jordan Riverway Wildlife Enhancement Project

A. City of South Jordan Riverway Wildlife Enhancement Project

The South Jordan Riverway Wildlife Enhancement Project involves the purchase, restoration, and protection of approximately 111 acres of diverse wetland, riparian, and upland habitats along the Jordan River flood plain between 11300 South and 10600 South in South Jordan City. The project site is located on the east side of the river approximately 3.0 miles south of the Sharon Steel/Midvale Slag Superfund sites. Since this is an upstream location, no heavy metal contamination associated with these sites is anticipated within the project area. The project is located in a historically agricultural area, primarily pasture land, that is quickly being converted to residential and commercial land use (Photograph 1).

Of the 111 acres, a core area comprised of approximately 60 acres of wetlands and riparian areas will be designated as the "Wildlife Preserve" and managed specifically as wildlife habitat, with an emphasis on neo-tropical migratory birds. Public access to this area will be discouraged. The remaining 51 acres will be designated as a "Buffer Zone" between the Wildlife Preserve and surrounding areas, including future commercial development that will occur on the benches east of the project site. The Buffer Zone will be managed as a wildlands park allowing limited human access along established trails. These trails will be soft surface trails located on the perimeter of the project and connect with the Provo/Jordan River Parkway Trail which will be located on the west side of the Jordan River (Figure 3).

The following goals have been established to provide the framework for achieving the long-term objective of providing habitat to trust resources injured by the release of heavy metal at the Sharon Steel / Midvale Slag Superfund Sites:

- Acquire, through purchase or conservation easement, lands designated within the boundaries of the project area. These lands will be managed as wildlife habitat in perpetuity.
- Eliminate livestock grazing.
- Stabilize the east bank of the Jordan River.
- Modify site hydrology in conjunction with other related projects (e.g., flood control of Willow creek) to create or enhance wetland areas with high migratory bird/wildlife habitat value.
- Eliminate undesirable plant species and exotic species and replace with desirable native species.

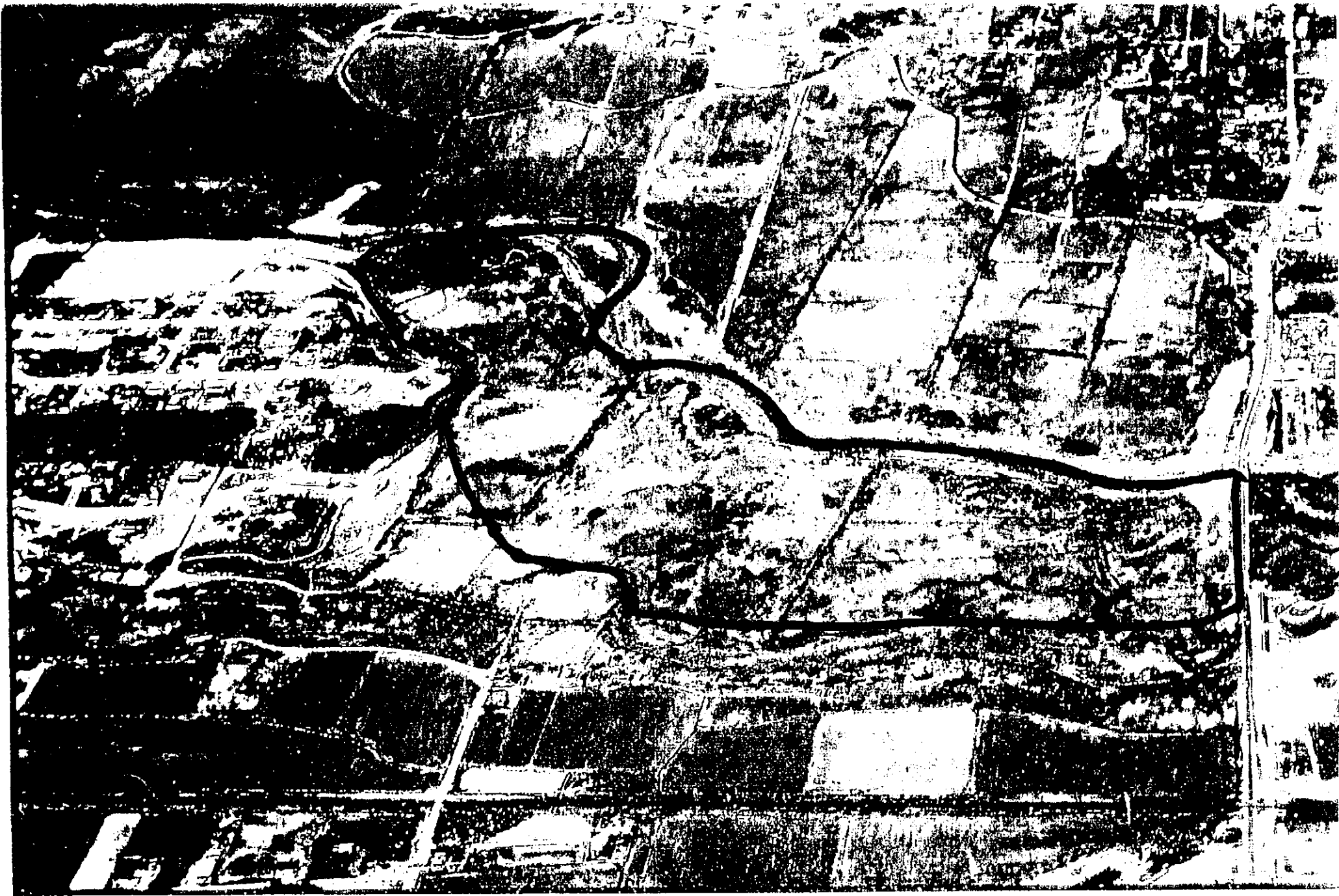
- Significantly increase the density and areal coverage of native shrub and tree complexes supporting neo-tropical migratory bird habitat

South Jordan City, the proposal sponsor, assembled a project team consisting of IHI Environmental, National Audubon and TreeUtah to assist in development and implementation of this part of the Sharon Steel Restoration Plan. The project cooperators, which contribute both in-kind services and money, represent a broad-based consortium of municipalities, non-profit organizations, public agencies, private organizations, and technical consultants (Table 1).

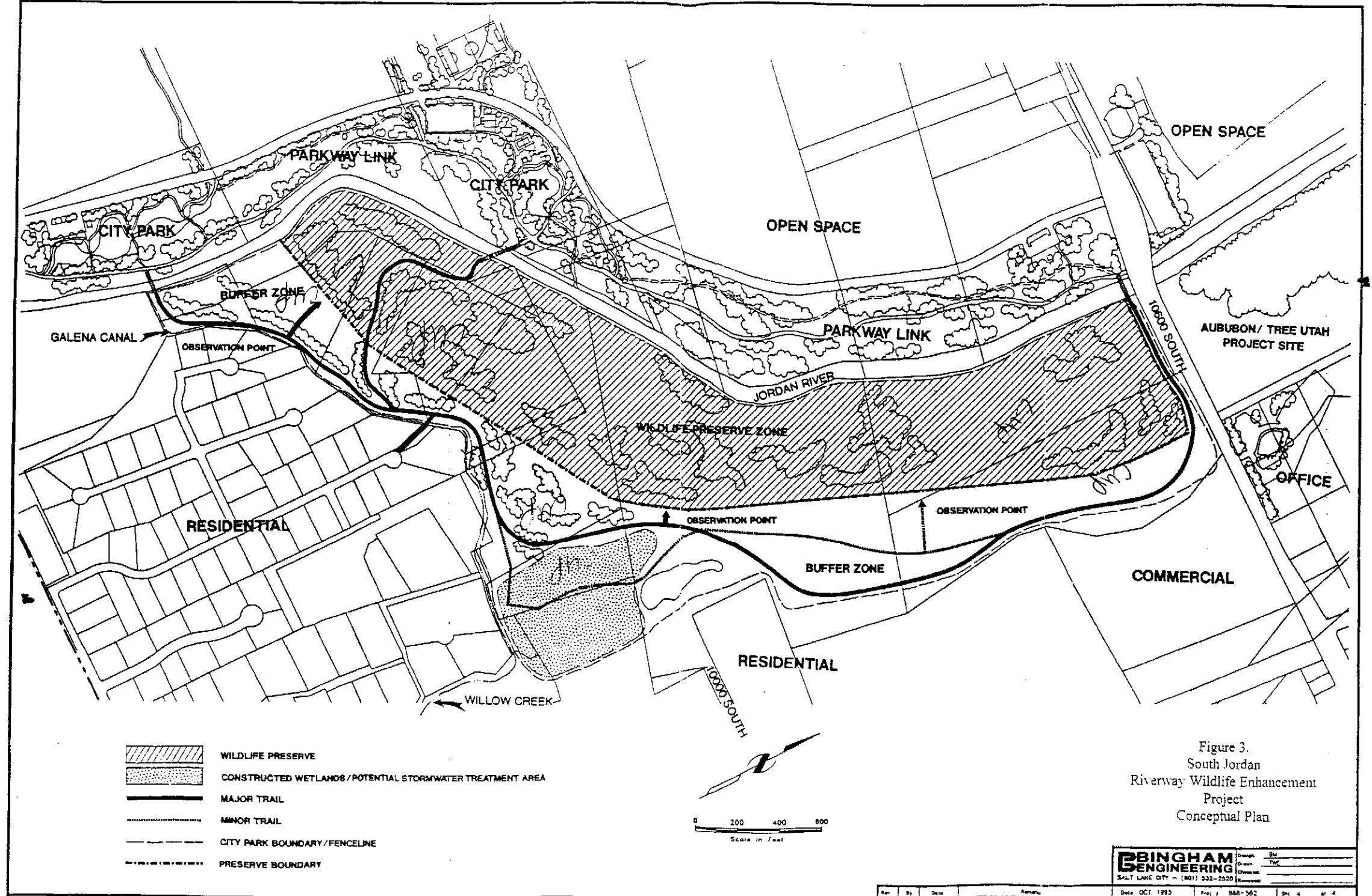
Table 1
Project Cooperators
South Jordan Riverway Wildlife Enhancement Project

Organization	Role	Representative
South Jordan City	Project Sponsor	Keith Snarr,
U.S. Fish and Wildlife Service	Project Oversight and Monitoring	Elise Peterson
National Audubon Society	Long-term Stewardship	Wayne Martinson
IHI Environmental	Project Design and Management	William T. Hopkins
Wasatch Front RC&D*	ID of Potential Funding Sources	David Spann
TreeUtah	Revegetation Support	Vaughn Lovejoy
URMCC (CUP)	Land Acquisition Funding	Catherine Quinn
Salt Lake County	Bank Stabilization with EPA funds	Steve Jensen
Division of Wildlife Resources	Bird Habitat Technical Advisor	Frank Howe, PhD.
Salt Lake County Fish and Game	Education Center	Keith Johnson
Utah National Guard	Earth Work/Heavy Equipment	Sgt.Mjr. Randy Bunker
Aqua Surveys	Technical Consultant	Randy Isham
Utah Dept. of Corrections	Planting/Exotics Control	Glenn Beagle
Utah Wildlife Rehabilitation, Inc.	Habitat Enhancement	Janice Caputo
Utah Open Lands	Negotiate Project Stewardship	Wendy Fisher

*Wasatch Front Resource Conservation & Development



Photograph 1. Project View of South Jordan Wildlife Enhancement Project



B. South Jordan City Riverway Wildlife Enhancement Project Budget

The South Jordan City Riverway Wildlife Enhancement Project demonstrates a highly developed partnership including several federal, state, nonprofit and private funding sources. The partnering involves the support of a broad base of varied disciplines and jurisdictions working together to achieve the common goal of restoring the Jordan River. It also demonstrates the need and support of the communities who will benefit from this project. The total cost of the project will be \$4,666,683 dollars which includes actual funds and in-kind services, with Sharon Steel Damage Settlement funds contributing dollars \$842,933 (Table 2).

Table 2
Projected Funding Sources
South Jordan City Riverway Wildlife Enhancement Project

Source of Funding	Funds	In-Kind Services	Total Costs
South Jordan	\$200,000	\$1,322,800	\$1,522,800
SSDS* (U.S. Fish and Wildlife Service)	\$842,933		\$842,933
URMCC (CUP)	\$919,950		\$919,950
EPA	\$220,000		\$250,000
Utah Department of Parks and Recreation	\$100,000		\$100,000
TreeUtah/Other Volunteer Plant Maintenance		\$528,000	\$528,000
National Guard		\$150,000	\$150,000
Private Funds	\$100,000		\$100,000
Salt Lake County Flood Control Funds	\$220,000		\$220,000
Utah Partners in Flight/Audubon		\$23,000	\$23,000
IHI Environmental		\$20,000	\$20,000
Utah Open Space		\$15,000	\$15,000
Wasatch Front RC&D*		\$5,000	\$5,000
Estimated Totals	\$2,602,883	\$2,063,800	\$4,666,683

*SSDS - Sharon Steel Damage Settlement

*Wasatch Front Resource Conservation & Development

2. Audubon/TreeUtah Migratory Bird Habitat Restoration Project

A. Audubon/TreeUtah Migratory Bird Habitat Restoration Project

The Audubon/TreeUtah Migratory Bird Habitat Restoration Project involves the purchase, restoration, and protection of approximately 73 acres of diverse wetland, riparian, and upland habitats along the Jordan River flood plain between 9800 South and 10600 South in South Jordan City and is adjacent to the South Jordan City Riverway Wildlife Enhancement Project. This project

site is located on the east side of the river approximately two miles south of the Sharon Steel/Midvale Slag Superfund sites. Due to this upstream location, the project lands are not impacted by heavy metal contamination from the Superfund sites. The project is located in a historically agricultural area, primarily pasture land, that is quickly being converted to residential and commercial land use (photograph 2).

The objective of the project is to restore and manage the site specifically for neo-tropical migratory birds. Public access to the area will be restricted entirely during the nesting season and otherwise limited to activities compatible with migratory birds and their habitats. There will not be trails on this project; however, the Provo/Jordan River Parkway Trail will be located on the opposite (west) side of the river (Figure 4).

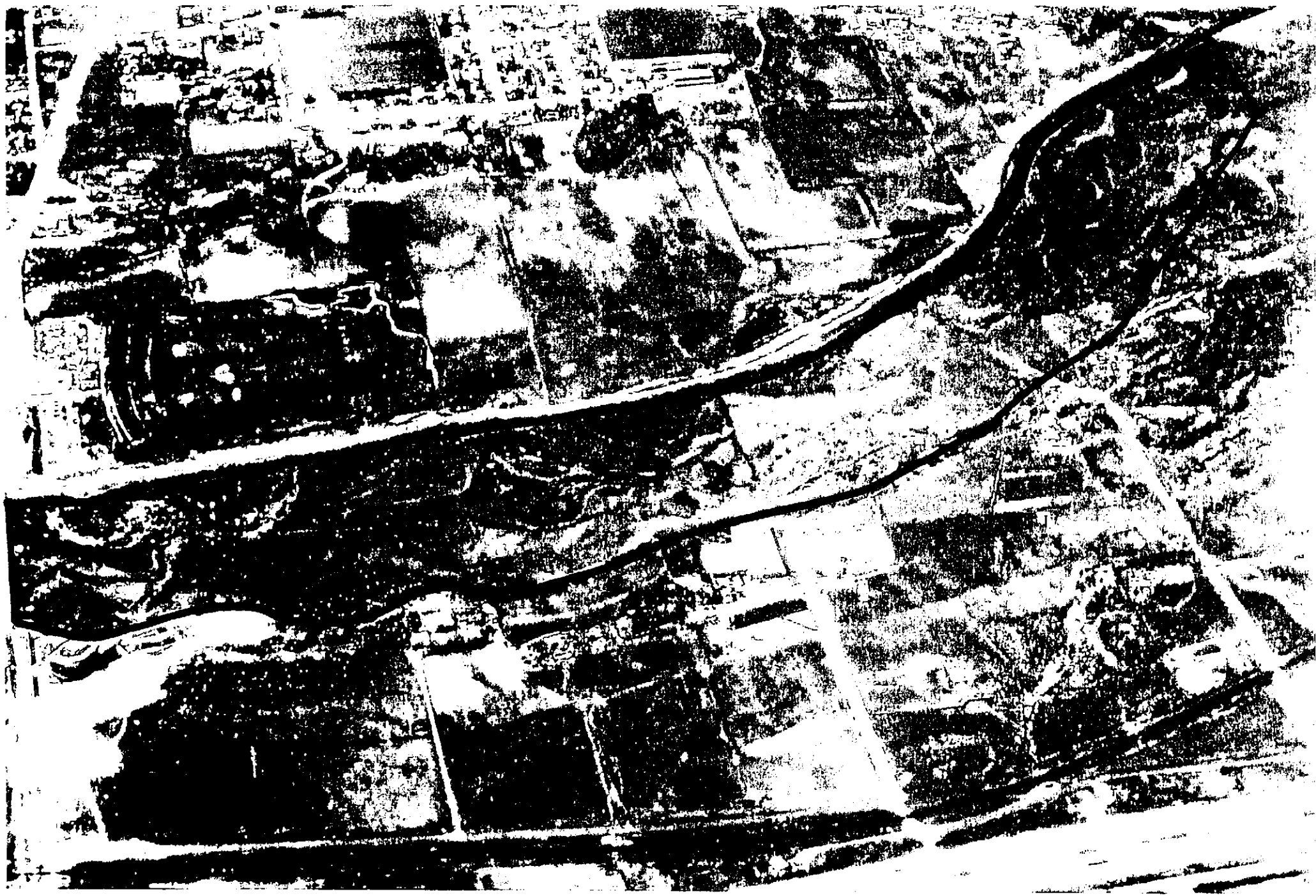
The following goals have been established to provide the framework for achieving the long-term objective of providing habitat to trust resources injured by the release of heavy metals at the Sharon Steel / Midvale Slag Superfund Sites:

- Acquire, through purchase or conservation easement, lands designated within the boundaries of the project area. These lands will be managed as wildlife habitat in perpetuity.
- Eliminate livestock grazing.
- Stabilize the east bank of the Jordan River.
- Modify site hydrology to recreate the old meander channel that parallels the Jordan River.
- Eliminate undesirable plant species and exotic species and replace with desirable native species.
- Significantly increase the density and areal coverage of native shrub and tree complexes supporting neo-tropical migratory bird habitat.

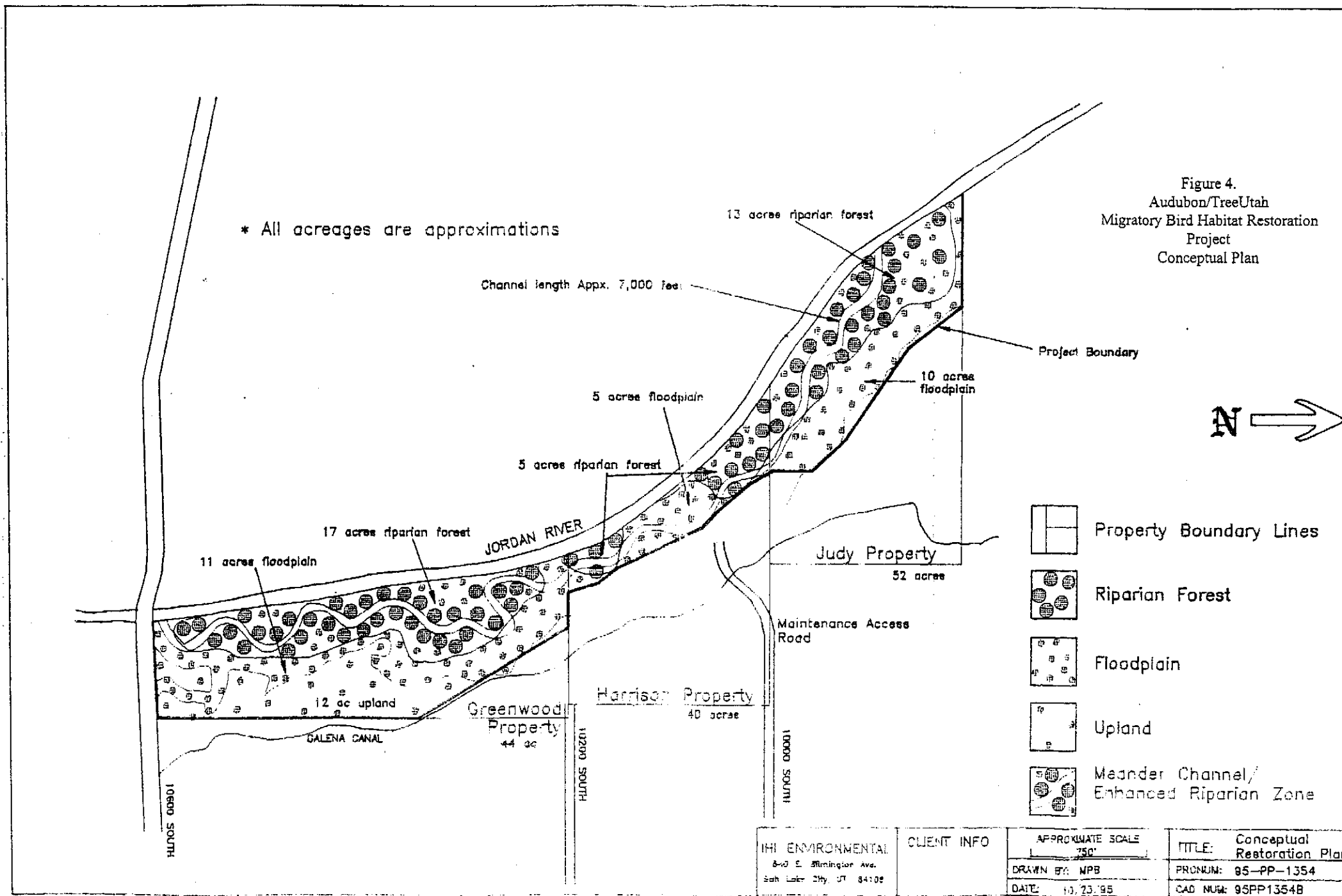
Great Salt Lake Audubon and TreeUtah, the proposal sponsors are working with IHI Environmental in the development and implementation for this part of the Sharon Steel Restoration Plan. The project cooperators, which contribute both in-kind services and money, represent a broad-based consortium of municipalities, non-profit organizations, public agencies, private organizations, and technical consultants (Table 3).

Table 3
Project Cooperators
Audubon/TreeUtah Migratory Bird Habitat Restoration Project

Organization	Role	Representative
Great Salt Lake Audubon	Project Sponsor	Bill Yates,
	Long-Term Management	Keith Johnson
TreeUtah	Project Sponsor	Vaughn Lovejoy
U.S. Fish and Wildlife Service	Project Oversight and Monitoring	Elise Peterson
National Audubon Society	Long-Term Stewardship	Wayne Martinson
Community Representative	Technical Advisor	Ty Harrison, PhD.
Division of Wildlife Resources	Bird Habitat Technical Advisor	Frank Howe, PhD.
IHI Environmental	Project Design and Management	William T. Hopkins
South Jordan City	Long-term Support	Keith Snarr
URMCC (CUP)	Land Acquisition Funding	Catherine Quinn
Salt Lake County	Bank Stabilization with EPA Funds	Steve Jensen
Great Basin Earth Science	Subconsultant	Elliott Lips
University of Utah	Biology Student Volunteers	Fred Montague, PhD.



Photograph 2. Project View Audubon/TreeUtah Migratory Bird Habitat Restoration Project



B. Audubon/TreeUtah Migratory Bird Habitat Restoration Project Budget

The Audubon/TreeUtah Migratory Bird Habitat Restoration Project demonstrates a highly developed partnership including federal, state, nonprofit and private funding sources. The partnering involves the support of a broad base of varied disciplines and jurisdictions working together to achieve the common goal of restoring the Jordan River. It also demonstrates the need and support of the communities who will benefit from this project. The total cost of the project will be \$2,818,599 dollars which includes actual funds and in-kind services, with Sharon Steel Damage Settlement funds contributing \$738,099 (Table 4).

Table 4
Projected Funding Sources
Audubon/TreeUtah Migratory Bird Habitat Restoration Project

Source of Funding	Funds	In-Kind Services	Total Costs
Great Salt Lake Audubon		\$11,000	\$11,000
TreeUtah		\$581,000	\$581,000
SSDS* (U.S. Fish and Wildlife Service)	\$738,099		\$738,099
URMCC (CUP)	\$975,000		\$975,000
EPA	\$324,500		\$175,000
Private Funds		\$15,000	\$15,000
Partners in Flight		\$14,000	\$14,000
IHI Environmental		\$6,000	\$6,000
South Jordan City		\$154,000	\$154,000
Estimated Totals	\$2,037,599	\$781,000	\$2,818,599

*SSDS - Sharon Steel Damage Settlement

3. City of West Jordan Natural Habitat Restoration Project

A. City of West Jordan Natural Habitat Restoration Project

The West Jordan Natural Habitat Restoration project will acquire and restore, in perpetuity, approximately 90 acres of both wetland and upland habitats along the Jordan River floodplain between 9000 South and 8000 South in West Jordan. The project area lies on the west side of the Jordan River directly across the river from the Sharon Steel Superfund site in an area historically used for agriculture. The City of West Jordan is rapidly expanding. Without protection, these lands could be converted to residential and or commercial land uses.

The total project area will be managed specifically for wildlife with emphasis on federally protected trust resources. Public access will be permitted by way of a soft surface, dead end educational trail. If necessary, this trail will be closed during the breeding season to decrease disturbance. The main Provo/Jordan River Parkway Trail will be located on the east side of the river and will not cross the project. The following goals have been established to provide the framework

for achieving the long-term objective of providing habitat to trust resources injured by the release of heavy metals at the Sharon Steel / Midvale Slag Superfund Sites:

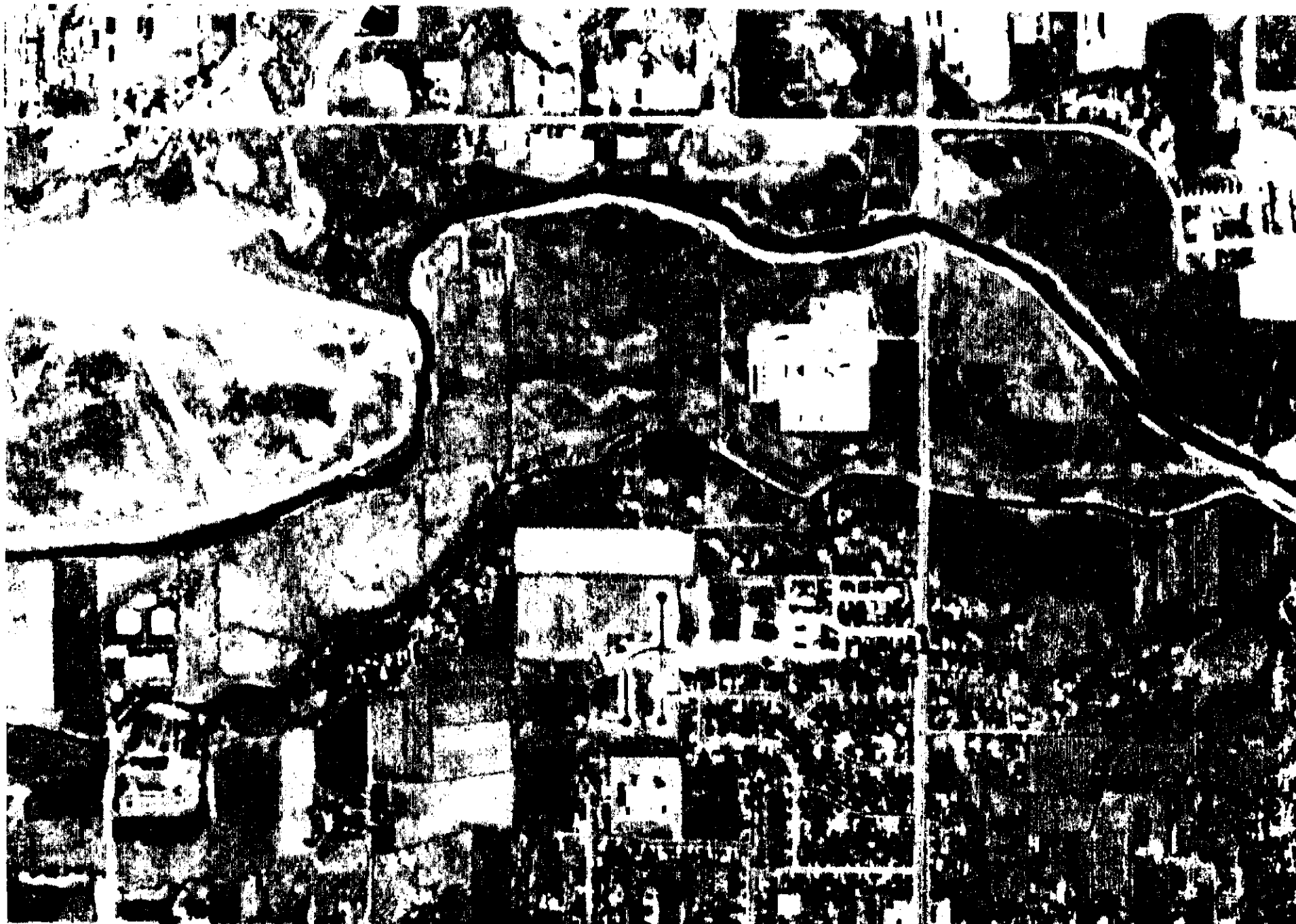
- Acquire, through purchase or conservation easement, lands designated within the boundaries of the project area. These lands will be managed as wildlife habitat in perpetuity.
- Eliminate livestock grazing.
- Stabilize the west bank of the Jordan River.
- Regrade site and modify site hydrology to create or enhance wetland areas with high migratory bird/wildlife habitat value.
- Eliminate undesirable plant species and exotic species and replace with desirable native species.
- Significantly increase the density and areal coverage of native shrub and tree complexes supporting neo-tropical migratory bird habitat.

The City of West Jordan, the proposal sponsor, assembled a project team consisting of Bonneville Research, Swaner Design and TreeUtah to assist in development and implementation for this part of the Sharon Steel Restoration Plan. The project cooperators, which contribute both in-kind services and money, represent a broad-based consortium of municipalities, non-profit organizations, public agencies, private organizations, and technical consultants (Table 5).

Table 5
Project Cooperators
West Jordan Natural Habitat Restoration Project

Organization	Role	Representative
West Jordan	Project Sponsor	Bob Davis
U.S. Fish and Wildlife Service	Project Oversight and Monitoring	Elise Peterson
TreeUtah	Revegetation Support	Vaughn Lovejoy
URMCC (CUP)	Land Acquisition Funding	Catherine Quinn
Trust for Public Lands	Land Acquisition	Jim Davis/Margret Eadington
Salt Lake County	Bank Stabilization with EPA Funds	Steve Jensen
National Audubon Society	Long-term Stewardship	Wayne Martinson
Wasatch Front RC&D*	ID of Potential Funding Sources	David Spann
Utah Power & Light	Land Owner	Jack Peck

*Wasatch Front Resource Conservation & Development



Photograph 3. Project View of West Jordan Natural Habitat Restoration Project

B. City of West Jordan Natural Habitat Restoration Project Budget

The West Jordan Natural Habitat Restoration Project demonstrates a highly developed partnership including federal, state, nonprofit and private funding sources. The partnering involves the support of a broad base of varied disciplines and jurisdictions working together to achieve the common goal of restoring the Jordan River. It also demonstrates the need and support of the communities who will benefit from this project. The total cost of the project will be \$2,207,165 dollars which includes actual funds and in-kind services with Sharon Steel Damage Settlement funds contributing \$746,700 (Table 6).

Table 6
Projected Funding Sources
West Jordan Natural Habitat Restoration Project

Source of Funding	Funds	Total Costs
City of West Jordan	\$109,000	\$109,000
SSDS* (U.S.FWS)	\$746,700	\$746,700
URMCC (CUP)	\$526,800	\$526,800
Salt Lake County/EPA	\$90,000	\$90,000
EPA Brownfields Grant	\$100,000	\$100,000
Salt Lake County (Trail & Bridge)	\$15,000	\$15,000
National Fish and Wildlife Foundation	\$75,000	\$75,000
Trust for Public Lands/Other Private Funds	\$406,665	\$406,665
Division of Parks and Recreation	\$138,000	\$138,000
Estimated Totals	\$2,207,165	\$2,207,165

*SSDS - Sharon Steel Damage Settlement

SCHEDULE AND BUDGET

Total costs breakdowns for individual projects as well as total Sharon Steel Damage Settlement Funds to be provided are in Table 7. Sharon Steel Damage Settlement Funds will be administered under cooperative agreements with the individual project sponsor. A quarterly schedule for disbursement of funds will be part of each cooperative agreement based on project schedules. All restoration projects will be completely constructed within five years. Properties must be secured before significant Sharon Steel Damage Settlement funds can be used on any of the projects. Once land acquisition is secured, detailed plans and designs will be developed and restoration will then proceed according to the funding schedules.

Table 7
Costs and Acres Restored
For Each Restoration Project

Restoration Project	SSDS Funds	Total Funds	Acres to be restored
South Jordan City - Riverway Wildlife Enhancement	\$842,933	\$4,666,683	111
Audubon/TreeUtah - Migratory Bird Habitat Restoration	\$738,099	\$2,818,599	73
City of West Jordan - Natural Habitat Restoration	\$746,700	\$2,207,165	90
Totals	\$2,327,732	\$9,692,447	274

*SSDS - Sharon Steel Damage Settlement

As seen in table 7, significant funds from sources are being coordinated in an effort to restore portions of the highly urbanized Jordan River. These projects represent immense planning, negotiating and vision from many agencies of various jurisdictions as well non-profits, municipalities and private citizens. The Jordan River Valley, much of which has been rural agricultural land is experiencing intense development pressure as the Wasatch Front population continues to swell. This development pressure has caused land prices to increase dramatically in the last 4 years making it impossible to do projects of this size without cooperative efforts such as these. All partners involved play an important role in the success of these projects.

ENVIRONMENTAL COMPLIANCE

The National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 to 4370d, requires that all Federal agencies prepare a detailed statement for major Federal actions significantly affecting the quality of the human environment. There are certain circumstances in which Federal actions do not require the development of a environmental impact statement or an environmental assessment. These categorical exclusions, as related to Fish and Wildlife Service actions, are defined in the Department of Interior Departmental manual (516 DM 6) and were published in the Federal Register on January 16, 1997 (vol. 62, No. 11). In accordance with these implementing procedures, natural resource damage assessment restoration plans, as prepared under section 107, 111, and 122 (j) of CERCLA, are designated as categorical exclusions when only minor or negligible change in the use of the affected areas are planned.

In this restoration plan, no major changes in the use of the affected areas are proposed, therefore a categorical exclusion has been documented through an Environmental Action Memorandum. However, bank stabilization on each of the three projects is being funded by EPA section 319 non-point source pollution funds which, as a Federal action, also required NEPA compliance. Bank stabilization will include resloping the banks of the river to a 4 to 1 slope and planting with native species such as willow and cottonwood. The purpose of the action is to decrease downcutting and erosion within the river channel and ease seasonal flood pressures. The stabilization will take place during low water to allow access to the river banks. To comply with NEPA, an Environmental Assessment was prepared by Salt Lake County who is administering this program, and a Finding of No Significant Impact (FONSI) was issued (Jensen, 1996).

On November 13, 1997 the availability of the draft Sharon Steel Restoration Plan was announced in the Federal Register. A public meeting was held on November 20, 1997 and the public comment period closed on December 15, 1998. One comment letter was received from the State Division of Forestry, Fire

and State Lands (Appendix 1.). All other comments received were editorial in nature and addressed in this document.

REFERENCES

- Brooks, G.R.(ed.). 1989. The southwest expedition of Jedediah S. Smith: His personal account of the journey to California, 1826-1827. University of Nebraska Press, Lincoln, Nebraska. 259pp.
- Bryant, E. 1967. What I saw in California: Being the journal of a tour, by the Emigrant Route and South Pass of the Rocky Mountains, across the continent of North America, the Great Desert Basin, and through California, in the years 1846, 1847. Ross and Haines, Inc., Minneapolis, Minnesota. 468pp.
- Camp Dresser & McKee Inc. (CDM). 1988. Final Draft for Region 8 EPA. Remedial Investigation Report, Sharon Steel/Midvale Tailings RI/FS. June 1.
- _____. 1990 Draft Final, 3 Volumes. Feasibility Study, Sharon Steel/Midvale Tailings Site. Oct. 5.
- CH₂M Hill. 1993. Jordan River stability study. Report submitted to Salt Lake County Public Works, 2001 S. State ST. #N3300, Salt Lake City, Utah.
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or "Superfund"), Public Law P.L. 96-510, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), P.L. 99-499; 42 U.S.C. 9601-9657.
- Dahl, T.E., 1990. Wetlands losses in the United States 1780's to 1980's. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 21 pp.
- Demayo, A., M.C. Taylor, K.W. Taylor, and P.V. Hodson. 1980. Toxic effects of lead and lead compounds on human health, aquatic life, wildlife, plants, and livestock. CRC Critical Reviews in Environmental Control 12:257-305.
- Department of the Interior. 1991. 43 CFR 11, as amended, (March 25, 1994). Natural Resource Damage Assessments; Final Rule. Federal Register 59: 14262- 14288.
- DuBois, K. and Gutermuth, B. 1995. SHARON STEEL DAMAGE SETTLEMENT: A conceptual Restoration Plan. U. S. Fish and Wildlife Service. Salt Lake City, UT. 25 pp.
- Eisler, R. 1988a. Arsenic hazards to fish, wildlife, and invertebrates: a synoptic review. U.S. Fish and Wildlife Service Biological Report 85:1-92.
- Eisler, R. 1988b. Lead hazards to fish, wildlife, and invertebrates: a synoptic review. U.S. Fish and Wildlife Service Biological Report 85/1.14:1-134.
- Hall, R.J. and P.F. Henry. 1992. Assessing effects of pesticides on amphibians and reptiles: status and needs. Herpetological Journal 2:65-71.
- Halpin, M.A. 1987. Jordan River wetland wildlife evaluation. Jordan River Wetland Advanced Identification Study. Utah Division of Wildlife Resources. Salt Lake City, Utah. 60pp.
- Hedges, S.P. 1992. Bird habitats of Utah: the riparian zone. Utah Birds 8(2):21-36.

- Hem, J.D. 1985. Study and interpretation of the chemical characteristics of natural water, Third Edition. U.S. Geological Survey Water-Supply Paper No. 2253. 263pp.
- Howe, F.P. 1993. Population monitoring of Utah neotropical migratory birds in riparian habitats: 1992 Final Progress Report. Utah Division of Wildlife Resources, Salt Lake City, Utah. 14pp.
- Jenkins, Dale W. 1981. Biological Monitoring of Toxic Trace Elements. Environmental Protection Agency Report 600/S3-80-090:1-9.
- Jensen, S.F. 1987. Jordan River wetland advance identification study. Wetland functional assessment interpretive report. Salt Lake City-County Health Dept. Salt Lake City, Utah 93pp.
- Jensen, S.F. 1996. Final Environmental Assessment Jordan River Bank Restoration Project and Finding of No Significant Impacts. Salt Lake City -Board of Salt Lake County Commissioners. Salt Lake City, Ut.42p.
- Leland, H.V. and J.S. Kuwabara. 1985. Chapter 13, Trace Metals. *In* Rand, G.M. and S.R. Petrocelli (eds.), Fundamentals of Aquatic Toxicology. Hemisphere Publishing Company, New York, New York. 666pp.
- Lindsay, D.L. and J.G. Sanders. 1990. Arsenic uptake and transfer in a simplified food chain. Environmental Toxicology and Chemistry 9:391-395.
- Lockerbie, C.W. 1949. Our changing world. (A series of articles published in the Utah Audubon News commencing with the February 1949 issue, Vol. 1, No.2.) Charles W. Lockerbie Papers, Accession Number 992, Box 5. Manuscripts Division, Special Collections, University of Utah Marriott Library, Salt Lake City, Utah.
- Madsen, B.D., ed. 1989. Exploring the Great Salt Lake: the Stansbury Expedition of 1849-50. University of Utah Press, Salt Lake City, Utah. 889pp.
- Rompala, J.M., F.W. Rutosky, and D.J. Putnam. 1984. Concentrations of environmental contaminants from selected waters in Pennsylvania. U.S. Fish and Wildlife Service report. State College, Pennsylvania.
- Simpson, P.W., J. R. Newman, M.A. Keirn, R.M. Matter, and P. A. Guthrie. 1982. Manual of stream channelization impacts on fish and wildlife. U.S. Fish and Wildlife Service Biological Services Program, FWS/OBS-82/84. 155pp.
- Smith, R.B. and C.L. Greenwood. 1984. Jordan River terrestrial wildlife inventory: Proposed Lampton Reservoir area. Bonneville Unit, Central Utah Project. Utah Division of Wildlife Resources. 72pp.
- U.S. Department of the Interior. 1994. Endangered and threatened wildlife and plants. United States Code of Federal Regulations Title 50 Part 17.11 and 17.12. U.S. Government Printing Office Publication 390-789/20165. 42pp.
- U.S. Environmental Protection Agency, 1993. Final Declaration for the Record of Decision For the Sharon Steel (Operable Unit 01) Sharon Steel/Midvale Tailings Site, Midvale Utah.

APPENDIX - Comment Received and Response



State of Utah

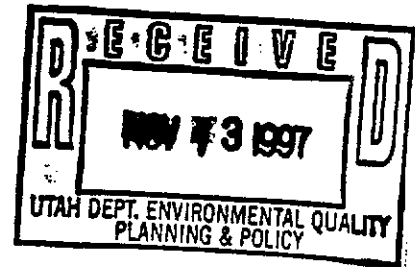
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FORESTRY, FIRE AND STATE LANDS

Michael O. Leavitt
Governor

Ted Stewart
Executive Director

Arthur W. DuFault
State Forester/Director

1594 West North Temple, Suite 3520
Box 145703
Salt Lake City, Utah 84114-5703
801-538-5555
801-533-4111 (Fax)



November 7, 1997

Kathy Grundhauser, Public Relations Specialist
Department of Environmental Quality
168 North 1950 West
P.O. Box 144840
Salt Lake City, Utah 84114-4840

Dear Ms. Grundhauser:

We recently received a copy of the DRAFT Sharon Steel Restoration Plan. Our Division supports the efforts to mitigate and enhance this portion of the Jordan River corridor.

I am sure you are aware that the State of Utah owns the bed of the Jordan River. The proposed project will affect State land. State ownership follows the natural movement of the river as long as it moves naturally. In instances where re-channeling has occurred, however, State ownership generally stays with the abandoned channel. The State may, therefore, not necessarily own the current channel of the river where re-channeling has occurred.

The plan acknowledges in Paragraph 3 of Page 7 that channelizing and dredging has resulted in "now dry" oxbows. In most cases these abandoned oxbows are owned by the State. Any use of State sovereign lands must be approved by our Division. Portions of the Sharon Steel Project which affect land below the ordinary high water mark of the active river channel or abandoned portions which are owned by the State must be coordinated with this division. If permits or easements are required they can be issued to public entities at no cost. Private entities must pay the current rate for such uses, however.

I could find no reference in the DRAFT Plan which acknowledges State ownership of the bed of the Jordan River or that State approval is required for use of such land. The State should be acknowledged as a land owner. Additionally, it should be made clear that approval for use of State land is required. This would provide clarification and help prevent future problems and complications.

Thank you for the opportunity to comment on this document. The document was addressed to Scott Flandro, who has retired, please refer any future correspondence to me at the above address.

Sincerely,

Richard J. Buehler
Wasatch Front Area Manager

Response to written comments from the Division of Forestry, Fire and State Lands

The U.S. Fish and Wildlife Services would like to thank the Division of Forestry, Fire and State Lands for the support of these projects and is aware that some lands within the boundaries of these projects has the potential to be state sovereign lands. One of the proposal ranking criteria listed in the SHARON STEEL DAMAGE SETTLEMENT: A Conceptual Restoration Plan, stated that all proposals must comply with all applicable laws and regulations. Each proposal sponsor, South Jordan, Great Salt Lake Audubon and West Jordan as well as their consultants are aware that some of the lands within their projects may be sovereign lands and as such, would require coordination with the Division of Forestry, Fire and State lands.