Restoration Plan and Environmental Assessment

For Restoring Injuries to Migratory Birds from the
Farmland Industries Oil Spill
Osage County, Oklahoma

Trustee for Natural Resources: Department of the Interior
U.S. Fish and Wildlife Service

Legal Authority: Oil Pollution Act of 1990 (33 U.S.C. 2701, *et seq*., 15 C.F.R. Part 990)

Clean Water Act (33 U.S.C. 1251, *et seq*.)

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 103, *et. seq*.)

Natural Resource Damage Assessment (43 C.F.R. Part 11)

Responsible Federal Agency: U.S. Fish and Wildlife Service, Region 2

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Chapter 1: Introduction

This Restoration Plan and Environmental Assessment (draft RP/EA) is proposed by the Department of the Interior (DOI), represented by the U.S. Fish and Wildlife Service (USFWS), to restore natural resources and trust species, namely migratory birds, from injuries sustained by the July 21, 2001, Farmland Industries oil discharge (hereafter referred to as the Spill) into Cedar Creek, Osage County, Oklahoma.

The USFWS is acting as the lead agency on behalf of the DOI for the injured natural resources. The State of Oklahoma did not participate in the assessment of injuries. However, the USFWS recognizes the State as a co-trustee for natural resources and environmental services injured and lost.

1.1 Purpose and Need

The purpose of this RP/EA is to promote expeditious and cost-effective restoration for injured natural resources and to compensate the public for the loss of trust resource services caused by the Spill. The Oil Pollution Act of 1990 (OPA) provides a Natural Resource Damage Assessment and Restoration (NRDAR) process for developing a restoration plan and pursuing implementation of restoration, through funding, by the responsible parties. The assessment guidelines also provide an administrative process for involving interested parties in selecting restoration actions from a reasonable range of alternatives (15 C.F.R. 990.10). The need is to reduce or eliminate the loss of public resources caused by the unauthorized releases.

1.2 Authority

The RP/EA was prepared by the USFWS pursuant to its authority and responsibilities as natural resource trustees under the OPA (33 U.S.C. 2701, *et seq*.), the Federal Water Pollution Control Act, 33 U.S.C. § 1251, *et seq.* (also known as the Clean Water Act or CWA) and other applicable federal and state laws, including Subpart G of the National Oil and Hazardous Substances Contingency Plan (NCP), 40 C.F.R. §§ 300.600 through 300.615. The OPA, through its NRDAR provisions, provides for the designation of a federal, state (on behalf of the public), or Indian tribe to act as trustees for natural resources (15 C.F.R. 990.11). The damages recovered from parties responsible for the natural resource injuries are used to restore, rehabilitate, replace, and/or acquire the equivalent of those trust natural resources injured (collectively "restoration"). The trust resources for the DOI, USFWS, include but are not limited to, migratory birds and federally-listed threatened and endangered species and their habitats.

1.3 Background

On July 23, 2001, a break in a gravity-fed oil pipe[1] owned by Farmland Industries

[1] Location: N 36.78169° W 096.11749°

(Farmland) resulted in the discharge of oil into an unnamed intermittent creek; a tributary of Cedar Creek, Osage County, Oklahoma (referred to as the Site). Approximately 2,000 gallons of oil were discharged into the unnamed tributary of Cedar Creek causing injury to trust natural resources, including migratory birds.

1.4 Settlement of Natural Resource Claim

In December 2003, Farmland Industries filed for bankruptcy. The DOI filed a claim for damages to gain restoration funds to compensate for natural resource injuries from the spill. The USFWS estimated the claim damages to trust natural resources using the Habitat Equivalency Analysis (HEA) method, which utilizes a process for valuing natural resource damages outlined in the NRDAR regulations implementing the OPA (15 C.F.R. Part 990). The USFWS determined, through the HEA model, that the public could be compensated for the injuries to migratory birds and the impacted stream and stream banks by the creation of 30 acre/years of replacement habitat. The DOI reached a negotiated settlement with Farmland in April 2005 and damages were allocated for restoration purposes and past assessment costs (U.S. Bankruptcy Court 2005).

Chapter 2: Natural Resources and Services Affected by the Spill

This section of the document addresses the natural resources affected by the Spill and those in the project areas where restoration will take place.

2.1 Affected Biological Resources

Habitat

The Spill occurred in the Cross Timbers ecological sub-region of northeastern Oklahoma. The vegetation in this area mainly consists of post oak/blackjack oak forests along the creek banks with fragmentary areas of tallgrass prairie. The geologic stratum consists of Pennsylvanian marine deposits including sandstone, shale, coal, and limestone (McNab and Avers 1994). This habitat is used as a nesting and foraging stop for migratory birds using the Central Flyway migratory route.

Migratory Birds

A pool of water adjacent to the unnamed creek was being used by wildlife and was the only source of water in the immediate area, due to unusually dry conditions at the time of the Spill. Oil migrated upstream into the pool, due to strong winds, and formed oil sheens over the surface. The USFWS confirmed several wildlife species using this pool of water, including an eastern kingbird (*Tyrannus tyrannus*), which was seen nesting adjacent to the stream and using the stream environment as a source for prey. USFWS also found several fish and aquatic invertebrates floating dead in the water or along the stream banks. The dispersion of the oil into the water column injured the aquatic resources that are utilized by migratory birds at the Site.

Petroleum oil, as a contaminant, can take several pathways when affecting bird species. Direct effects of oil to migratory birds include: 1) the ingestion of oil while attempting to clean oiled feathers, 2) mortality of eggs as oil is transferred from adults to embryos and 3) reduced reproduction due to the ingestion of oil. Indirect effects of oil on migratory birds can occur by decreasing the availability of prey organisms. Changes in the condition of migratory bird habitat may lead individual birds to move elsewhere, influencing habitat occupancy and use (Parnell *et al.* 1998).

2.2 Water Resources

The discharged oil flowed into the unnamed intermittent creek bed and subsequently flowed approximately 1,000 feet to Cedar Creek (an intermittent stream) and then flowed approximately 2 miles to Buck Creek (a perennial stream). The potential pathway of discharged oil, should it have continued downstream another 2 miles from Buck Creek to Sand Creek (a perennial creek) and then another 5 to 6 miles into the Caney River, would have threatened this navigable-in-fact body of water.

The USFWS calculated the actual extent of habitat affected by the discharge as approximately 15 miles of streams and adjacent banks along Cedar Creek, from the point of discharge to the confluence of Cedar and Buck creeks.

2.3 Environmental Services

The reduction in biomass and diversity of aquatic biota from the affected creeks at the Site has potentially affected other state wildlife species of concern in the area as well as migratory birds. The loss of insects, a food source, is considered a potential threat to the above mentioned species. The potential loss of these species would indicate an interruption in ecological service flows (e.g. those services that the habitat offers to wildlife) for the area. Other environmental services provided by a functional, healthy migratory bird habitat (i.e. biodiversity, aesthetics) were also reduced by the Spill and result in a deficit to the public.

Chapter 3: Restoration Alternatives

The guidelines require that the Trustee develop a reasonable number of possible alternatives for restoration. The selected restoration alternative must be consistent with statutory mandates and regulatory procedures that indicate that recovered damages are used only for the restoration of the natural resources injured, destroyed, or lost as a result of contamination from the discharge and costs to the agency.

3.1 Restoration Goals and Objectives

Under OPA, the goal of restoration projects is to make the public and environment whole for injuries to natural resources and their services resulting from oil spills.

The term “restoration” is defined in the NRDAR regulations as “…actions undertaken to

return an injured resource to its baseline condition, as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided…"(43 C.F.R. § 11.14(ll)). Under the assessment regulations (40 C.F.R. § 11.82), the natural resource Trustee should consider the following factors when evaluating and selecting among possible alternatives to restore or replace injured natural resources:

- Technical feasibility;
- The relationship of the costs of the proposed alternatives to the expected benefits from the restoration;
- Cost-effective planning and alternatives;
- The results of actual or planned response actions;
- The potential for additional injury resulting from the proposed actions;
- The natural recovery period;
- Ability of the resources to recover with or without alternative actions;
- Potential effects of the action on human health and safety;
- Consistency with relevant federal, state, and tribal policies; and
- Compliance with applicable federal, state, and tribal laws.

3.2 Alternatives Eliminated from Further Analysis

While on-site restoration is a first choice for any restoration project, remediation actions on-site were not fully accomplished leaving the Site to naturally attenuate. Since restoration funds can only be used for restoration, not remediation, only off-site projects will be considered because they have the ability to restore comparable natural resources to compensate the public for losses sustained while the remaining oil is remediated through natural processes over time. Therefore, on-site restoration is not a viable restoration alternative.

3.3 Alternatives Carried Forward for Detailed Analysis

Since damages were specifically recovered for the restoration of natural resources injured by the Spill, it is necessary to use them for actions that restore those types of resources that were impacted by the Spill. In addition, restoration should occur as close to the Site as possible to provide restoration to natural resources comparable to those injured on-Site. Therefore, all the proposed restoration projects occur in Osage County.

In accordance with the assessment and National Environmental Policy Act (NEPA) regulations, the Trustee considered a reasonable range of restoration alternatives before selecting the preferred alternative. The alternatives considered are categorized as:

- Alternative A: No Action/Natural Recovery;
- Alternative B: Acquisition and Enhancement of Upland Migratory Bird Habitat;
- Alternative C: Off-Site Streambank Stabilization; Preferred alternative
- Alternative D: Off-Site Wetland Restoration/Enhancement; and
- Alternative E: Construct Off-Site Outdoor Classroom.

The descriptions below provide a general synopsis of types of activities appropriate for fund expenditure, followed by general descriptions of potential impacts from those activities. Should actual projects identified have impacts greater than those identified within this document, additional documentation of those actions and impacts will be provided for public review prior to implementation.

3.3.1 Alternative A: No Action/Natural Recovery

Under this alternative, no restoration actions (including rehabilitation or replacement) would be taken to compensate for the loss of natural resources and services. This alternative would take no further action to restore the natural resources and services at the Site, including those resources lost during the natural recovery period. In contrast, the other alternatives discussed below describe tangible benefits to trust natural resources.

3.3.2 Alternative B: Acquisition and Enhancement of Upland Migratory Bird Habitat

The migratory birds impacted by the Spill use upland riverine habitat during migration. Upland habitats, such as the Cross Timbers and the tallgrass prairie, are areas currently in need of protection from development and/or degradation. Acquiring and enhancing existing areas of upland habitat is therefore a form of restoration appropriate to compensate for injuries at the Site. Possible properties would be purchased from willing sellers or become part of an easement agreement and managed for wildlife uses. Forms of enhancement for the upland habitat may include: fencing to protect from grazing, removal of invasive or exotic species, tilling and replacing with native vegetation, and/or prescribed burning to assist in species control, added nutrient content to the soil, and promotion of native grasses. Possible land managers for land acquisitions include the Oklahoma Department of Wildlife Conservation, the USFWS, The Nature Conservancy (TNC), and other organizations.

3.3.3 Alternative C: Off-Site Streambank Stabilization – Preferred Alternative

In the 1960s, cement culverts were constructed on county roads in Osage County for drainage purposes. These culverts allowed for an increase in volume of water flow into the streams of the Tallgrass Prairie Preserve (Preserve), owned and operated by TNC, and subsequently are creating erosion headcuts, or downcut channels. As the headcuts deepen the channel, higher streamflow volumes stay within the confines of the gully rather than dissipating onto the floodplain. These gullies lower water tables and cause drying of the prairie which changes vegetation composition and water-storing abilities (US FS 2005).

The TNC is working on a large-scale project to alleviate the headcuts on the Preserve through on-going streambank stabilization projects; however, projects only occur as funding allows. Restoration activities for this alternative will occur on a portion of one of the eroding streams and include re-shaping the headcuts and the streambank edges to

stabilize the soil. The stream hydrology and surrounding banks will be re-contoured through leveling to slow and modify streamflow. These activities will enhance stream habitat by reducing erosional pressure on the banks of the stream, allowing for the proper deposition of sediments in the stream, and reducing turbidity. Stabilization and enhancement activities will include the removal of invasive species, leaving slash on soil surface, seeding with appropriate tallgrass species (to maximize retention), and applying compost mats or sod in areas where topsoil has been removed.

The Preserve is the largest protected remnant of tallgrass prairie remaining in the Northern Hemisphere. Originally spanning 14 states from Texas to Minnesota, urban sprawl and conversion to cropland have left less than 10% of this landscape intact (TNC 2004). One major consequence of these habitat changes has been a significant increase in the degree of fragmentation of remaining grassland habitats. These increasingly fragmented grasslands reduce both the occurrence and density of breeding birds. (Herkert *et al.* 2003). This alternative will restore the functionality of the tallgrass prairie ecosystem which, in turn, will function as beneficial migratory bird habitat.

3.3.4 Alternative D: Off-Site Wetland Restoration/Enhancement for Migratory Bird Habitat

Wetlands are important features in the landscape and provide many ecosystem functions: habitat for fish and wildlife, improving water quality, reducing flood risks, recharging ground water, aesthetics, and creating recreational opportunities. Wetlands are also some of the most biologically productive and diverse natural ecosystems in the world and up to one-half of North American bird species nest or forage in wetlands (EPA 2001).

The potential project under this alternative would restore/enhance wetland habitat for use by migrating, wintering, and resident birds for breeding, foraging, and nesting. The proposed project would entail the creation of a water control structure that will allow for the formation of a shallow wetland, not only for migratory bird use but other wildlife in the area as well. Potential restoration activities for this project would include the creation of an earthen dike with a water control structure that could provide predictable, fluctuating hydrology similar to other wetlands in the area of the Spill, earthmoving activities for the wetland development, re-introducing wetland plants to the area, and closely monitoring for unforeseen circumstances. Best management practices (BMPs) for this project include:

- Planning and consideration of the wetland in relation to the surrounding watershed to manage appropriately;
- Creating a water control structure that maintains stable wetland hydrology;
- Emphasizing the re-introduction of native wetland plant species, taking into consideration that natural forces will assist in the ultimate wetland design by choosing the most appropriate species (Mitsch and Wilson 1996); and
- Limit construction equipment access into the wetland as much as possible to lessen ground disturbances.

3.3.5 Alternative E: Construct Off-Site Outdoor Classroom and other Educational Activities

Education and public awareness is an essential part of any restoration project. Allowing the public access to migratory bird habitat will enhance understanding of the need for habitat conservation and prevention of injuries to these natural resources in the future.

This potential alternative involves the construction of an outdoor classroom and other activities for educational purposes. The proposed project would include the creation of interpretive trails for wildlife viewing/access points, construction of bird blinds to enhance viewing opportunities, construction of boardwalks (over a limited area) to allow better access and viewing over the habitat, and/or the construction of interpretive signs that show the detailed life histories and behaviors of migratory birds that utilize the area. The BMPs for this project include limiting construction equipment to minimize soil compaction and erosion and awareness of seasonal time frames for construction so as to not disturb breeding or nesting species.

3.4 Summary of Potential Restoration Alternatives

Table 1 outlines the specific proposed projects with the ability to restore natural resources lost or injured at the Site, and/or to provide additional resource services to compensate the public for the interim losses.

Table 1. Potential Restoration Alternatives

Alternatives	Project Description
No Action/Natural Recovery	Allow natural processes to occur at the Site without restoration or enhancement
Acquisition and Enhancement of Migratory Bird Habitat	Acquisition and protection of upland habitat used by migratory birds
Off-Site Streambank Stabilization – Preferred Alternative	Restoration of Tallgrass Prairie Preserve by contouring the streambanks, preventing gully erosion
Off-Site Wetland Restoration/Enhancement	Creation of an water control structure, re-vegetate with wetland plants, monitor
Construct an Outdoor Classroom	Construct interpretive trails and signs for educational/recreational purposes

Chapter 4: Environment Affected by Restoration Alternatives

All of the proposed actions would occur in Osage County, which is located in northeastern Oklahoma. The following analysis concentrates on this geographic area.

4.1 Physical Characteristics of Osage County

Osage County is comprised of the Flint Hills, Osage Plains, and Cross Timbers sub-regions. The Flint Hills and Osage Plains were dominated historically by tallgrass

prairie, with scattered groves of oaks along the uplands and the drainages. The Cross Timbers sub-region is a complex mosaic of upland forest, savanna, and glades which form the broad eco-tone between the eastern deciduous forests and the grasslands of the Central Plains (Stahle *et al.* 2003). A variety of wetland types, including wet prairie, marshes, and northern floodplain forests occur along the larger rivers in this area.

Grassland-type habitats within the Flint Hills area are managed almost exclusively for beef production. Under this management regime, annual burns and grazing practices provide little of the habitat structure to support many priority migratory bird species. Fire suppression, overgrazing, and the spread of exotic plants are also other factors that most negatively affect migrant bird habitat (Fitzgerald *et al.* 2000). The extensive oak woodlands of the Cross Timbers are also becoming increasingly fragmented, but the remnants provide vital habitat for neo-tropical migrant birds and other native flora and fauna (Stahle *et al.* 2003).

4.2 Land Use

The most important anthropogenic land uses in the tallgrass prairie and Cross Timbers regions are farming, ranching and low-density urbanization. These activities can have large-scale effects on wildlife in this region through habitat degradation. The conversion to cropland decreases species diversity and lowers reproductive success far below what is necessary to maintain stable populations. The homogeneity that follows intensive grazing and intensive annual burns results in little structural diversity for the different habitats that each wildlife species relies upon (Fitzgerald *et al.* 2000).

4.3 Biological Environment

Habitat/Vegetation

The Cross Timbers are dominated by Post Oak (*Quercus stellata*) and Blackjack Oak (*Quercus marilandica*); these two oaks may comprise 90% of the canopy cover. These woodlands were not ideal for lumber production so some of the original oaks still stand where farming was infeasible. There are some post oaks that are 200 – 400 years old (The University of Arkansas 2006). Eastern redcedars (*Juniperus virginiana)* over 500 years old can also be found along on fire-protected bufferlines (The University of Arkansas 2006). This invasive tree, once suppressed by natural fire regimes, is currently out-competing native plants. The resulting bare soils and increased erosion severely impacts the plant and animal communities in the region (TNC – Eastern Redcedar 2004).

The tallgrass prairie is dominated by four common, grass species: Big Bluestem (*Andropogon gerardi*), Little Bluestem (*Schizachyrium scoparium*), Indian Grass (*Sorghastrum nutans*), and Switchgrass (*Panicum virgatum*) and is characterized by a mosaic of upland deciduous forests, savannah, and prairie communities (ODWC 2005).

Migratory Bird Species

In general, declines in the numbers of migratory birds have been detected over the past several decades. There are two main causes of decline which cause severe threats to migratory bird survival: 1) fragmentation and degradation of breeding habitat and 2) destruction of habitats on wintering grounds (Deinlein Fact Sheet No. 6).

Examples of migratory birds with declining populations known to inhabit the region include great blue heron, red-tailed hawk, and eastern kingbird. The USFWS has also recommended that conservation attention be focused toward the following migratory bird species which have experienced population declines in the tallgrass prairie and Cross Timbers regions: Interior Least Tern (*Sterna antillarum* –federally-listed endangered species), and Piping Plover (*Charadrius melodus* – federally-listed threatened species) (USFWS 1992).

Other Wildlife Species

The American Burying Beetle (ABB) (*Nicrophorus americanus*), a federally-listed endangered species since 1989, is nocturnal, has a life span of about one year, and is a habitat generalist. The ABB once occurred throughout the eastern U.S. but now is restricted to less than ten percent of its historic range ((USFWS 2005). However, recent surveys done by the USFWS indicate small populations of ABBs inhabiting Osage County, Oklahoma.

4.4 Cultural Resources

The Osage Indian Reservation (coterminous with Osage County) is home to the Osage Nation. The Osage Indians settled in the rich woodlands of northeastern Oklahoma around 1796. When a band of Cherokees settled near the Osage, territorial violence erupted between the two tribes. The U.S. negotiated a truce to drop all damage claims if the Osage ceded 7 million acres of land to the federal government. The Osage continued attacking, however, and were finally forced to cede the rest of their lands to the United States in 1825. In 1870, Congress sold the rest of the Osage lands, turned the money over to the tribe and opened a reservation for them which later became Osage County. The Osage prospered on their reservation lands and substantial oil reserves were discovered in the early 1900s making the Osage the wealthiest people per capita in the United States at that time (State of Oklahoma 2004).

The tallgrass prairie and Cross Timbers ecosystems found in Osage County provide a multitude of flora and fauna that the Osage tribal clans recognize as culturally significant. As the Osage Nation owns all the mineral resources in Osage County, including soil, sand, and gravel, any of the alternatives calling for ground disturbance activities will be coordinated with the Osage Tribe to determine whether permits or licenses are required as well as consultations with the State Historic Preservation Office to prevent adverse

impacts from occurring to Osage cultural resources. The USFWS will also consult with the Bureau of Indian Affairs (BIA) if the selected alternative involves any land acquisition or easements where the land is restricted or held in trust.

4.5 Local Socioeconomic Conditions

As of the census in 2000, the estimated total human population for Osage County in 2005 was 45,416 with its county seat being in Pawhuska. There were 16,617 households and 12,213 families living in Osage County. (U.S. Census Bureau 2006).

There are many special socioeconomic resources that occur within Osage County. The Preserve, an approximately 38,500-acre area, was established to promote conservation and protection of a once vast tallgrass prairie ecosystem. The Preserve is open to the public and is an example of what this region looked like historically. The Osage Wildlife Management Area, approximately 9,500 acres east of the Preserve, provides many opportunities for the public to hunt, fish, and camp. Several other important recreational resources occur in Osage County and are important to the public for many recreational activities.

Chapter 5: Environmental Consequences

Each alternative has been examined for potential impacts on biological resources, such as migratory birds and associated habitat, federally-listed threatened and endangered species and associated habitats. Socioeconomic impacts focus on effects related to public accessibility, location of proposed alternative, surrounding infrastructure from restoration activities, and changing of property from private to public ownership. Other potential impacts resulting from the alternatives are discussed in Table 2.

5.1 Alternative A: No Action/Natural Recovery

Under this alternative, no direct action(s) would be taken to restore injured natural resources or compensate for lost services on or off-Site. Instead, full recovery of the injured natural resources to baseline conditions would rely on natural processes. There also would be no improvements to compensate the public for the interim service loss resulting from the discharge. Furthermore, no environmental benefits would be realized from the allocated damages and the Trustee would not be fulfilling their obligations as a natural resource trustee. While implementation of this alternative would have no project impacts, failure to restore injured resources is not acceptable to the Trustee.

5.2 Alternative B: Acquisition and Enhancement of Upland Migratory Bird Habitat

This alternative would protect migratory birds and their upland habitat similar to that injured from the Spill. Fragmentation of habitat is one of the leading causes of wildlife population declines and scientific literature suggests that bird densities and species diversity are higher in larger, rather than smaller, fragments of suitable habitat (Herkert 1994). The acquired property will provide beneficial impacts by providing more

adequate habitat for breeding and nesting of migratory birds and other wildlife species and result in less competition between individuals and between species, which increases survival and diversity.

This alternative was evaluated regarding impacts to biological resources, specifically fish and wildlife species listed under the Endangered Species Act (ESA) and Migratory Bird Treaty Act (MBTA) and is common to all the following alternatives. Because the proposed restoration activities coincide within the same county as documented populations of the ABB, surveys will need to be done before any restoration activities can be implemented to ensure that the restoration actions will not jeopardize the continued existence of the ABB. If ABBs are located in the restoration area, upon consultation with the USFWS, significant impacts may be avoided by removing the species from the project area by using protocols set forth in the USFWS conservation approach for the species (USFWS 2005).

The implementation of this alternative presents no significant impacts to the environment because the types of enhancement activities will not cause major ground disturbance. Minimal impacts may exist including the potential for erosion between removal of invasive species and the re-colonization of native species, and a potential hazard from prescribed burning (i.e. excess smoke limiting visibility) and herbicide use if not administered properly. With the implementation of BMPs, these impacts will be temporary and will not present any significant long-term adverse impacts to the environment.

Implementation of this alternative may result in negative socioeconomic impacts as preserved habitat is no longer available for future land development. However, because the added acreage would be small, the negative impacts from loss of economically productive land will be short-term and not significant.

5.3 Alternative C: Off-Site Streambank Stabilization – Preferred Alternative

Implementing this alternative would ultimately result in the increased functionality of the tallgrass prairie riparian ecosystem. This alternative would provide habitat for migratory birds during migration and nesting as well as improving the water quality associated with the restored riparian areas.

Short-term physical disturbances on water and soil resources will occur under this alternative due to the need to manipulate the soils and riparian habitat for restoration purposes. The surface water and soil quality will be negatively impacted if sediments enter into the streams from surface runoff and especially if there is a lack of vegetation and root systems to stabilize soil. Increased soil compaction caused by construction vehicles may also negatively impact the surrounding area. Best management practices can provide measures to lessen the impacts of these physical disturbances to short-term and non-significant.

Surface runoff can be minimized by designing streamside management zones (SMZs)

that are consistent with the stream characteristics and wide enough to protect water quality. Silt fencing to reduce turbidity in streams, re-vegetation to increase soil stability and reduce erosion, and timing to avoid nesting habitat degradation are ways to mitigate the impacts of the disturbances so they are minor and pose no significant impacts to the environment.

The Preserve is an important fixture for the communities in the area and community involvement is vital. Enhancement of the Preserve provides beneficial impacts by creating additional opportunities for the public to view and experience wildlife in the area. This positively impacts the region by promoting more recreational activities for the public. However, during construction activities, there is the possibility of increased noise and dust on the Preserve, and turbidity when fishing downstream. These impacts will exist during construction, and with use of BMPs, will be short-term and will not significantly impact the environment.

This restoration alternative is part of a larger streambank stabilization effort enacted by TNC to restore the Preserve's riparian system. Future restoration actions taken by TNC will be in-kind to the restoration actions of this alternative and will take similar precautionary actions to minimize significant impacts to the environment.

This is the Trustee's preferred alternative. This alternative has a high probability of success and is technologically and economically feasible. Although the other alternatives also have the ability to restore natural resources, it is Alternative C that does so by most closely aligning with resources impacted by the Spill. The Trustee believes that the actions implemented with this alternative have the potential to restore the selected location to its highest natural resource value and function resulting in long-term habitat benefits for migratory birds, other wildlife, and the public.

5.4 Alternative D: Off-Site Wetland Restoration/Enhancement for Migratory Bird Habitat

The creation of an artificial wetland will provide a multitude of ecosystem functions (i.e. habitat during migration and nesting) for migratory birds and other wildlife that are not currently in place at the selected location. Since wetland acres are on the decline in the United States, this alternative would provide necessary habitat to wetland dependent wildlife species.

Short-term physical disturbances will occur due to the need to construct a water control structure for the artificial wetland and any earthmoving activities to contour the wetland's bottom and borders. These disturbances include removal of existing vegetation, construction of the water structure, compaction of soil for roadway, increased noise and emissions from the construction vehicles, and increased possibility for erosion and surface runoff with construction activities.

The construction activities may initially impact wildlife species in the area by increasing noise and emissions from vehicles, presence of workers, and disturbing existing habitat.

To minimize these impacts, the Trustee will implement restrictions on construction for parts of the year, reduce the number of construction vehicles allowed at the project site, and use hay bales or silt fences to prevent runoff. Other BMPs may be instituted as appropriate to lower additional potential for negative impacts.

This alternative provides beneficial socioeconomic impacts by creating the opportunity for people from the surrounding communities in the county to visit the wetland for wildlife viewing, hiking, and other recreational activities.

5.5 Alternative E: Construct Off-Site Outdoor Classroom and Other Educational Activities

This alternative compensates the public for lost use of the resource services through the creation of educational interpretive trails and wildlife viewing access points. Promoting conservation activities through educational programs allows for an increased awareness of wildlife behaviors and conservation activities. This alternative will allow the public to learn more about the natural resources and services that were affected by the Spill and will promote future understanding of habitat conservation.

Minor impacts to the habitat from construction activities may include the removal of vegetation for trails and potential erosion during construction of the trails and viewing/access points. The Trustee will use BMPs to assure impacts from these actions are minor and will not present significant impacts to the environment.

5.6 Cumulative Impacts

Each of the proposed alternatives, with the exception of the No Action/Natural Recovery alternative, addresses the protection of migratory birds and/or the creation of their supporting habitats. Although restoration actions for the alternatives will not equivocally replace specific natural resources injured from the Spill, the Trustee believes that the restoration projects will provide comparable services for the trust natural resources that were lost or injured. Projects in this restoration plan not only benefit migratory birds and other wildlife species which use these habitats, they also compensate the public for lost resource services.

5.7 Summary of Environmental Impacts by Alternative

The following is a table that summarizes the consequences from implementing each alternative. The Trustee has used this analysis to aid in the selection of the preferred alternative.

Table 5.7 Summary of Environmental Consequences by Alternative

Attributes	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Upland Migratory Bird Habitat	Natural recovery over long-term	Increase in upland habitat	Increase in upland habitat	Increase in upland habitat	Does not restore upland habitat
Aquatic Habitat	Continued loss of habitat	Protects aquatic habitat where present	Restores tallgrass riparian systems	Increases wetland habitat and acts as a buffer strip for streams	Conservation of aquatic habitat through education
Fish Resources	Potential continued injury to fish species	Protects current populations from degradation	Positive: will protect in long-term Negative: minor impacts during restoration activities	Increase in populations	Protection of fish resources through education
Wildlife Resources (i.e. migratory birds)	Continued injury to migratory birds and other wildlife	Increase in populations	Increase in populations	Increase in populations	Protection of wildlife resources through education
Threatened and Endangered species	Negative impacts would continue if species are present	Protection of ABB through survey & removal protocol	Protection of ABB through survey & removal protocol	Protection of ABB through survey & removal protocol	Protection of ABB through survey & removal protocol
Cultural Resources	Adverse impacts may potentially occur	Protection of resources	Protection of resources	Protection of resources	Protection of resources
Surface water	Remains degraded due to residual oil	Increase in water quality	Increase in water quality	Increase in water quality associated with wetlands	Conservation of surface water through education
Socioeconomic Issues	Not applicable	Positive: increase in local economy due to increased recreational opportunities Negative: may remove option for land development	Increase in local economy due to increased recreational opportunities	Increase in local economy due to increased recreational opportunities	Increases public awareness about oil spills and conservation of migratory birds and their habitats
Recreational Uses	No enhancement or increase of recreational opportunities or facilities	Enhancement or increase in recreational opportunities	Enhancement or increase in recreational opportunities	Enhancement or increase in recreational opportunities	Enhancement or increase in recreational opportunities
Cumulative Impacts	Does not restore migratory bird populations or their supporting habitat	Protection and/or enhancement for migratory birds & their supporting ecosystems	Protection and/or enhancement for migratory birds & their supporting ecosystems	Protection and/or enhancement for migratory birds & their supporting ecosystems	Protection and/or enhancement for migratory birds and to public for lost use

5.8 Coordination with the Public

Public review is an important component of the restoration planning process. The Trustee provided the public with the opportunity to comment for a 30-day period. Comments received by the due date will be considered part of the official record and will be incorporated into the final restoration plan and environmental assessment. The draft RP/EA was advertised in the Tulsa World and the Pawhuska Journal-Capital newspapers and is available on the USFWS website at:
http://www.fws.gov/southwest/es/oklahoma/envqual.htm/Farmland_RP-EA_4_05_07.pdf

Copies can also be requested from the USFWS at:

U.S. Fish and Wildlife Service
9014 E. 21st Street
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Chapter 6: Public Comments on the draft Restoration Plan/Environmental Assessment

The draft RP/EA was available for public review and comment for 30 days. The availability of comments was advertised in local news media and via the internet. The public was invited to submit comments in writing or via the website through the closing of the review period on June 8, 2007.

No public comments were received regarding this draft RP/EA. Therefore, the document will be finalized and made available on the USFWS internet site at:
http://ifw2es.fws.gov/Oklahoma/xxxxxxxxx. The selected restoration alternative will be implemented when the USFWS Southwest Regional Director authorizes the final RP/EA.

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