JOINT ENVIRONMENTAL ASSESSMENT AND RESTORATION PLAN FOR THE FISH CREEK #2 DIESEL FUEL SPILL

TRUSTEES

U.S. Department of the Interior
Fish and Wildlife Service (FWS)

State of Indiana
Indiana Department of Environmental Management (IDEM)
Indiana Department of Natural Resources (IDNR)

State of Ohio
Ohio Environmental Protection Agency (OEPA)
in consultation with
Ohio Department of Natural Resources (ODNR)

February 24, 1997

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LEGAL AUTHORITY:

Oil Pollution Act of 1990, 33 U.S.C. § 2701 et seq.

Natural Resource Damage Assessments, 43 Code of Federal Regulations, Part 11

LOCATION:

Dekalb County, Indiana and Williams County, Ohio

CONTACT:

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DATE:

February 24, 1997

ABSTRACT: On September 15, 1993, a pipeline owned by NORCO, Inc., and formerly owned and operated by ARCO, Inc. ruptured, discharging an estimated 676 barrels (30,000 gallons) of #2 diesel fuel into a crop field in DeKalb County, Indiana. The diesel fuel made its way into a small drainage ditch that discharges to Fish Creek. This oil entered Fish Creek and spread downstream, crossing into Williams County, Ohio, exposing the lower 7 miles of the creek to the diesel fuel contamination. As a result, numerous federal and state natural resources have been and may continue to be injured. Mortality of mammals, migratory birds, fish, reptiles, amphibians, and mussels was observed from the spill plume area of Fish Creek following the discharge. Claims for natural resource damages were settled by consent decree under the Oil Pollution Act (OPA) § 1006, 33 U.S.C. § 2706, entered in federal district court under the name *United States of America et al. v. ARCO Pipe Line Company and NORCO Pipeline Inc.,* Civil Action No. 1:96 CV 0280 (N.D. Ind.). The consent decree established a $2,507,500 court registry account for use exclusively on restoration, rehabilitation, replacement, or acquisition of equivalent resources injured by the release. This document outlines the extent of injuries to natural resources as a result of the diesel fuel spill and identifies strategies, alternatives, and projects for restoration of injured resources in the Fish Creek watershed.

EXECUTIVE SUMMARY

Fish Creek is the most pristine of the Maumee River watershed tributaries located in the southwestern drainage of Lake Erie. It supports 49 species of fish and 31 species of freshwater mussels, including 3 federally endangered species: the white cat's paw pearly mussel (*Epioblasma obliquata perobliqua*), the northern rifflesheIl mussel (*Epioblasma torulosa rangiana*), and the clubshell mussel (*Pleurobema clava*). The white cat's paw, according to the most recent scientific records, continues to survive nowhere else on earth, but in Fish Creek (Hoggarth 1990). Currently, the highest known mussel diversity, including the white cat's paw, occurs in the lower 10 miles of Fish Creek's 30 miles.

At approximately 6:00 a.m. on September 15, 1993, a pipeline owned by NORCO, Inc. ruptured, discharging an estimated 676 barrels (30,000 gallons) of #2 diesel fuel into a crop field in Dekalb County, Indiana. The diesel fuel made its way into a small drainage ditch that discharges to Fish Creek. This oil contamination entered Fish Creek, and spread downstream, crossing into Williams County, Ohio. As a result, numerous natural resources under the trusteeship of state and federal agencies pursuant to the Oil Pollution Act (OPA), 33 U.S.C. § 2701 et seq. have been, and may continue to be injured.

In 1996, the United States of America, the State of Indiana, and the State of Ohio settled claims for natural resource damages associated with the 1993 Fish Creek diesel fuel discharge. The claims were settled by consent decree under § 1006 of the OPA. The consent decree established a $2,507,500 court registry account for use exclusively on restoration, rehabilitation, replacement, or acquisition of equivalent resources injured by the spill.

Federal and state trustees will establish a restoration committee to review and recommend restoration activities to be funded with monies available in the court registry account. This document outlines the extent of injuries to natural resources as a result of the #2 diesel fuel discharge and identifies strategies, alternatives, and potential projects for restoration of injured resources in the Fish Creek watershed.

Three alternative strategies were considered by the trustees for restoration of Fish Creek: 1)combined protection and enhancement; 2)no action and; 3)in-stream remediation. In order to maximize recovery of injured resources, the trustees selected the combined protection and enhancement alternative as the proposed action. This alternative allows the trustees maximum flexibility in restoration projects and takes full advantage of currently available technologies to protect and enhance the impacted aquatic ecosystem.

Per the intent of the proposed action, the trustees developed a list of project activities and allocated potential court registry account monies to those activities. Projects were selected based on their potential to restore resources injured from the spill. The trustees selected restoration projects which would have the greatest potential to restore

the Fish Creek resources to their pre-spill population and recovery potential levels. The selected projects will result in habitat improvement and enhancement of endangered mussel population recruitment. The time frame needed for injured resources to recover to their pre-spill levels is unknown, but is suspected to be several years. Funds available for restoration projects are $2,507,500 which include monitoring the effectiveness of the restoration and plan implementation. The Fish Creek restoration court registry account will be allocated at approximately 56 percent for protection projects, 27 percent for enhancement projects, 9 percent for monitoring the effectiveness of the restoration activities, and 8 percent for implementation of the plan. In order to enhance restoration projects, the trustees are also seeking participation, cooperation, and matching funds from other federal, state, and local agencies, as well as organizations and private landowners interested in natural resource restoration projects.

This restoration plan/environmental assessment outlines the extent of injuries to natural resources as a result of the diesel fuel spill and identifies strategies, alternatives, and projects to restore Fish Creek to its pre-spill condition.

This document was provided to the public for a 41-day review and comment period. In addition, a public information meeting addressing the Environmental Assessment and Restoration Plan was held November 14, 1996, in Edgerton, Ohio. Following the public review period, the trustees determined that there was a "Finding of No Significant Impact" associated with the selected restoration. A summary of all public comments and the trustees' responses are provided in Chapter 8 of this document.

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A. OVERVIEW OF THE FISH CREEK WATERSHED

1. Location and General Environment

Fish Creek is a primary tributary of the St. Joseph River, which in turn is a tributary of the Maumee River in the southwestern drainage of Lake Erie. Located in northeastern Indiana / northwestern Ohio, the watershed of Fish Creek is approximately 110 square miles with agriculture as the primary land use. (Figure 1)

Fish Creek is a small to medium size, warm water stream with a modest gradient. Habitats within the creek itself are composed of a combination of slow, deep water pools and faster flowing, shallow riffles. Fish Creek's riparian corridor floods seasonally and supports typical floodway deciduous hardwood tree species.

Fish Creek is the most pristine of the Maumee River watershed tributaries. It is a delicate ecosystem which supports 31 species of freshwater mussels, including 3 federally endangered species: the white cat's paw pearly mussel (*Epioblasma obliquata perobliqua*), the northern rifflesheIl mussel (*Epioblasma torulosa rangiana*), and the clubshell mussel (*Pleurobema clava*) and a number of state listed species. The white cat's paw, according to the most recent scientific records, continues to survive nowhere else on earth except in Fish Creek (Hoggarth 1990). Currently, the highest known mussel diversity, including the white cat's paw, occurs in the lower 10 miles of Fish Creek's 30 miles.

Prior to the September, 1993 oil discharge, area landowners, The Nature Conservancy (TNC), the Indiana Department of Natural Resources (IDNR), the Indiana Department of Environmental Management (IDEM), the Ohio Department of Natural Resources (ODNR), Ohio Environmental Protection Agency (OEPA), the U.S. Fish and Wildlife Service (FWS), the U.S. Department of Agriculture's (USDA) Natural Resource Conservation Service (NRCS) and the Consolidated Farm Services Agency, Soil and Water Conservation Districts (SWCD), and local governments and organizations recognized the significance and value of Fish Creek and cooperated in the Fish Creek Preservation Project to preserve this unique natural ecosystem. This innovative partnership was developed in response to the desire and the responsibility to protect the rare and endangered species present in Fish Creek.

Based on a 1992 St. Joseph River watershed survey (Ohio EPA 1993), a recommendation was made to designate lower Fish Creek as an Exceptional Warmwater Habitat (EWH) in a 3-mile stretch from the Ohio-Indiana state line (River Mile [RM] 5.6) to the point where the St. Joseph River floodplain physically influences in-stream conditions (RM 2.4). (Figure 2) The remainder of the main-stem of Fish Creek is designated as Warmwater Habitat (WWH). EWH is the highest rating in Ohio's aquatic habitat classification scheme and is designed to protect communities of exceptional biological diversity and integrity (Rankin et al. 1990). This portion of Fish Creek was affected by the September, 1993 oil

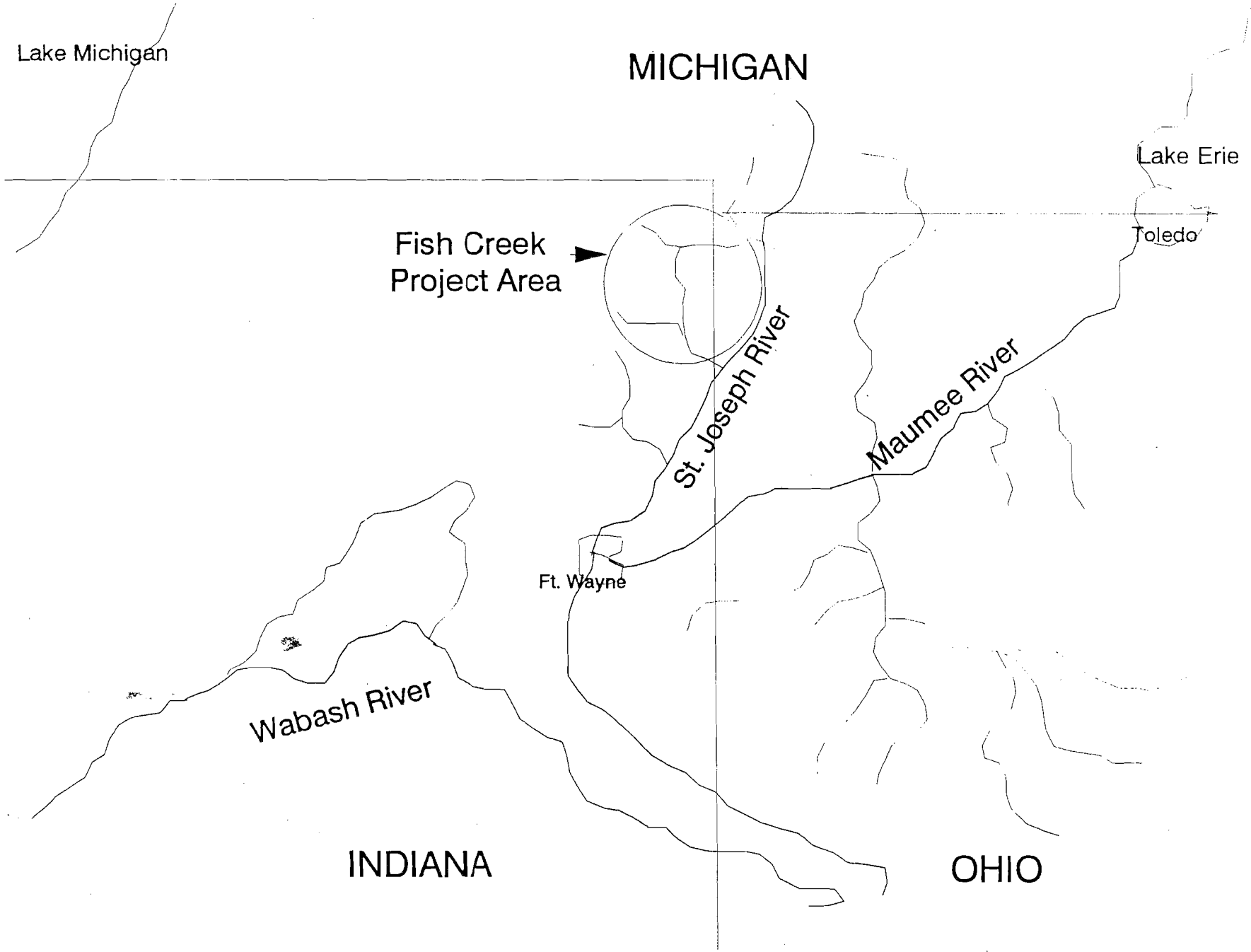

Figure 1. The regional location of the Fish Creek Project Area. Note the close proximity of the greater Maumee River and Wabash River watersheds.

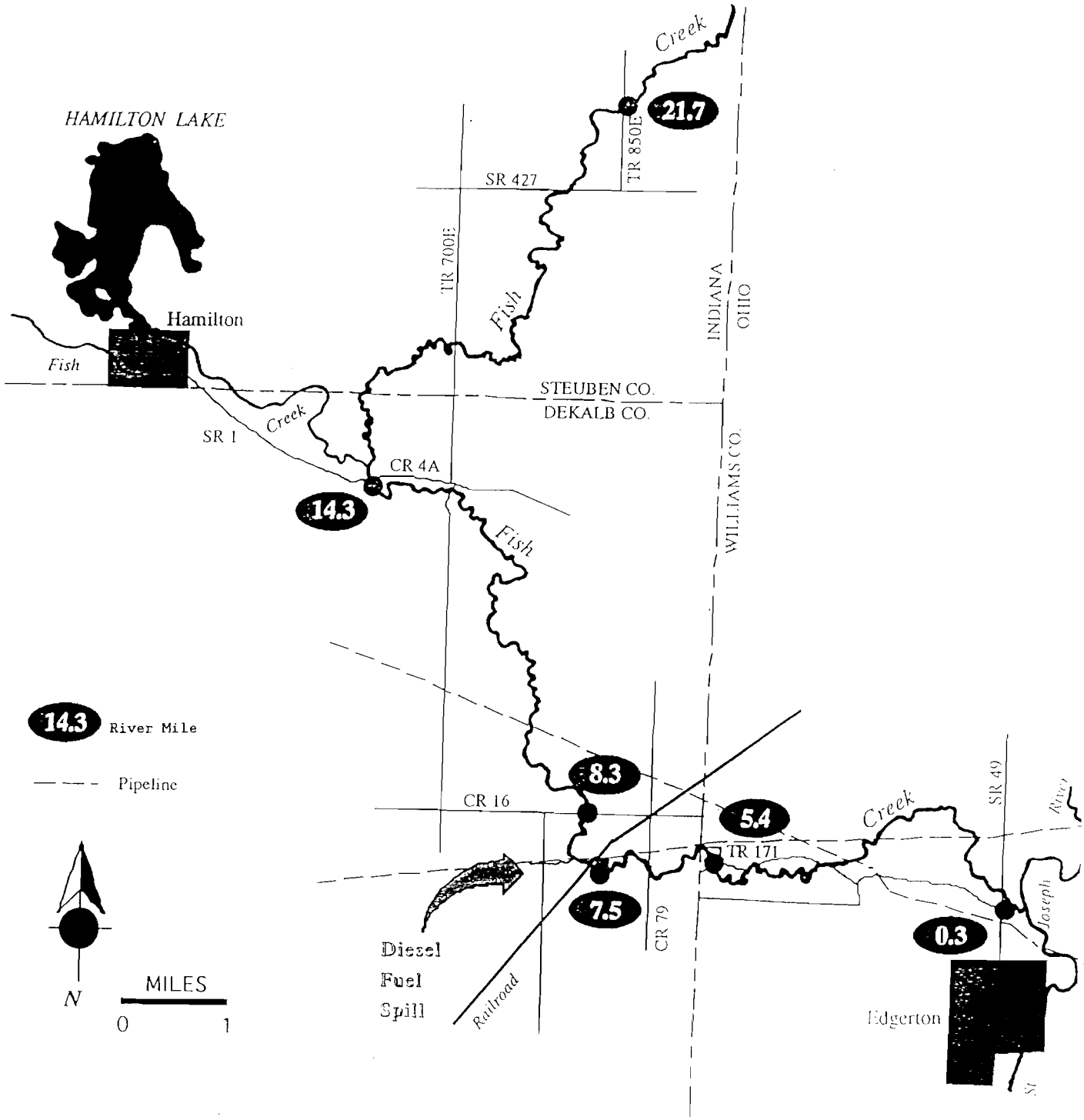

Figure 2. Map of Fish Creek area showing diesel fuel spill location.

discharge.

The National Heritage program in conjunction with TNC has given Fish Creek a B1 rating for biological diversity. This is the highest rating in the program's ranking system. It is given to sites of outstanding significance that TNC believes are critical to preserve. According to TNC, "Fish Creek represents the best remaining example of the unique riverine community that once characterized the western Lake Erie basin." (TNC 1993, Unsworth et al., 1994).

2. Habitat Threats

TNC has developed a Fish Creek Bioreserve Project Strategic Plan. This plan identifies the primary threats to the Fish Creek aquatic ecosystem as those which degrade water quality, water quantity, and habitat structure. Conversion of deciduous forest land to intensive row crop agriculture has led to increased erosion of soils and subsequent runoff into the creek reduces water quality and increases the transport of soil particles and chemical pollutants (insecticides, herbicides, and fertilizers). The input of these materials may produce acute and/or chronic effects which disrupt the life cycles of biota in the stream. The aforementioned threats are consistent with threats identified by the Fish Creek Preservation Project partners and the federal and state trustees.

Mussels and their host fish are especially vulnerable to non-point source pollutants, such as agricultural run-off. Increased movement of soil into the stream results in stream bed siltation, which may directly kill some organisms or indirectly reduce population levels by decreasing in-stream habitat suitability for other species. The removal of riparian vegetation decreases terrestrial and aquatic habitat structure, reduces shade (which may increase peak summer water temperatures), and increases stream bank erosion potential. The removal of native vegetation and wetlands also reduces groundwater recharge, which results in reduced baseflow conditions during periods of low flow. In addition, construction activities in or adjacent to the stream are a serious threat to localized mussel beds. These activities can result in direct habitat disruption or in greatly increased siltation/habitat degradation downstream.

B. BACKGROUND OF INCIDENT AND INJURY

1. Incident

On the morning of September 15, 1993, an apparent operator error in main valve fuel transfers caused pressure to build up and surge through Norco's pipeline, ultimately causing a rupture in the pipeline. At the time of the accident, the pumps lost pressure and the pipeline went to static pressure only (what oil was in the pipe would flow with the gravitational pull). The nearest high point on the line is Kendallville, Indiana with a continued down-gradient for approximately 17 miles to the spill site.

The pipeline rupture occurred in a soybean field in Dekalb County, Indiana. Approximately 676 barrels (30,000 gallons) of #2 diesel fuel were discharged contaminating approximately 30,000 square feet of soil at the pipeline break. The discharged oil followed a path from the crop field down-gradient through drainage tiles into a drainage ditch fed by an 18 inch corrugated pipe coming out of the ground approximately 5 feet below grade and 400 feet south of the discharge site. The oil flowed through the drainage ditch to Fish Creek. Approximately 7 miles of Fish Creek and its associated wetlands were contaminated by this oil discharge (Figure 2). Numerous natural resources under the trusteeship of federal and state agencies were injured as a result of the #2 diesel fuel discharge into the Fish Creek watershed.

The following officials, or their representatives, are parties to a Memorandum of Understanding (MOU) intended to address the diesel fuel discharge into the Fish Creek watershed: the Assistant Commissioner, Office of Environmental Response, Indiana Department of Environmental Management; the Deputy Director, Bureau of Water and Resources Regulation, Indiana Department of Natural Resources; the Director, Ohio Environmental Protection Agency; the Director, Ohio Department of Natural Resources; the Regional Director, U.S. Fish and Wildlife Service, Department of Interior; the Director, Office of Environmental Policy and Compliance (OEPC), Department of the Interior. The MOU established a natural resource trustee council to assess natural resource injuries and develop a restoration plan.

The trustees settled claims for natural resource damages by consent decree (*United States of America et al. v. ARCO Pipe Line Company and NORCO Pipeline Inc.,* Civil Action No. 1:96 CV 0280 (N.D. Ind.)) under § 1006 of the OPA. The consent decree established a $2,507,500 court registry account for use exclusively on restoration, rehabilitation, replacement, or acquisition of equivalent resources injured by the spill. This restoration plan documents the extent of injuries to natural resources as a result of the oil spill and identifies strategies and alternatives for restoration of injured resources in the Fish Creek watershed.

2. Fish and Wildlife Resources and Natural Resource Injury

The Maumee River and most of its tributaries have been seriously degraded by the loss of riparian areas, point and non-point source pollution, and channelization activities. This degradation has eliminated pollution-sensitive species and those with strict habitat requirements from most of the basin. Fish Creek represents the last stronghold for the unique faunal assemblage that once characterized the Maumee river\western Lake Erie drainage and, therefore, represents a unique portion of the Great Lakes Basin's natural heritage. In its lower reaches, Fish Creek is large enough to provide habitat for many of the large-river mussels that characterized this unique assemblage. Fish Creek is literally an ark in which much of the original Maumee River fauna is sheltered.

The remarkably diverse and imperilled aquatic fauna supported by Fish Creek, which currently includes 31 mussel and 49 fish species, may be the most diverse stream community remaining in the Great Lakes

watershed. Three of the mussel species are federally endangered and 12 of the mussels, 3 aquatic associated reptiles, and 1 amphibian species are state endangered, threatened, or of special concern.

The oil discharged into Fish Creek (#2 diesel fuel oil) is considered to be the most toxic component of artificial refinery mixtures (Buikeima et al. 1981). The water soluble fraction (WSF) is the most soluble petroleum component of the fuel oil. Once in the water, the WSF becomes available for uptake and accumulation in aquatic organisms, making it the most acutely toxic component of petroleum constituents to aquatic biota. Once petroleum hydrocarbons are released into the environment, they are sequestered into the sediments and slowly released back into the water column over a period of time (Caldwell 1993).

The natural resources under the trusteeship of the DOI, the State of Indiana, and the State of Ohio were adversely affected by the diesel fuel spill. Initially, a substantial quantity of undiluted diesel fuel reached Fish Creek, causing widespread death of fish, macroinvertebrates, mussels, turtles, frogs, muskrats, wood ducks, and kingfishers along the lower 7 miles of Fish Creek. Long-term impacts to the Fish Creek ecosystem have also been identified. Water-soluble, polycyclic aromatic hydrocarbons (PAH) persist in sediments, thus it is likely that the diesel fuel trapped within the sediment may result in long-term exposure of Fish Creek biota to PAHs (Caldwell, 1993). Animals that feed at the sediment surface, or are filter-feeders (such as mussels), will have maximum exposure to sediment-associated PAHs. Petroleum constituents will also bind to organic materials exposing detrital-feeders, such as mussels, to contaminated detritus. This may result in long-term acute and/or chronic exposure to animals of the ecosystem utilizing organic materials as a food source and also may serve as a pathway for petroleum constituents to enter the food chain. Acute mortalities of birds and muskrats are indicative of short-term injury; sublethal effects are suspected to be minor in these species. However, sublethal exposures may continue and studies of the accidental and intentional release of fuel oils to the aquatic environment indicate that aquatic organisms are able to bioaccumulate some hydrocarbon fractions, particularly PAHs (U.S. Department of Health and Human Services 1993). Therefore, potential long-term chronic impacts from bioaccumulation of diesel fuel constituents through the aquatic food chain in Fish Creek are possible.

There were acute and likely sublethal impacts to freshwater mussels from the spill. Mussels are sessile organisms that cannot flee catastrophic pollution events, as they spend their entire life partially or wholly buried in the stream substrate. The spill plume area, where the most significant endangered mussel populations reside, appears to be retaining diesel fuel in the sediments. Freshwater mussels have very sensitive life and reproductive stages that are openly exposed to water and sediment contamination. Freshwater mussels have external fertilization which exposes sperm to water pollution; mussel larva and fish hosts are also susceptible to water contamination. The juvenile mussel life stage is possibly the most critical stage for toxicity from contaminated sediment. Juvenile mussels are expected to live totally buried in the substrate for approximately 4 years, relying on fine sediment as a food source or vector. Fine sediment is also a good

binder for organic pollution such as toxic hydrocarbon products of diesel fuel.

Additionally, although direct mortality of fish and other species were not verified beyond the 7 mile stretch of Fish Creek into the St. Joseph River, chronic effects and impacts to food resources (aquatic invertebrates) likely occurred in these areas. Additional aquatic associated mammals, reptiles, amphibians, and bird species may have been indirectly impacted by the spill due to destruction of their food base, foraging areas, shelter, breeding and rearing areas, and other factors essential for long-term survival.

The capacity of the Fish Creek system to support diverse and rare species as well as consumptive activities (i.e. hunting, fishing, trapping) may be reduced for many years as a result of the spill.

C. PURPOSE OF THE PROPOSED ACTION

The purpose of the proposed restoration plan is to restore, rehabilitate, replace, and/or acquire the equivalent of any natural resources injured or destroyed by the Fish Creek diesel fuel spill, pursuant to applicable state and federal laws and regulations.

D. NEED FOR THE PROPOSED ACTION

The need for the proposed action is to ensure the restoration and recovery of resources injured as a result of the spill.

E. RESTORATION ALTERNATIVES CONSIDERED

Following are 3 restoration alternatives the trustees identified to restore the Fish Creek trust resources to their pre-spill condition.

1) Combined Protection and Enhancement: Under this alternative, a variety of permanent protection, temporary protection, habitat enhancement, and mussel recovery enhancement alternatives and projects would be utilized on lands containing important aquatic and terrestrial habitats or having significant influence on aquatic ecosystems. Permanent protection provides perpetual control and management authority over these lands whereas temporary protection provides temporary or interim control and management authority. Temporary protection may allow for resource protection where a more permanent alternative is unavailable or undesirable. Habitat enhancement alternatives include management actions which would improve productivity and speed recovery of existing habitats through the addition of key structural or biological elements. Mussel recovery enhancement includes research and management action that will improve mussel population recruitment and productivity. Implementation of this restoration would restore the natural riparian community structure and flood

plain function, reduce inputs of sediments and nutrients from the flood plain, provide organic debris sources, moderate fluctuations in water temperatures, provide additional aquatic and terrestrial habitat, and enhance natural mussel recovery. This combined-action restoration will improve water quality, water quantity stability, habitat, and recovery of mussel populations to restore Fish Creek to its pre-spill condition and is the proposed action.

2) No Action Alternative: Under this alternative, no actions would be taken to restore resources injured by the diesel fuel spill. Benefits only would arise if the injured aquatic resources are able to recover to pre-spill population levels without restoration actions. Although some natural recovery is expected, the acute and sublethal injuries to trust resources associated with the spill make unmitigated recovery a long and uncertain process. Additionally, endangered mussel species may never reach their pre-spill recovery potential without additional protection and enhancement restoration activities.

3) In-stream remediation alternative: This alternative would involve dredging/sediment removal or sediment agitation such as described in National Oceanic and Atmospheric Administration's Restoration Guidance Document for Natural Resource Injury as a Result of Discharges of Oil. This restoration alternative would cause further injury to already imperiled sediment-associated endangered mussel fauna.

F. SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

Alternative 1 - Combined Protection and Enhancement

Injuries to Fish Creek natural resources occurred as a result of the diesel fuel spill. The trustees selected alternative #1 as the proposed restoration option based on the potential to restore resources injured in the spill. Within the combined protection and enhancement alternative, the trustees selected restoration project options that have the greatest potential to restore resources to their pre-spill population and recovery levels, as well as benefit the overall aquatic ecosystem of Fish Creek. This alternative allows the trustees maximum flexibility in selecting restoration projects that take full advantage of currently available technologies and methodologies to protect and enhance the impacted aquatic ecosystem. It is the environmentally preferred restoration and alternative because it will maximize the recovery of injured resources, yet provide flexibility for implementation. In addition to direct mussel recovery activities, the trustees' priority for the selection of restoration projects will be permanent protection, followed by temporary protection, and then habitat enhancement projects.

Alternative 2 - No Action

The goal of the OPA § 1006 is to make the environment and public whole for injuries to natural resources resulting from an incident involving an oil discharge. This goal is achieved through returning injured natural resources to baseline and compensating for interim losses of such natural resources through restoration, rehabilitation, replacement

or acquisition of equivalent natural resources. Alternative #2 (no action) does not allow for restoration, rehabilitation, replacement, or acquisition of equivalent resources injured in this spill. Without restoration enhancement, recovery of rare mussels and other injured resources may never reach their pre-spill levels in Fish Creek and the public would not be compensated for injury to natural resources.

Alternative 3 - In-stream Remediation

In-stream remediation would involve dredging/sediment removal or sediment agitation. Dredging of the Fish Creek substrate would kill rare mussels and destroy their habitat. Agitation of sediment would resuspend oil-contaminated sediment potentially adding to the toxic impacts to rare benthic fauna and may kill mussels by smothering them with siltation. Alternative #3 is not feasible because this recovery activity would add direct adverse impacts to already impaired substrate-associated fauna, such as the endangered mussels, rather than aid in their recovery.

CHAPTER 2. DESCRIPTION, BENEFITS, ENVIRONMENTAL CONSEQUENCES, SCHEDULE, AND ESTIMATED BUDGET OF PROPOSED RESTORATION STRATEGIES

The restoration objectives identified by the trustees as necessary for adequate restoration of Fish Creek include direct mussel recovery enhancement, water quality improvement, riparian corridor protection, building beneficial community relations, and monitoring the restoration results, and allocations for plan implementation.

The trustees have developed a list of strategies and goals which include potential allocations of court registry account monies. The trustees will select a restoration committee to refine and carry out the identified strategies. The restoration committee will also actively seek participation, cooperation, and matching funds from other federal, state, and local agencies, as well as organizations and private landowners interested in natural resource restoration projects. These projects will be implemented throughout the 70,400 acre Fish Creek Watershed. Funds for the restoration of injured resources were recovered under § 1006 of the OPA. Recovered funds were placed in a court registry account in the Registry of the United States District Court, and the funds are administered by the Court. Prior to the expenditure of court registry account monies, a restoration plan must be prepared. Guidance applicable to the restoration, rehabilitation, replacement, or acquisition of equivalent resources is contained in 43 Code of Federal Regulations, Section 11.93, Department of Interior Natural Resource Damage Assessment Regulations and in 15 Code of Federal Regulations, Part 990, Department of Commerce Natural Resource Damage Assessment Regulations. Additionally, in developing the restoration plan, the FWS gives priority to alternatives that result in restoration of in-kind natural resources at the same location and vicinity, as required by the Service's Mitigation Policy (Federal Register Vol. 46. No. 15, January 1981). The Fish Creek #2 Diesel Fuel Spill Restoration Plan was developed in accordance with these regulations.

Funds available for restoration projects are $2,507,500 which include funding for monitoring the effectiveness of the restoration and plan implementation. Restoration court registry account monies will be allocated at approximately 56 percent for protection projects, 27 percent for enhancement projects, 9 percent for monitoring the effectiveness of the restoration activities, and 8 percent for implementation of the plan.

A Memorandum of Understanding (MOU) between the trustees notes that "the trustees will oversee the development and the implementation of a plan for the restoration, replacement, and/or acquisition of equivalent resources for those trust resources, and the services provided by those resources, that may be injured, destroyed, or lost." The trustees will appoint and oversee a Fish Creek restoration committee (committee). This committee will assist the trustee council in selecting restoration activities and implementing components of the restoration plan. Meeting these requirements will entail the development of habitat restoration and enhancement projects for fish and wildlife residing in the Fish Creek watershed to compensate for the natural resource losses resulting from the spill. Emphasis will be placed on enhancing natural recovery, habitat, water quality, and community relations. The committee will

seek matching funds where appropriate. Committee decisions on the restoration plan shall be through consensus with final approval by unanimous consent of the trustee council, in accordance with the existing MOU.

A. *MUSSEL RECOVERY ENHANCEMENT*

Description

A post-spill mussel die-off in Fish Creek indicates that the recovery of endangered mussels has been hampered by the diesel fuel discharge into the waters and sediment of Fish Creek. Direct enhancement of mussel recovery will require investigations into habitat and recruitment requirements of these species and then implementation of developed methodologies to supplement natural recovery in Fish Creek. Supplementing mussel recruitment in Fish Creek will enhance natural recovery with the intent of reaching pre-spill recovery opportunity.

Benefits

The diesel fuel spill occurred in the most environmentally sensitive portion of Fish Creek, directly coinciding with the endangered mussel populations. The only known surviving white cat's paw pearly mussel population left on earth is directly within the diesel fuel spill zone of Fish Creek. Natural recovery of the 3 federally endangered species in Fish Creek has been detrimentally impacted by the diesel fuel release. Without supplementing the natural recovery with recruitment enhancement efforts, some of the already endangered species may be in jeopardy of becoming extinct. These activities will increase the likelihood of federally endangered mussel recovery in Fish Creek as well as provide valuable management information for declining freshwater mussel populations throughout the nation.

Project Strategy(ies): Fish Creek Endangered Freshwater Mussel Life Requirement Investigation, Reintroduction of Early Life Stage Mussels, Surveying for Additional Populations and/or Habitats.

Purpose(s): Mussel recovery enhancement activities will improve natural endangered mussel recovery by providing general knowledge of life requirements and utilizing this knowledge to implement activities to enhance natural recruitment.

Proposed Activity(ies): The proposed plan will result in: (1) identification of fish host(s) for the 3 federally endangered species; (2) determination of preferred habitat characteristics for mussel species targeted for reintroduction; (3) artificial infection of host fish with mussel larva; (4) release of host fish, mussel larval-infected host fish, and/or juvenile mussels to Fish Creek; (5) surveying of additional areas for supplementary populations and/or adequate habitat; and (6) possibly translocation/reintroduction of rare mussel species to new sites. The Fish Creek sediments will continue to be evaluated for their

toxicity to juvenile mussels. Mussel recruitment in Fish Creek will not be supplemented until the sediments are determined safe for reintroduction. Trustee agencies that may be involved with mussel recovery enhancement include the FWS, IDNR, and the ODNR.

Location(s): These strategies are proposed throughout the Fish Creek watershed where acceptable habitat or populations exist, prioritizing the impacted area where endangered mussel populations historically existed. If reintroductions are either very successful, or the Fish Creek environment is too contaminated to support early life stages of endangered mussels, other watersheds outside Fish Creek may be considered for these strategies.

Environmental Consequences: Only mussel and host fish species native to this watershed will be used for recruitment enhancement activities. Improving mussel reproductive capabilities will improve the stability of sensitive species, as well as preserve and enhance the biological diversity of this unique system.

Schedule: Investigations of host fish and habitat requirements will begin immediately and be concluded within 5 years. Actual implementation of recruitment enhancement activities will begin in 1 - 2 years depending on the identification of life requirements and the residual suitability of the Fish Creek sediments for reintroduction of sensitive life stages. Additional population surveys will be conducted in the next 1 - 2 years. All mussel enhancement activities will be concluded within 5 years, unless additional funding opportunities are available.

Estimated Budget: Potential court registry account monies for all activities = $390,000

B. FISH CREEK WATERSHED WATER QUALITY IMPROVEMENT

Description

Project strategies for water quality improvement will focus on reducing soil erosion in the Fish Creek watershed. Activities will target the modification of land use patterns and management techniques to minimize adverse effects on water quality. The watershed approach will allow for potential enhancement of natural ecological processes of the Fish Creek ecosystem.

Benefits

Significant reductions in the amount of sedimentation in Fish Creek should occur, as well as a reduction of the amount of soil loss in the watershed. Wetlands naturally provide flood attenuation and ground water recharge areas. Proposed activities will restore natural riparian community structure and flood plain function, reduce inputs of sediments from the flood plain, provide organic debris sources, and moderate fluctuations in water temperatures which will improve habitat for resident fish and mussels. If implemented, these activities will

improve water quality and accelerate the recovery of impaired aquatic communities of Fish Creek.

Project Strategy(ies): Conservation Tillage, Promotion of Non-Row Crop Agriculture, Reforestation of the Floodplain, Wetland Restorations, Fencing of Livestock, Stabilization of Streambank Erosion, and Implementation of Mechanical Barriers in the Fish Creek Watershed

Purpose(s): These project activities will improve aquatic habitats by minimizing land use effects, restoring the natural riparian community structure and floodplain function of Fish Creek, and encouraging Best Management Practices (BMP).

Proposed Activity(ies): The proposed activities will promote conservation tillage and enhance floodplain and stream-side habitats by: (1) providing cost-share incentives to farmers; (2) reforesting the floodplain; (3) excluding stream-bank grazing with riparian fencing; (4) restoring wetlands in the watershed; (5) encouraging enrollment in the Wetland Reserve Program; and (6) promoting the use of BMPs for construction, development, and farming activities occurring in the watershed. Mechanical barriers may provide nonpoint source control and best management practices at construction sites within the watershed to minimize the erosion potential at the sites. These may include, but are not limited to, temporary diversions, silt fencing, and straw bale filters. These practices are described in the Indiana Drainage Handbook, An Administrative and Technical Guide for Activities within Indiana Streams and Ditches as practices 104, 105, and 106, respectively. Trustee agencies that may be involved with Fish Creek Watershed water quality improvement include the FWS, IDNR, ODNR, and the OEPA. Projects will be developed and implemented through coordination with the restoration committee.

Location(s): These activities will take place throughout the entire Fish Creek watershed where willing landowner participation permits. Initial project implementation will focus on priority or problem areas.

Environmental Consequences: Conservation tillage will reduce the sedimentation, nutrient loading, and herbicides/pesticides run-off in the watershed. Reforestation will result in the return of native stream-side vegetation, and will enhance flood control, minimize fluctuations of stream water temperature, improve bank stability, reduce sediment inputs, and improve water quality. Riparian exclusion fencing will minimize the stream bank erosion and sedimentation of Fish Creek due to livestock accessing the stream. Implementation of BMPs will minimize the impacts of point-source sedimentation problems in the watershed. All activities should minimize the effects of land use and improve water quality in Fish Creek, resulting in increased aquatic biotic integrity and chances of recovery for Fish Creek mussels.

Schedule: This project should be implemented and completed in

approximately 5 years.

Estimated Budget: Potential court registry account monies = $399,500

C. RIPARIAN CORRIDOR PROTECTION

Description

Riparian Corridor Protection may consist of permanent protection of land through acquisition, easements, leases, or covenants and implementation of management actions which provide protection in perpetuity for lands containing important habitats or having significant influence on water quality and aquatic communities. This may be accomplished through acquisition of fee title interest, easements, leases, deed restrictions, or covenants from willing landowners on lands containing important fish and wildlife habitats or having significant influence on aquatic ecosystems. Effects on flooding and drainage will be an integral component of these activities.

Benefits

Riparian corridor protection will provide additional terrestrial habitat along streams, and will help stabilize stream banks, reduce inputs of sediments from the floodplain, provide organic debris sources and instream cover for fish, provide substrates for macroinvertebrate production, moderate fluctuations in water temperatures, and provide physical protection from livestock grazing through the construction of riparian enclosure fencing. These actions will restore the natural structure and function of stream ecosystems in the Fish Creek watershed and provide perpetual control and management authority over lands containing important habitats or influencing aquatic ecosystems in a cost-effective manner.

Project Strategy(ies): Riparian Corridor Protection through Cooperative Efforts from Willing Landowners on Perpetual Easements, Leases, Covenants, or Land Acquisition Combined with Restoration and Enhancement Activities

Purpose(s): In an effort to protect and preserve the biological diversity of Fish Creek, the Fish Creek Preservation Project partners, including members of the local community, have been actively involved in the restoration and preservation of Fish Creek. Acquisition, perpetual easements, leases, or covenants, combined with restoration and enhancement of these lands are expected to improve water quality, increase populations of the imperilled mussels, and provide improved habitat for a diversity of wildlife. **These activities cannot be implemented without willing landowner participation.** Riparian corridor protection includes management actions that improve productivity and speed

recovery of existing habitats through the addition of key structural or biological elements. The project goal is to restore the natural structure and function of the Fish Creek stream ecosystem. This project will enhance the Fish Creek Project partners' goals for the watershed.

Proposed Activity(ies): The proposed plan will include acquisition of lands from willing landowners and/or acquisition of management control of lands containing important habitats or having significant influences on the stream ecosystems through perpetual easements or lease agreements with land owners. Additionally, purchasing "development rights" and acquisition and resale of lands with the addition of protective land use covenants to the title of ownership will be considered. Restoration and enhancement, as described in the water quality improvement activities, will be achieved through removal of unnatural constraints on the structure and function of the stream ecosystem so that natural recovery may occur. Trustee agencies that may be involved with riparian corridor protection include the FWS, IDNR, IDEM, ODNR, and the OEPA.

Location(s): The proposed activities will take place throughout the entire Fish Creek watershed where willing landowner participation permits. Initial project implementation will focus on priority or problem areas.

Environmental Consequences: Implementation of the proposed activities will restore the condition, structure, and functioning elements of aquatic and riverine ecosystems to natural conditions. These actions are expected to increase populations of aquatic species, especially imperilled mussels, and provide improved habitat for a variety of fish and wildlife. Potential negative impacts may include the reduction of row crop acreage and decreased livestock foraging along the stream bank due to exclusion of these activities from riparian areas.

Schedule: A comprehensive riparian inventory of the Fish Creek watershed will need to be completed by the co-trustees within 1 year. This inventory will be managed using a Geographical Information System (GIS) which will also be used for the management of monitoring data and for tracking restoration activities in the watershed. Using this information, acquisition, easements, leases, and/or covenant efforts should target priority areas in the watershed. Priority areas will include those areas that are currently impairing the natural structure and function of the Fish Creek stream ecosystem and areas which provide unique fish and wildlife habitat. Court registry account monies would be used to leverage acquisitions, easements, leases, and/or covenants and potentially to obtain matching funds. The project should be completed in 5-10 years.

Estimated Budget: Potential court registry account monies = $1,243,000

D. COMMUNITY RELATIONS

Description

Community relations will focus on preserving the value of the watershed by providing the public with the history and status of the Fish Creek diesel fuel spill; general freshwater mussel biological information; knowledge of the importance of preserving biodiversity; significance and requirements of the species in Fish Creek; preservation management strategies; and the roles of trustee agencies, cooperating agencies, and private landowners and others involved in the NRDA and preservation project.

Benefits

The Fish Creek watershed supports predominately agricultural land use with multiple landowners being the primary stewards of the watershed. Community relations in the watershed will aid in the preservation and recovery of the Fish Creek ecosystem through information transfer and sharing, as well as improve the general understanding and significance of diverse aquatic communities and the roles of natural resource managers.

Project Strategy(ies): Public Outreach to Educational Institutions, Local Organizations, and Individual Landowners; Develop and Distribute Educational Posters of Fish Creek Freshwater Mussels; Develop and Distribute Interpretive Video About the Fish Creek Ecosystem.

Purpose(s): Improving community relations will enhance the understanding of the significance and uniqueness of the Fish Creek ecosystem. It will continue to stress open communication between natural resource managers, landowners, and the general public in the watershed so that protection strategies may be developed and implemented to improve and protect the water quality and overall health of the system. By improving the overall health of the ecosystem, unique resources will be preserved and injured resource recovery will be enhanced.

Proposed Activity(ies): The proposed activities will provide outreach to the public through distribution of information at schools, various organizational meetings, media events, and through communication with individuals in the watershed. Depending on the audience, this information may include: (1) the history and status of the Fish Creek diesel fuel spill; (2) general freshwater mussel biological information; (3) the significance and requirements of the species in Fish Creek; (4) preservation management strategies; and (5) the roles of trustee agencies and others involved in the restoration of Fish Creek.

Informational Fish Creek freshwater mussel posters as well as an interpretive video of Fish Creek may be developed and distributed to the public. Trustee agencies that may be involved in community relations include the FWS, IDNR, IDEM, ODNR, and the OEPA.

Location: This information transfer and sharing would take place within the entire Fish Creek watershed. Forms of this outreach will likely extend beyond the watershed.

Environmental Consequences: Public outreach will improve the understanding of the significance of the watershed and the importance of responsible land management activities. It will provide aquatic biology education as well as allow for interactive communication between landowners, concerned public, and natural resource managers to preserve and enhance the Fish Creek ecosystem without compromising or alienating existing land uses.

Schedule: This project will be implemented as quickly as possible and will conclude approximately 2 years after implementation, unless additional funding is secured to continue and expand the outreach.

Estimated Budget: Potential court registry account monies = $50,000

E. MONITORING THE EFFECTIVENESS OF RESTORATION ACTIVITIES

Description

Monitoring activities may include assessing the ambient condition of the mussel, fish, and invertebrate communities, water quality, and sediment toxicity.

Benefits

These monitoring activities will provide continued monitoring of the effects of the September 15, 1993 spill, determine the current aquatic life uses attainment for Fish Creek (per Ohio Administrative Code (OAC) 3745-1-07), and measure the restoration success.

Project Strategy(ies): Monitor Biological, Chemical, and Physical Parameters to Evaluate the Effects of the Spill and Restoration Success.

Purpose(s): The purpose of monitoring activities is to provide trustees with data to evaluate the effects of the spill and to monitor restoration success.

Proposed Activity(ies): The proposed activities under this strategy include monitoring of: (1) fish; (2) mussels; (3) other aquatic invertebrates and communities found in Fish Creek; (4) PAH residues in the sediment of Fish Creek; (5) water quality; (6) the

toxicity of Fish Creek sediment to the most sensitive mussel life stage and host fish, and (7) habitat quality, including hydrology, riparian vegetation, and stream morphology. Trustee agencies that may be involved with monitoring activities include the FWS, IDNR, IDEM, ODNR, and the OEPA.

Location(s): Monitoring will occur throughout the Fish Creek watershed and at sites that may be considered for recolonization and will focus on the spill-impacted area. Monitoring in non-affected areas will provide reference (or comparison) data.

Environmental Consequences: All monitoring activities should aid trustees in the restoration of Fish Creek and identify potential problem areas in the watershed, thereby enhancing the chance of recovery for Fish Creek mussels.

Schedule: Monitoring activities may continue through Fiscal Year 2009.

Estimated Budget: Potential court registry account monies = $225,000

F. RESTORATION IMPLEMENTATION

1. Thresholds

The diesel fuel spill resulted in the widespread death of fish, aquatic invertebrates (including mussels), reptiles, amphibians, mammals, and birds. Sublethal impacts to fish and wildlife are expected from the acute exposure of diesel fuel, as well as the continued chronic exposure to contaminated sediments. The trustees selected restoration projects that would have the greatest potential to restore Fish Creek resources to their pre-spill population levels and would also benefit other aquatic-associated resources. The selected projects will result in improved spawning and rearing habitat for resident fish and mussels and enhance natural recovery of endangered mussels. The designated recovery plans should increase the production of these species in the Fish Creek watershed. The time frame needed for these species to recover to their pre-spill levels is unknown, but is suspected to be several years. Additionally, with improved habitat conditions, resident fish and mussel populations may exceed pre-spill population levels.

The trustee council will have oversight of implementation of all recovery and restoration activities. The restoration committee will assist the trustee council in implementing the watershed water quality and riparian corridor protection components of the plan.

This restoration plan will be subject to a minimum annual review including an evaluation of the monitoring data and any other additional information available. The reviews will include a determination of the efficacy and suggestions for improvement of the implemented projects, proposals for new projects, and new options and technologies that become available. The annual review may result in the redistribution of funds

based on the feasibility of specific projects. Every effort will be made to implement the land based activities on a watershed approach, commensurate with each State's watershed portion and the availability of willing land holders. Proposed revisions to the plan will be reviewed by the trustees. Major revisions will also be subject to public review. Revisions to the plan will be guided by documented evidence and best professional judgement.

2. Schedule and Budget

The estimated budget for restoration implementation is $200,000. Detailed schedules and budgets for implementation of specific restoration projects will develop as the restoration process continues and individual projects are selected.

CHAPTER 3. AFFECTED ENVIRONMENT

Section 1006 of OPA and the Memorandum of Understanding between the DOI, the State of Indiana, and the State of Ohio allow court registry account expenditures only on restoration, rehabilitation, replacement, or acquisition of equivalent resources injured in the Fish Creek #2 diesel fuel spill. Meeting this requirement entails the development of habitat restoration and enhancement projects for resident fish and mussel populations in the Fish Creek watershed to compensate for the trust resource losses resulting from the spill. In order to restore natural resources injured by the spill, the trustees determined that priority areas within the entire 110 square mile Fish Creek watershed required consideration.

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

Providing improved habitat for fish and mussels within the Fish Creek watershed, as well as enhancing natural mussel recruitment, will aid in replenishing the injured resources. Appropriate restoration projects in the Fish Creek watershed will increase the survivability of fish and mussels not killed during the diesel fuel spill and will aid in replenishing the natural population by increasing productivity levels. Restoration projects will provide more and better habitat for juvenile mussel and fish rearing and food resources, increase aquatic fauna reproductivity, and increase juvenile and adult survival. Completion of restoration actions and full recovery of the fish and long-lived mussel populations could take more than 10 years.

In order to restore resources lost as a result of the spill, the trustees examined a variety of restoration alternatives. These included 1) a combined protection and enhancement alternative that combines permanent protection, temporary protection, habitat enhancement, and mussel recovery enhancement; 2)a no-action alternative and; 3) an in-stream remediation alternative. Project specific environmental consequences for each of the alternatives and associated projects are provided in Chapters 1 and 2.

Although a diverse variety of fish and freshwater mussels occurs within the Fish Creek watershed and its tributaries, their production and survival is affected by a number of activities which occur in the watershed. These activities include agriculture, timber production and harvest, livestock grazing and feedlot contamination, water withdrawal, channelization, wetland drainage, road construction, and point-source discharges. Many of these activities have impacted Fish Creek and its tributaries resulting in areas of poor surface shading, lack of woody debris in channel areas, lack of cover, poor depth-to-width ratio, and fair-to-poor bank stability. Implementation of the proposed restoration strategies should improve these conditions in localized areas and restore the potential of endangered mussel recovery and injured natural resources to their pre-spill levels.

Four restoration objectives were developed from the proposed action (combined protection and enhancement restoration alternative): direct mussel recruitment enhancement, water quality improvements, riparian corridor protection, and community relation efforts. Restoration project monitoring and implementation plans are also a part of this restoration plan. A variety of activities were identified in Chapter 2 for each objective.

Since the projects for the preferred combined protection and enhancement alternative are primarily designed to restore degraded habitats and improve fish and mussel recruitment, the cumulative environmental consequences will be beneficial. These cumulative impacts include long-term restoration of the warm water aquatic ecosystem to its natural conditions, enhanced riparian habitat, moderated water temperature fluctuations, improved bank stability and reduced sediment inputs, aquifer recharge, improved water quality, reduced sediment loads and scouring by natural flood retention, increased knowledge of freshwater mussel life history requirements, and endangered mussel recruitment

enhancement. These impacts will result in improved recovery enhancement of endangered mussels within the Fish Creek watershed. A perceived potential negative impact of these projects would be the loss of land in agricultural production and livestock foraging areas along the river bank. However, agricultural conversion and farm animal exclusions would occur only in circumstances where there are willing landowners interested in participating.

Environmental consequences would not be limited to the project location. Indirect beneficial impacts would also occur for some distance downstream of the selected projects. These impacts include decreased siltation, improved water quality, moderation in water temperature fluctuations, more stable stream flow patterns, and possible expansion of aquatic habitat and fauna. Cumulative impacts at the project locations, as well as in the surrounding riverine area, are expected to improve habitat for a variety of fish and wildlife.

Since the "no action alternative" does not provide restoration of degraded habitats and improvement of fish and mussel recruitment, there would be no beneficial environmental consequences associated with this alternative. Negative environmental consequences would involve the impact of oil-contaminated sediments on the recovery of endangered mussels and other injured natural resources compounded with other activities currently occurring in the watershed that are having adverse impacts on the Fish Creek flora and fauna.

Implementation of the in-stream remediation alternative would result in positive environmental benefits through the removal of contaminated sediment from the stream substrate. However, it would result in direct negative impacts to stream bed-associated fauna by killing, harassing, and harming endangered species and destroying their physical habitat.

CHAPTER 5. PUBLIC INVOLVEMENT

This document was provided to the public for a 41-day review and comment period. In addition to news releases regarding the availability of the draft document to several news media in Indiana and Ohio and a Federal Register Notice dated November 6, 1996, copies of the draft document were sent to interested agencies, organizations and public representatives. A public information meeting addressing the Environmental Assessment and Restoration Plan was also held November 14, 1996, in Edgerton, Ohio. Following the public review period, the trustees determined that there was a "Finding of No Signficant Impact" associated with the selected restoration. A summary of all public comments and the trustees' responses are provided in Chapter 8 of this document.

CHAPTER 6. REFERENCES

A. *LITERATURE CITED*

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CHAPTER 7. LIST OF PREPARERS

This document was drafted by Cindy Chaffee of the U.S. Fish and Wildlife Service's Bloomington, Indiana, Field Office, in coordination with the trustee council. The trustees developed the alternatives and participated in the subsequent preparation of the environmental document. Document reviews and ideas for restoration alternatives were also provided by interested persons. Cost-share contacts will be invited to submit cost-share proposals to the trustee council for consideration.

A. TRUSTEE COUNCIL REPRESENTATIVES

Wayne Faatz	IDNR, Indianapolis, IN
Tim Shearer	ODNR, Columbus, OH
Jim Smith	IDEM, Indianapolis, IN
Scott Sobiech Cindy Chaffee	FWS, Bloomington, IN Field Office - Lead Administrative Trustee Representatives
Vanessa Steigerwald	OEPA, Columbus, OH

CHAPTER 8. RESPONSE TO PUBLIC COMMENTS RECEIVED DURING THE PUBLIC REVIEW AND COMMENT PERIOD OF THE DRAFT JOINT ENVIRONMENTAL ASSESSMENT AND RESTORATION PLAN FOR THE FISH CREEK #2 DIESEL FUEL SPILL

**Copies of the written comments are available upon request.*

1. Comment: The U.S. Geological Survey (USGS) expresses their interest in the involvement in the recovery plan and subsequent activities (e.g. hydrologic studies, chemical quality of fish tissue and benthic sediments, status of algae, macroinvertebrate communities, fish communities, groundwater studies). (*Submitted by*: USGS, Columbus, OH)

Response: The trustee council will consider proposals for activities that enhance the restoration, rehabilitation, replacement, or acquisition of equivalent resources injured by the Fish Creek diesel fuel spill that are consistent with the intent of the Fish Creek Restoration Plan. Detailed proposals including cost-sharing information may be submitted for trustee council consideration by mailing to:

Fish Creek Restoration Proposal
U.S. Fish and Wildlife Service
620 South Walker Street
Bloomington, Indiana 47403

Contact: Cindy Chaffee/Scott Sobiech
(812) 334-4261 ext. 216 or 218

2. Comment: The mechanical barriers need to be more clearly defined. (*Submitted by*: The Nature Conservancy [TNC] on behalf of a Fish Creek Advisory Group)

Response: The mechanical barriers in the restoration plan refer to types of non- point source control and best management practices that may be improved at construction sites within the watershed to minimize the erosion potential at the sites. These may include, but are not limited to, temporary diversions, silt fencing, and straw bale filters. These practices are described in the Indiana Drainage Handbook, An Administrative and Technical Guide for Activities within Indiana Streams and Ditches as practices 104, 105, and 106, respectively. The final plan was modified to reflect this comment. The intent of mechanical barriers has been clarified under "Proposed Activities" on page 2-4 of the final plan.

3. Comment: Other strategies that need to be added to further enhance water quality improvement strategies include:

1) stabilizing streambank erosion on several regulated drains and Fish Creek,

Response: The final plan was modified to reflect this comment. Stabilizing streambank erosion has been added as a project strategy for water quality improvement on page 2-4 of

the plan. In addition to being aware of potential federal and state permit requirements, anyone that proposes to dredge regulated drains or streams in the watershed should consult with the restoration committee to minimize any potential impacts to the Fish Creek aquatic fauna.

2) removing log jams that are causing severe erosion,

Response: The trustees believe that this should be addressed on a case-by-case basis. It is not identified as a general water quality strategy in the final plan.

3) promotion of hay production and livestock promotion to keep sensitive CRP lands covered with vegetation,

Response: Promotion of non-row crop agriculture has been added as a potential project strategy under water quality improvement on page 2-4 of the final plan. The trustees do not see a direct connection between the promotion of livestock production and restoration of the injuries to Fish Creek as a result of the oil spill. Therefore, it is not included in the final plan, however, if the Fish Creek advisory group believes this to be vital for the preservation of Fish Creek, perhaps it could be adopted as a strategy to be implemented by the Fish Creek project partners and/or supported by the Soil and Water Conservation Districts independent of the Fish Creek restoration plan.

4) enhance wetland restoration by completing an inventory of potential sites in the watershed,

Response: This task will be implemented as part of the wetland restoration strategy. Existing wetlands, prior-converted wetlands, soil map information, etc., will be entered into a Geographical Information System (GIS) to allow for layers of data that will aid the trustees in prioritizing restoration sites and monitoring the success of the Fish Creek restoration on water quality and biodiversity.

5) work with farmers to demonstrate new equipment for conservation tillage and to promote strip tillage.

Response: Proposed activity #6 on page 2-4 of the plan provides for the potential to implement this task:

> "...(6) promoting the use of BMPs for construction, development, and farming activities occurring in the watershed."

These strategies need to be implemented at a local level using The Nature Conservancy's (TNC) Fish Creek Office and the local Soil & Water Conservation Districts (SWCD). (*Submitted by*: TNC on behalf of the Fish Creek advisory group)

Response: We encourage the TNC and local SWCDs to continue to play an integral role in the Fish Creek restoration, and that this role will develop as the restoration process continues. However, pursuant to federal law, the decision making function with regard to this restoration plan must rest with the trustees. Furthermore, state and federal regulations may require bidding and other work competition factors that are in the best interest of the public.

4. Comment: The advisory group would like to explore ways to leverage funds for land purchases, for example, if land is purchased, restore it

with conservation practices then resell it with conservation restrictions. (*Submitted by*: TNC on behalf of the Fish Creek advisory group)

Response: This is addressed under proposed activities on page 2-6 of the plan:

> "Additionally, acquisition and resale of lands with the addition of protective land use covenants to the title of ownership will be considered."

Furthermore, the trustee council encourages the advisory group to continue to explore other opportunities that will aid in achieving the Fish Creek project partners' Strategic Plan as well as compliment this restoration plan.

5. **Comment:** Purchasing 30-50 year easements rather than permanent easements may be more acceptable to local landowners. (*Submitted by*: TNC on behalf of the Fish Creek advisory group)

Response: Because the freshwater mussel species are relatively long-living species (some up to 100 years) the trustees' highest priority is for long-term protection of the watershed, however, if long-term options are not feasible, the plan allows for other alternatives.

6. **Comment:** If land is purchased, turn it into a community park for local people to enjoy. (*Submitted by*: TNC on behalf of the Fish Creek advisory group)

Response: The trustees will consider several types of land use, which could include a community park. However, the intent of this restoration plan is to recover injured rare aquatic fauna. Therefore, long term protection from bank and soil erosion, improvement and maintenance of high water quality, and preservation of Fish Creek's rare fauna are of highest priority.

7. **Comment:** If land is purchased or easements obtained, allow the purchasing and ownership of the land or easement to be controlled by a local group. (*Submitted by:* TNC on behalf of the Fish Creek advisory group)

Response: The trustees will consider this option, and others, where they comply with state statutes. However, enforcement of easements will be a major consideration for the trustees.

8. **Comment:** A Geographic Information System (GIS) is in place for the watershed; a new system would be a duplication. (*Submitted by:* TNC on behalf of the Fish Creek advisory group)

Response: The trustees have a legal responsibility to assure that the restoration activities implemented address injuries from the spill. A GIS system that is maintained by the co-trustees for this purpose is necessary in order to monitor the restoration activities and the effectiveness of these activities. There is an extensive amount of Fish Creek data to be entered including information for potential restoration areas, prioritizing restoration areas, water quality data, biological data, etc. To our knowledge, there is not a GIS system that has the necessary current availability for this data entry and information output nor that has the constant accessibility that will be required for

this project. The trustees will acquire and share any GIS compatible data that exists for Fish Creek.

9. Comment: Community relations funding could enhance the local public outreach and education if granted to the SWCDs and TNC. (*Submitted by:* TNC on behalf of the Fish Creek advisory group)

Response: The proposed activities on page 2-7 of the plan alludes to the intent of the community relations project strategies:

> "...(1) the history and status of the Fish Creek diesel fuel spill; (2) general freshwater mussel biological information; (3) the significance and requirements of the species in Fish Creek; (4) preservation management strategies; and (5) the roles of trustee agencies and others involved in the restoration of Fish Creek."

The outreach objective that the SWCDs and TNC have may slightly differ from the outreach objective of the restoration plan. However, where there is opportunity, the trustees would welcome any assistance from the SWCDs and TNC in achieving the plan's outreach objectives.

10. Comment: An additional educational tool would be to put signs up recognizing landowners and the practices implemented on their properties. (*Submitted by:* TNC on behalf of the Fish Creek advisory group)

Response: This is an excellent suggestion. The trustees will leave this option open for those who may be interested.

11. Comment: The restoration committee should include the Fish Creek advisory group that includes area farmers/landowners, local SWCD representatives, and local agencies and organization representatives. (*Submitted by:* TNC on behalf of the advisory group) The restoration committee the trustees have proposed should include TNC. (*Submitted by:* Larry Gilbert, Steuben County Surveyor)

Response: We encourage the TNC, local SWCDs, and the Fish Creek advisory group to play an integral role in the Fish Creek restoration, and that this role will develop as the restoration process continues. However, pursuant to federal law, the decision making function with regard to this restoration plan must rest with the trustees.

12. Comment: The local advisory group should implement the Fish Creek Water Quality Improvement, Riparian Corridor Protection and Community Relations sections of the Restoration Plan for the Fish Creek #2 Diesel Fuel Spill. (*Submitted by:* TNC on behalf of the Fish Creek advisory group and Steve Graber, Dekalb SWCD)

Response: See response to #11.

13. Comment: Setting aside some of the settlement funds into some type of endowment would help to insure the continued protection of Fish Creek. (*Submitted by:* TNC on behalf of the Advisory Group; Steve Graber, Delkalb SWCD; and Larry Gilbert, Steuben County Surveyor)

Response: The restoration plan encompasses a minimum of 16 years. The trustees will invest in long-term financial arrangements that

provide access to, as well as optimal return on investments.

14. Comment: $50,000 for community outreach is too much. (*Submitted by:* TNC on behalf of the advisory group)

Response: Less than 2% of the total restoration costs are going towards community outreach. The trustees believe that this is a vital component to the recovery of Fish Creek endangered mussels and it includes, among other outreach activities, the cost of freshwater mussel education posters and an interpretive video that will be provided to the public.

15. Comment: Propose using the money available to protect the Fish Creek area without trying to do any enhancement by bringing in other species that have not been discovered in Fish Creek previously . (*Submitted by:* Robert Koerner)

Response: The trustees are not proposing to introduce species into the watershed that do not currently reside in Fish Creek. The restoration plan includes a potential activity to enhance species by supplementing populations with additional individuals to bring the populations to pre-spill levels and/or to levels where natural reproduction may occur.

16. Comment: Recommend incentives for fencing the livestock away from the creek and more tree planting in the flood plain and the adjacent slope areas. Keep working with farmers in the watershed to improve their soil conservation practices that will continue to enhance the water quality of the watershed. (*Submitted by:* Robert Koerner)

Response: This activity is provided for in the plan under proposed activities for water quality improvement on page 2-4. Incentives to landowners for fencing may include funding or cost sharing for fence construction, tree planting, and alternative livestock watering sources.

17. Comment: Nowhere in the draft report is there information on what the pipeline companies spent to contain the spill to keep it from polluting the stream in the first place. (*Submitted by:* Robert Koerner)

Response: The pipeline companies have been given the opportunity to provide this information. If the information is received by the trustees before the plan is released as final, it will be included in the final version.

18. Comment: The Restoration Plan is interesting and complete. (*Submitted by:* Ralph Krill, village councilman)

19: Comment: There should have been a verbal presentation with a question and answer period at the public informational meeting. (*Submitted by:* Ralph Krill, village councilman)

Response: Since the intent of the public informational meeting was to provide information and to answer as many of the public's questions as possible, the trustees believed that providing individual stations for each component of the restoration plan was the most efficient way to achieve that goal. This was especially important considering the fact that many people are uncomfortable

speaking before groups. Several individuals, including representatives from each trustee agency, were present to answer any questions the public may have had. However, any future public meetings that may be held regarding the restoration of Fish Creek will include an opening verbal presentation.

20. Comment: Please give consideration to drainage problems in Fish Creek upstream of Ball Lake. (*Submitted by:* Ronald Matthews, Ball Lake Landowners Association Chairman of the Lake Fishing Committee)

Response: The restoration plan considers the entire Fish Creek watershed.

21. Comment: If there is any fish stocking to be done in Fish Creek, please talk to Neil Ledet of the IDNR office in Orland, Indiana. (*Submitted by:* Ronald Matthews, Ball Lake Fishing Committee Chairman)

Response: If the trustees implement any fish stocking activities, Neil Ledet, as well as other agency personnel that are familiar with the watershed, will be consulted.

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Division of Emergency and Remedial Response
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Date: 3/31/97

David T. Herbst
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Deputy Director
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Date: 2-25-97

David Hudak
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U.S. Fish and Wildlife Service
Department of the Interior

Date: 12 March 1997

John Rose
John Rose
Assistant Commissioner
Indiana Department of Environmental Management

Date: 2-25-97