Appendix F

USFWS

*Prescribed fire is an important management tool for a variety of habitats.*

# Fire Management Plan

# WILDLAND FIRE MANAGEMENT PLAN
## John Heinz National Wildlife Refuge at Tinicum

Prepared by: Brendalee Phillips — 1/20/2006
Brendalee Phillips — Date
Refuge Biologist
John Heinz National Wildlife Refuge at Tinicum

2/15/2006
Michael G Durfee — Date
Zone Fire Management Officer – Wallkill River NWR
Region 5 Central Zone, US Fish and Wildlife Service

Concurred by: for — 1/20/2006
Kate McManus — Date
Refuge Manager
John Heinz National Wildlife Refuge at Tinicum

3/13/2006
Allen Carter — Date
Fire Management Branch Chief – Region 5
Northeast Region, US Fish and Wildlife Service

3-24-06 3/27/06
Susan McMahon — Date
Deputy Chief, National Wildlife Refuge System
Northeast Region, US Fish and Wildlife Service

Approved by: — 3-29-06
Marvin Moriarty (ACTING) — Date
Regional Director
Northeast Region, US Fish and Wildlife Service

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## I. Introduction

A. Need and Reason for the Plan

The Department of the Interior (Department, DOI) fire management policy requires that all refuges with vegetation that can sustain fire must have a Fire Management Plan (FMP) that details fire management guidelines for operational procedures and values to be protected / enhanced. The FMP for John Heinz National Wildlife Refuge (NWR, refuge) at Tinicum will provide guidance on preparedness, wildland fire suppression, fire prevention, and interface and fuels management. Values to be considered in the FMP include: protection of visiting public, refuge properties, structures and improvements, cultural and historical sites, protection of neighboring private properties, protection of endangered / threatened / and species of concern, and enhancement of refuge habitats. The FMP will be reviewed periodically to ensure the fire program advances and evolves with the U.S. Fish and Wildlife Service (Service, USFWS) and John Heinz NWR at Tinicum mission.

B. Fire Management Plan as related to Refuge Management Objectives.

- Uncontrolled wildfire has the potential for negative impacts (out of season, wind events, fire trespass, destruction of real property, burning onto neighboring properties, diminished visibility on bordering Philadelphia International Airport and Interstate Highway 95 (smoke cover may endanger aircraft and vehicular traffic)).
- Nonfire treatments are an important tool for reducing hazardous fuels in the urban interface while restoring and maintaining refuge habitats. It also affords the opportunity to interpret the treatments to the visitors to the refuge.
- The majority of hazardous fuels on the refuge are invasive species; nonfire treatments, along with other tools of an Integrated Management Plan, will reduce invasive species and make areas available for growth of native vegetation and/or possible restoration.
- In existing restoration areas on the refuge, removal of the invasive species *Phragmites austrialis*, has allowed State-listed species of concern to recur, including *Cyperus engelmannii, Pluchea odorata, Echinochloa walteri, Zizania aquatica*, and *Sagittaria calycina.*
- Interpretive displays can be set up to inform the general public of the threats from invasive species and the treatments being used to control them.

C. Annual Fire Management Plan Review

The refuge manager will review the FMP annually to determine if additions, deletions, or changes warrant reapproval of the plan.

Upon completion of the CCP and Habitat Management Plan (HMP), the FMP will be reviewed to determine if any goals, objectives, or strategies need to be revised in light of the decisions resulting from the HMP process.

D. NEPA Compliance.

This initial FMP for John Heinz NWR addresses protection from wildfire through preparedness, suppression actions, and nonfire fuel treatments. Wildland fire is an unplanned event and as such, involves no decision for public input on environmental effects. Nonfire fuel treatments are addressed in other management plans and documents. This plan qualifies for a Categorical Exclusion under the National Environmental Policy Act (NEPA). The plan is not anticipated to individually or cumulatively have significant adverse impacts on the environment. Activities above are included in the Services actions designated as NEPA categorical exclusions in 516 DM 6 Appendix 1, 1.4 B. (5) and would not be exceptions to categorical exclusions (516 DM 2, Appendix 2). This plan also meets requirements of the National Historic Preservation Act and the Endangered Species Act.

The bald eagle is the only known federally listed threatened or endangered species which occurs on the refuge. The bald eagle does not nest on the refuge but does feed in the refuge impoundment and marshes throughout the year. When the refuge initiates a fire management activity, it will comply with Section 7 requirements (Appendix A).

Staff will continue to consult with the Service's Regional Historic Preservation Office (RHPO) and State Historic Preservation Officer (SHPO) in identifying sensitive cultural resource sites, and ensuring that known or suspected sites are not disrupted.

E. Collaborative Opportunities.

Development of the FMP has been a collaborative process with Federal, State, and local partners including the Service, PA Department of Conservation and Natural Resources, Bureau of Forestry, and various local fire departments. Partner involvement will continue to be critical to implementing successful wildland fire prevention, suppression, and other nonfire fuels treatments.

F. Authority and Guidance.

- Protection Act of September 20, 1922 (42 Stat. 857; 16 U.S.C.594): authorizes the Secretary of the Interior to protect from fire, lands under the jurisdiction of the Department directly or in cooperation with other Federal agencies, states, or owners of timber.
- Economy Act of June 30, 1932: authorizes contracts for services with other Federal agencies.
- Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66, 67; 42 U.S.C. 1856, 1856a and b): authorizes reciprocal fire protection agreements with any fire organization for mutual aid with or without reimbursement and allows for emergency assistance in the vicinity of agency lands in suppressing fires when no agreement exists.
- Disaster Relief Act of May 22, 1974 (88 Stat. 143; 42 U.S.C. 5121): authorizes Federal agencies to assist state and local governments during emergency or major disaster by direction of the President.

- National Wildlife Refuge System Administrative Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd et seq.: defines the National Wildlife Refuge System as including wildlife refuges, areas for the protection, and conservation of fish and wildlife which are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas. It also establishes a conservation mission for the Refuge System, defines guiding principles, and directs the Secretary of the Interior to ensure that biological integrity and environmental health of the system are maintained and that growth of the system supports the mission.
- Federal Fire Prevention and Control Act of October 29, 1974 (88 Stat. 1535; 15 U.S.C.2201): provides for reimbursement to state or local fire services for costs of firefighting on Federal property.
- Wildfire Suppression Assistance Act of 1989. (Pub.L. 100-428, as amended by Pub.L 101- 11, April 7, 1989).
- Departmental Manual, Part 620 DM Chapter 1, Wildland Fire Management General Policy and Procedures (April 10, 1998): defines Department of Interior Fire Management Policies.
- National Environmental Policy Act of 1969: regulations implementing NEPA encourages the combination of environmental comments with other agency documents to reduce duplication and paperwork (40 CFR 1500.4(o) and 1506.4).
- Clean Air Act (42 United State Code (USO) 7401 et seq.): requires states to attain and maintain the national ambient air quality standards adopted to protect health and welfare. This encourages states to implement smoke management programs to mitigate the public health and welfare impacts of wildland and prescribed fires managed for resource benefit.
- Endangered Species Act of 1973.
- Federal Fire policy of 1995.

## II. Relationship to Refuge Management Planning/Fire Policy

A. Agency Policy

The U.S. Fish and Wildlife Service fire policy is tiered to 620 DM 1 of the Departmental Manual (April 1998) and is contained in 621 FW 1 of the Service Manual (February 2000) and the Fire Management Handbook. The following key points summarize the information contained in these manuals:

- Firefighter and public safety is the first priority of the Fire Management Program.
- Only trained and qualified people will conduct fire management duties.
- Trained and certified employees will participate in the wildland fire management program as the situation demands. Agency administrators are responsible and accountable, and will make employees available to participate in the program.
- Fire management activities will be conducted on an interagency basis with the involvement of all partners when appropriate.
- An approved FMP must be in place for all of our lands with burnable vegetation.

- We will integrate fire as an ecological process into resource management plans and activities on a landscape scale, across bureau boundaries, based on the best available science.
- We will use wildland fire to meet identified resource management objectives when appropriate and the FMP contains such direction.
- We will employ prescribed fire whenever it is an appropriate tool for managing our resources, and will protect against unwanted wildland fire whenever it threatens human life, property, and natural or cultural resources. Once we commit people to an incident, these human resources become the highest value we protect. If we must prioritize between property and natural or cultural resources, we will base the decision on relative protection values, commensurate with fire management costs.
- Regions will provide safe, cost-effective fire management programs in support of land, natural, and cultural resource management plans through appropriate planning, staffing, training, and equipment.
- Management actions we take on wildland fires will consider firefighter and public safety, be cost effective, consider benefits and protection values, and be consistent with natural and cultural resource objectives.

B. Relationship of FMP to Enabling Legislation and Purpose

Under Public Law 92-326 (86 Stat. 392), passed by Congress in June,1972, authorization was given to the Secretary of the Interior to acquire 1,200 acres to establish the Tinicum National Environmental Center to be administered as a unit of the National Wildlife Refuge System. In November 1991, the name of the refuge was changed to John Heinz National Wildlife Refuge at Tinicum to honor the late Senator who helped preserve Tinicum Marsh. The refuge currently holds title to a little over 993 of the authorized 1,200 acres (Figure 1).

John Heinz NWR at Tinicum was established to preserve and restore the natural resources of Tinicum Marsh, which represents the largest freshwater tidal marsh that remains in Pennsylvania. It is an urban wildlife refuge located in southeastern Pennsylvania within Delaware County and the City and County of Philadelphia (Figure 2). The areas surrounding the refuge are highly urbanized and include Philadelphia International Airport and industrial, commercial, and residential areas. Over the years, the refuge has been a resting and feeding area for more than 300 species of birds, 80 of which nest on the refuge. Fox, deer, muskrat, turtles, fish, frogs, and a wide variety of wildflowers and other plants also call the refuge "home." The refuge is a designated Important Bird Area and an Important Mammal Area. The refuge adjoins or includes portions of six municipalities within Delaware County - Tinicum Township, Ridley Township, Borough of Prospect Park, Borough of Norwood, Borough of Folcroft, and Darby Township.

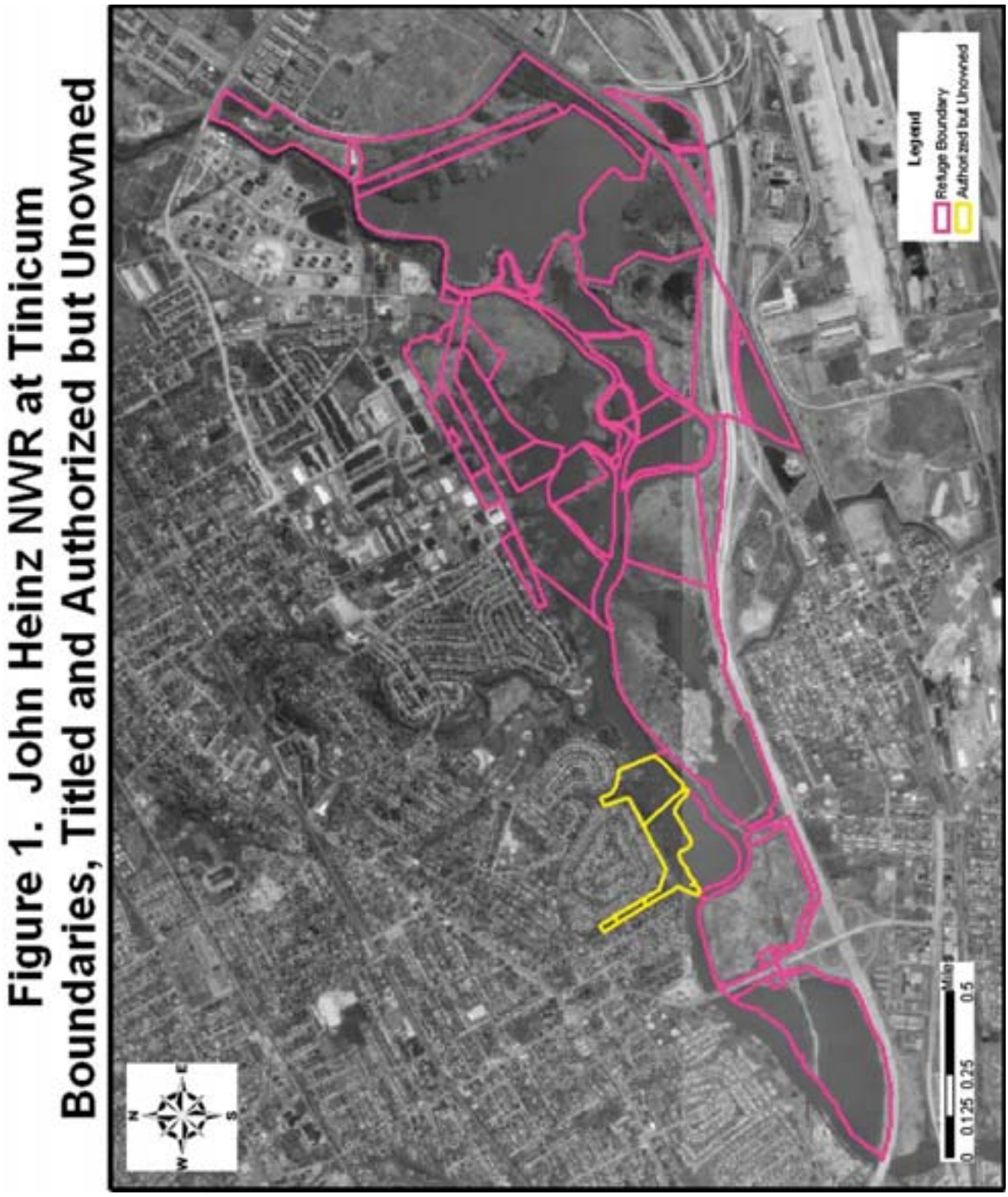
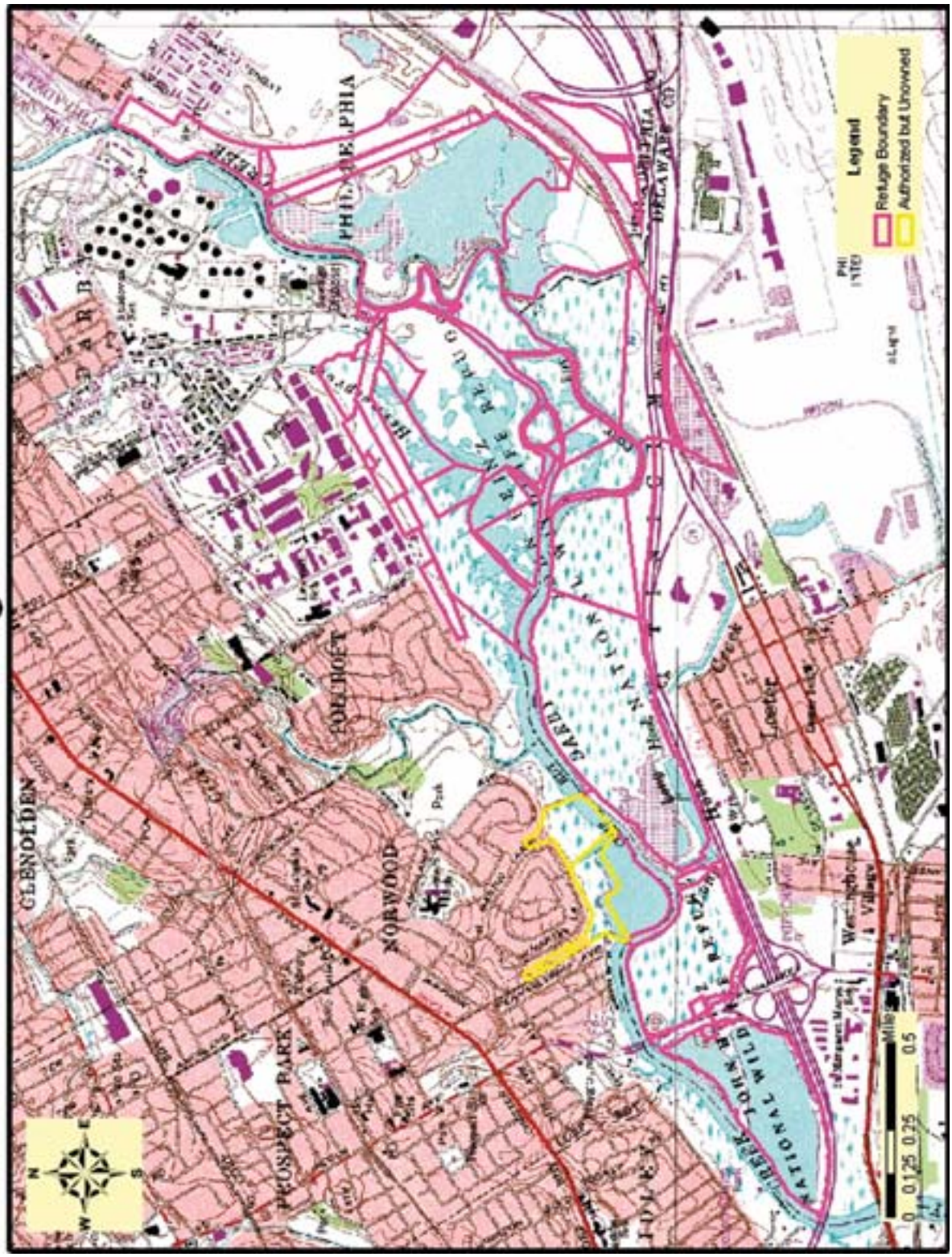


Figure 1. John Heinz NWR at Tinicum
Boundaries, Titled and Authorized but Unowned
Legend
Refuge Boundary
Authorized but Unowned
N
E
S
W
0 0.125 0.25 0.5
Miles

Figure 2. John Heinz NWR at Tinicum and surrounding communities



C. Significant Resources and Values

John Heinz NWR at Tinicum was established to preserve and restore the remaining 200 acres of Tinicum Marsh and its associated habitats. Tinicum Marsh is the largest remaining freshwater tidal marsh in Pennsylvania. Its location on the Atlantic flyway makes it important to migrating waterfowl and shorebirds.

Cusano Environmental Education Center, which opened in January 2001, is a multi-million dollar "green" building that has won numerous awards for its' design. The mission of the Cusano Environmental Education Center is to demonstrate, within an urban setting, the importance of the natural world to the human quality of life and inspire visitors to become responsible stewards of the environment. The Center features a resource library, classrooms for study, public meeting space, and exhibits on Tinicum Marsh, wetlands, watersheds, citizen action, and the Service. The Center is visited by over 6,000 school children and other visitors annually.

D. Other Management Plans

The refuge's 1980 master plan implemented the goals and objectives of habitat restoration, habitat enhancement, and environmental education.

E. Refuge Goals

The Service, to fulfill the intent of Congress and in keeping with its overall mission for the National Wildlife Refuge System, have recognized three major purposes of John Heinz NWR:

- To preserve and restore the natural resources of the Tinicum Marsh, which represents the largest freshwater tidal marsh that remains in Pennsylvania.
- To provide environmental education opportunities for the schools and residents of the surrounding region.
- To provide quality wildlife-oriented recreation opportunities for the enjoyment of people in the surrounding region when it will not interfere with the primary purpose for which the area was established.

## III. Wildland Fire Management Strategies

A. General Management Considerations

1. 10-Year Comprehensive Strategy

The National Fire Plan identifies the three core principles of collaboration, priority setting, and accountability. This plan addresses these principles in the following manner:

a. Collaboration –
John Heinz NWR is surrounded by the wildland urban interface which requires a collaborative approach at all levels to achieve the goals of the fire management program. The refuge recognizes that the key to successful fire management activities (suppression and prevention) lies with the surrounding fire departments. The fire departments provide the closest forces capable of responding safely to a wildland fire incident, since the refuge itself does not maintain an initial attack suppression force. The refuge and the region will continue to support and foster these relationships by encouraging collaborative meetings for training and information sharing, and requesting their input into the fire management decisionmaking process.

Fire suppression for the refuge is covered under several cooperative agreements (Appendix B).

The Service agrees to delegate responsibility and authority of incident commander to the fire departments, in consultation with the refuge designated resource advisor, to suppress wildland fires on John Heinz NWR lands. The Service agrees to reimburse the departments for suppression costs based on a rate schedule agreed to on an annual basis. The cooperative agreement is effective for five years from date of signing.

Surrounding fire departments that provide for the suppression of all wildland fires at John Heinz NWR:

| **Fire Department or District** | **Agreement** | **Date** |
|---|---|---|
| PA Bureau of Forestry, Division of Forest Fire Protection, District 17, Valley Forge | | |
| City of Philadelphia Fire Department | X | 02/25/2005 |
| Borough of Prospect Park Fire Department | X | 07/02/2004 |
| Borough of Norwood Fire Department | X | 07/20/2004 |
| Borough of Folcroft Fire Department | X | 06/28/2004 |
| Tinicum Township<br>○ Essington Fire Department<br>○ Lester Fire Department | <br>X<br>X | <br>07/12/2004<br>07/06/2004 |

The refuge has separate signed agreements with each fire department listed above.

b. Priority Setting –
Emphasis of the fire management program will be protection of human life and property, specifically the local community. Other priorities include the following:

- Protection of watersheds, such as the various tributaries of the Delaware River, from the undesirable effects of wildland fire
- Hazard fuel treatments to reduce fire prone invasive vegetation and maintenance of roads and trails for equipment access
- Wildland fire prevention and education programs

c. Accountability –
Establish uniform and cost-effective measures, standards, reporting processes, and budget information in implementation plans that will fold into the Government Performance and Results Act (GPRA) process. The primary GPRA performance measure relevant here is to control 95 percent of unplanned and unwanted wildland fires during initial attack.

2. Safety

The refuge manager and zone Fire Management Officer (FMO) will ensure that all fire management actions and activities are completed with safety being the first priority.

3. Endangered Species Act

Wildland fire size-up and nonfire treatments would include an assessment of the threat to State-listed and federally listed endangered, threatened, and special concern species and their habitats. Any planned activity that could affect listed or threatened species will require a section 7 consultation, unless covered by a previous consultation.

4. Clean Air Act

Prescribed fire is not planned as a management tool for the refuge, thus will be in compliance with all applicable Federal, State, and local air pollution control requirements as specified by Section 118 of the Clean Air Act, as amended in 1990.

5. Clean Water Act

Fire retardants and foams may be used within the guidelines established through the cooperative agreements and delegation of authority. Direct application of these solutions into waterways such as impoundments, inflows, stream channels, or drainage ditches should be avoided. Federal guidelines implemented in June 2000 require that application of retardants and Class A foams be avoided within a 300-foot buffer zone of waterways.

6. National Historic Preservation Act

Wildland fire size-up and nonfire treatments require an assessment of the threat to cultural resources. In the event of a new sensitive resource is discovered during any fire activity, the area will be noted and protected from further disturbance. A report will be made and the proper agencies notified. Any preplanned activities causing significant ground disturbance will have a consultation with the Regional Historic Preservation Office.

B. Wildland Fire Management Goals

The goals of John Heinz NWR fire management program support the interim goals of the refuge as outlined in II.E., and also support the principles outlined in the USDA/DOI National Fire Plan, 10-Year Comprehensive Strategy, and Cohesive Strategy:

- Ensure firefighter and public safety is the highest priority of all fire and fuels management activities.
- Suppress all wildland fires in a safe and cost-effective manner consistent with resources and values at risk.

- Develop and implement a comprehensive nonfire fuels/vegetation management program to reduce hazardous fuels and invasive species.
- Protect sensitive biological communities from the effects of wildfire.
- Utilize Minimum Impact Suppression Tactics (MIST) whenever feasible, commensurate with firefighter safety and resources to be protected to minimize opportunities for invasive species introductions when utilizing heavy equipment on wildfires, or when assessing rehabilitation and restoration needs following wildfire occurrence.
- Collaborate with local, State, and Federal partners when planning and implementing wildland fire preparedness, prevention, and suppression actions.
- Educate employees and the public about the scope and effect of wildland fire management, including fuels management, resource protection, prevention, hazard/risk assessment, mitigation and rehabilitation, and fire's role in ecosystem management.
- Identify fire management research needs, work with partners to develop proposals and obtain funding, and apply research results to fire planning through the adaptive management process.

C. Wildland Fire Management Options

Normally a fully-evolved fire management program on Department of Interior lands includes a variety of options for dealing with wildland fire:

- Wildland Fire – Full Suppression.
- Wildland Fire Use - Allow fire to assume its natural role in a fire-adapted ecosystem or to achieve resource benefits.
- Prescribed Fire - Intentionally igniting fire under carefully controlled conditions and according to an approved plan, to achieve a management objective.
- Hazard Fuels Reduction - Reduction of fuel accumulations around structures or other values at risk by mechanical, herbicide, or fire means.

The fire management program at John Heinz NWR will employ the following management options:

- Wildland Fire – Full suppression.
- Hazard Fuels Reduction - Reduction of fuel accumulations around structures or other values at risk by mechanical, herbicide, or fire means.

Associated actions needed to take effective wildland fire suppression include: preparedness, prevention, and operational planning meetings with cooperators. These will be discussed in some detail later in the plan.

Prescribed fire and wildland fire use are not considered an appropriate fire management option at John Heinz NWR due to the wildland urban interface issues associated with the Philadelphia Metropolitan Area, limited smoke management options, and low frequency of natural caused fire.

D. Wildland Fire Management Objectives and Strategies by Fire Management Unit

1. Fire Management Units

John Heinz at Tinicum NWR will be considered as one Fire Management Unit (FMU) based on size, common fuel types, expected fire behavior, suppression strategies, and management objectives. The refuge is identified as a component of the PA Fire Planning Unit (FPU) which includes all Service, National Park Service, and Forest Service land in PA used for the Fire Program Analysis (FPA).

2. Objectives

- Reduce hazardous fuel loads in the wildland urban interface through available mechanical, chemical, or biological means.
- All fires will be managed as wildland fires.
- Strive to contain 95 percent of all fires during the initial attack phase at one acre or less with no firefighter or public injuries.
- Acquire resources for a maximum response time of one half hour from time fire is reported.
- Employ MIST when possible, with special consideration given to protecting sensitive habitat and biological communities from suppression activities and fire encroachment.
- Prepare and implement an effective fire prevention plan to minimize fires and prevent human-caused wildland fires
- Prepare and present programs to educate the public regarding fire management practices and prevention within the refuge and Refuge Systemwide.

3. Strategies

- Conduct all fire management programs in a manner consistent with applicable laws, policies and regulations.
- The incident commander, working in collaboration with the refuge manager or resource advisor, will determine the appropriate level of suppression and tactics to be employed based on considerations of human safety, actual and potential fire behavior, values to be protected, access, and expected suppression costs.
- Maintain cooperative agreements with local paid and volunteer fire departments to promote cooperative prevention and suppression activities. Provide assistance to local or Federal cooperators under the “closest resources” principles in accordance with Service policy.
- Identify areas of concern and develop response plans and tactics to expedite the initial attack and full suppression of the fire.
- MIST tactics will be employed to the maximum extent possible, given the considerations of safety, fire behavior, values, access, and cost.
- Use of dozers, skidders, and other heavy equipment will be undertaken only within the guidelines established through the cooperative agreements and delegation of authority.
- Avoid use of retardants near waterways and wetland areas.

- Develop a fuels treatment plan annually or as needed.
- Use nonfire mechanical methods and/or herbicide treatments in combination to reduce hazardous fuels in the wildland urban interface while protecting and restoring refuge habitats to natural fuel loads and native vegetation.
- Initiate cost-effective monitoring to ensure treatment objectives are being met.
- In collaboration with local and other partners, prepare and implement a fire prevention program to inform the public about wildland fire.
- Integrate fire ecology, management, and prevention themes into existing interpretive and education programs.

4. Fuel/Habitat, Weather, and Fire Behavior Characteristics

a. Fuel/Habitat Types

The generalized vegetation map (Figure 3) and table 1 offers some indication of the National Fire Danger Rating System (NFDRS) fuel models used to estimate potential fire behavior on a more localized scale and corresponding Northern Forest Fire Laboratory (NFFL) fuel models used for fire danger purposes. Particularly for the NFFL fuel models, this discussion is intended only to give a very generalized idea of the type of fire behavior which can be expected; the actual fuel model appropriate for a given acre of ground requires first-hand observation of the conditions present on the scene.

**Table 1: Fuel/Habitat Types – John Heinz at Tinicum National Wildlife Refuge**

| Fuel/Habitat Types | Acres | % |
|---|---|---|
| Tidal Marsh/Tall Grass (NFFL Model 3) | 580 | 59% |
| Short Grasslands (NFFL Model 1) | 101 | 10% |
| Hardwood Forest (NFFL Model 9) | 110 | 11% |
| Open Water/Mudflat | 202 | 20% |
| **Total** | **993** | **100%** |

b. Weather and Climate Patterns

The Delaware River moderates the area's micro-climate, and the Atlantic Ocean influences the overall weather pattern for all of southeastern PA creating a humid, temperate climate. Days below zero degrees and above 100 degrees Fahrenheit are rare. The average frost-free period runs from late April to early October. Precipitation averages about 41 inches annually and snowfall averages about 21 inches. Rainfall is heaviest during July, August, and September. Prevailing winds are from the northwest during the winter and from the southwest during the summer. Annual wind speed averages 9.3 mph with March the windiest month, and July, August, and September the least windy months. Generally, the area's weather diminishes the likelihood of a catastrophic wildfire with its high humidity, moderate rainfall, and relatively calm winds.

c. Fire Season (Occurrence) and Fire Danger Indices

The largest numbers of fires in the general area of John Heinz NWR occur in late fall and spring months (i.e. February through May and October through December). Most of the fires recorded in the DOI Fire Reporting Database occurred in March and April with some occurring in early June. However, there is potential for wildfires year-round. All fires on the refuge have been human caused and adjacent to many of the developed trails or the edge of the refuge. Most fire activity is also found in the *Phragmites* dominated areas of the refuge. All fires have been extinguished by the nearest fire department. The largest fire was in fall 1988 at 17.2 acres in the old landfill section of the refuge (appendix C).

National Fire Danger Rating System (NFDRS) data is compiled by the zone FMO for daily fire danger indices. No historical weather data is available from a refuge NFDRS weather station. Daily fire danger indices will use data compiled and averaged from the NFDRS Weather stations located at Forsythe NWR in New Jersey and Prime Hook NWR in Delaware, then compared to the indices used by the New Jersey State Forest Fire Service. Daily runs of the NFDRS grass fuel models N (sawgrass – tall) and A (annual grass-short) best represent the daily changes in the light flashy fuels due to constantly changing weather conditions. Fire danger severity and long term drought trends are best reflected using NFDRS hardwood fuel models (R and E). Fuel Model R (summer - hardwood forest) is used approximately May 15 to October 15 and Fuel Model E (winter – hardwood forest) is used approximately October 15 to May 15. These calculated indices will be used to determine the daily fire-danger rating.

d. Fire Regime

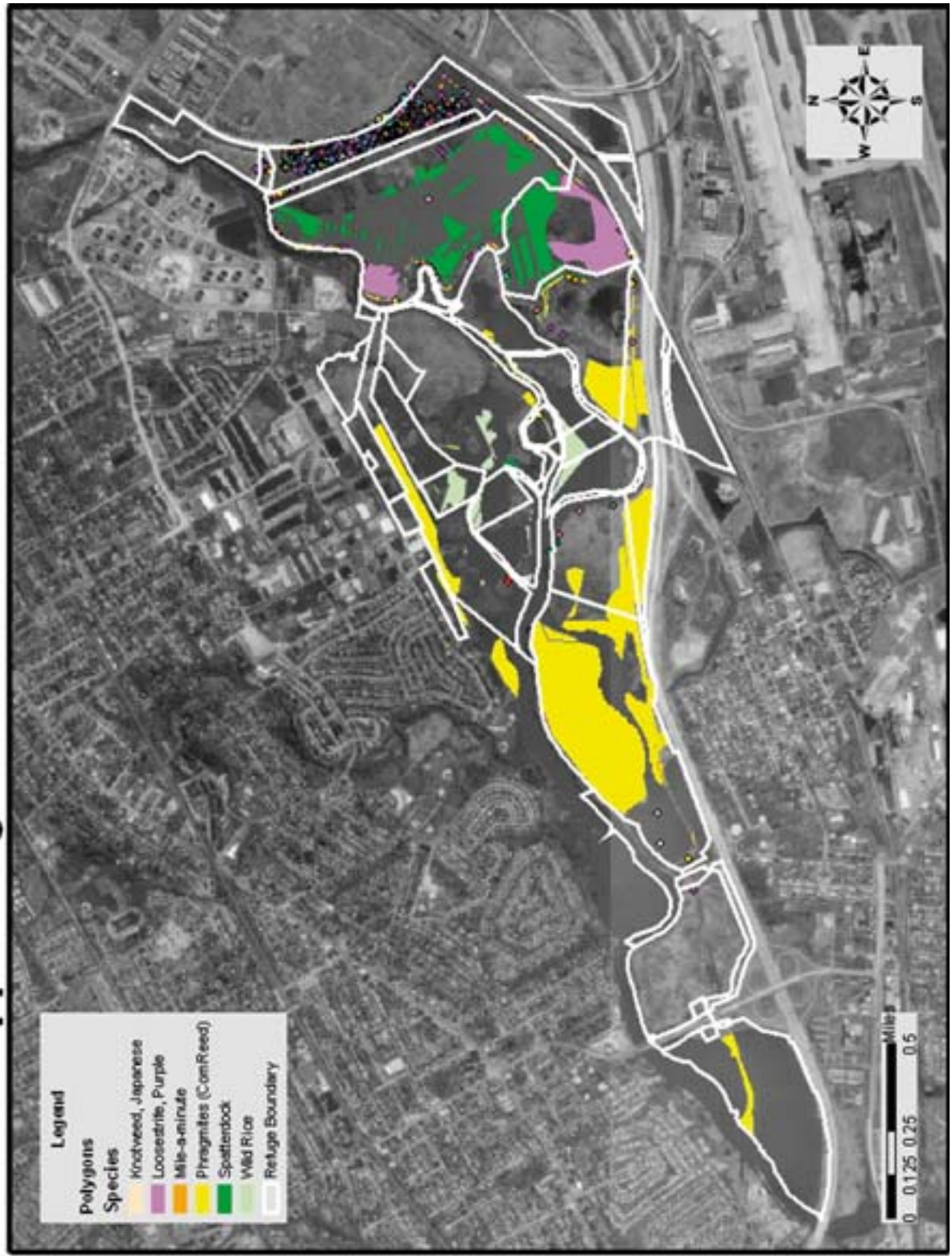
A natural fire regime is a general classification of the role fire would play across a landscape. The five natural (historical) fire regimes are classified based on the average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes include:

- I – 0 to 35 year frequency, low to mixed severity (less than 75 percent overstory replaced)
- II – 0 to 35 year frequency, high severity (greater than 75 percent overstory replaced)
- III – 35 to 100 year frequency, low to mixed severity (less than 75 percent overstory replaced)
- IV – 35 to 100 year frequency, high severity (greater than 75 percent overstory replaced)
- V – 200+ year frequency, high severity (greater than 75 percent overstory replaced)

Using the FIREMONv1.1, Fire Regime and Condition Class Field Procedures-Standard and Scorecard Methods, John Heinz NWR has two fire regime classes:

- For the grass and emergent marsh vegetation, the fire regime is II.
- The hardwood forests have a regime of III.

**Figure 3. John Heinz NWR at Tinicum**
**Mapped Vegetation as of December 2005**



e. Potential Fire Behavior

The following fire behavior outputs are based on the average conditions found during a normal fire season using the 14:00 weather observations. These averages ranges include: temperature – 55 to 70 degrees Fahrenheit, relative humidity – 25 percent to 35 percent, mid-flame wind speed of 6 mph, and 6 percent average 1 hr (less than 1/4 inch diameter) fine dead fuel moisture. The slope is 0 to 2 percent and the rate of spread is for a head fire. The outputs are calculated from the BEHAVE - Fire Behavior Prediction Models algorithms (appendix D).

Fuel Model 3 (N) - Tidal Marsh/Tall Grass: Fires in this model display high rates of spread under the influence of wind. Wind may drive fire into the uppers heights of the grass and across standing water. Stands are tall, averaging about 3 to 6 ft., but considerable variation may occur. Approximately 1/3 or more of the stand is considered dead or cured and maintains the fire. Fuel loading is 3.0 tons/acre and consists of up to ¼ inch 1 and 10 hr dead fuel component. Fire behavior is directly related to the fuel moisture and windspeed. Short-range (up to 200 foot) spotting usually occurs and causes high to extreme control problems. The behavior output includes:

- Rate of Spread – 148.4 chains/hr (1.9 mph)
- Flame Length – 14.9 feet

Fuel Model 1 (A) - Field Grasslands: Fire spread is governed by the fine and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. The fire behavior is directly related to the fuel moisture and windspeed. Fuel loading is 0.74 tons/acre and consists of 1/4 inch or smaller (1 hour) dead fuel component. Spot fires are generally not produced because fuels are consumed too quickly and thoroughly. Resistance to control is low to moderate, depending on windspeed. The behavior output includes:

- Rate of Spread - 135 chains/hour (1.7 mph)
- Flame Length - 5.4 feet

Fuel Model 9 (E/R) - Deciduous Hardwood Forest: Fires are carried by dead, loosely compacted leaves and understory grasses. Wind tumbled leaves and torching trees may cause short to mid-range spotting that may increase the rate of spread above the predicted value. Fuel loading is 3.5 tons/acre and consists of less than 3 inches of dead and live fuel. Fire behavior is directly related to the fuel moisture and fuel loading with windspeed in exposed areas. Resistance to control is moderate except during drought conditions when extreme fire conditions are present. The behavior output includes:

- Rate of Spread – 11.7 chains/hr (0.2 mph)
- Flame Length – 3.4 feet

f. Historic Role of Fire

Pyne (1982) summarizes the evidence for fire in the Northeast and concludes that it is predominantly a phenomenon associated with human activity. Where human-caused fire is common, fire incidence is strongly correlated with population density, so interpreting fire history in the Northeast becomes, to some extent, a matter of interpreting human populations and trends.

One of the establishment objectives of the refuge is to protect the last remnants of the Tinicum Marsh along the Delaware River. The area has had multiple types of disturbance resulting in an altered vegetative complex and fire regimes, behavior, and occurrence.

5. Management Considerations Affecting Operational Implementation

a. Safety

Firefighter and public safety (urban interface) is always of the highest priority when determining suppression strategy and tactics. No natural resource or property value is worth exposing humans to high-risk situations. Fuels in the grasslands are light and flashy (models 3 and 1) and can pose a significant danger and is one factor of fatality fires.

b. Values at Risk

Once human safety is assured, the values to be protected play into the decision of the strategy and tactics to be employed. The most significant values at risk are the adjacent private properties. These properties include an industrial complex (oil tank farm), several light industrial facilities, multiple single and multi family houses, and the Delaware County Emergency Response Training Academy. Other areas or values that would be at risk include Interstate 95 and the Philadelphia Airport, refuge structures and improvements, and wildlife habitat.

c. Protection of Resources

Natural and cultural resources will be protected to the maximum extent feasible, but their protection will not be the highest priority. Appropriate suppression action will first and foremost ensure firefighter and public safety. When no threat to human life or damage to improvements and private property exists, protection of natural and cultural resources from fire or suppression damage will be the next highest priority. Foam suppressants or retardants should not be used within 300 feet of waterways to protect various water related resources. If new natural or cultural resources of concern are discovered during fire suppression activities, the refuge manager/resource advisor will ensure, to the extent appropriate and possible, their protection from damage related to fire-suppression activities. The refuge manager will consult with the regional historic preservation officer to avoid, minimize, or mitigate potential or actual damage to cultural resources.

d. Wildlife

Wildlife will be protected to the maximum extent feasible, but their protection will not be the highest priority. Appropriate suppression action will first and foremost ensure firefighter and public safety. When no threat to human life or damage to improvements and private property exists, protection of natural and cultural resources from fire or suppression damage will be the next highest priority. Once these concerns are protected, wildlife will be protected to the extent possible. Both birds and reptiles nest on the refuge and the areas in which the nests occur will be protected to the extent appropriate and possible. The adult birds would fly away, but the eggs and chicks still in the nests would be vulnerable to fire. Adult and hatchling turtles would most likely be in or near the water resources on the refuge, but again, the eggs in the nests would be vulnerable to the heat from the fire. Nesting for all of these species occurs primarily in spring and summer months. Mammals also breed on the refuge, but they would hopefully be able to move their young out of danger. The refuge manager and wildlife biologist would advise the incident commander of the areas of concern.

e. Minimum Impact Suppression Tactics Guidelines (MIST)

All personnel involved with fire management are expected to have an understanding of minimum impact suppression tactics  Suppression efforts can sometimes cause more resource damage than the actual fire. Efforts to minimize resource damage must be a consideration with all suppression actions and shall be outlined in the cooperative agreements or delegation of authority. As a general rule, the assigned incident commander, with the input from a resource advisor, while minimizing the threat to human life and property, will evaluate the suppression resource needs and seek alternatives to mechanized equipment, limit soil movement, maintain natural water courses, and minimize land degradation. Further guidelines can be found in the Fire Management Handbook, FM 3.2.6.

The resource advisor should be an employee with resource management knowledge to advise the incident commander on issues related to mitigating the affects of suppression operations on cultural and natural resources.

f. Air Quality

Visibility and clean air are valued natural resources for John Heinz NWR and the protection of them will be given full consideration in fire management planning and operations. The station will comply with all applicable Federal, State, and local air pollution control requirements, as specified within Section 118 of the Clean Air Act, as amended (42 USO 7418). Further guidance is in the Services Fire Management Handbook.

John Heinz NWR has not been designated as a Federal area where visibility is an important issue (Federal Class I Area) under the Clean Air Act Amendments of 1977. However, due to the proximity of sensitive and critical smoke areas (i.e. the City of Philadelphia, PA, Interstate 95, and Philadelphia International Airport), smoke management and impacts became the decisive factor for not conducting prescribed burning on the refuge.

g. Access

The refuge has a series of roads and trails that provide vehicular access to most areas of the refuge. Due to the large percentage of wetlands, ground conditions need to be assessed and considered in the initial size-up before sending vehicles off the main roads. Tracked low-ground pressure vehicles or indirect tactics should be considered. Fire department personnel are authorized to use bolt cutters if necessary to remove locks for the purpose of emergency access. (Figure 4)

h. Barriers

Barriers to fire spread exist on the refuge as roads, trails, tidal marsh and wetlands, and fuel type changes (flashy grass to hardwood forest) and can be used effectively to hasten construction of control lines and minimize the impacts of constructed lines. Barriers can also be used effectively for indirect attack, as a safe location to make a stand, or as a secure place to burn out by removing fuels in front of an advancing fire.

i. Cost

The refuge manager, with input from the zone FMO or incident commander, should weigh the relative costs of various suppression and fuel treatment strategies in comparison to values at risk, being sure not to compromise safety concerns. Too many resources on an incident can elevate the costs unnecessarily. Aircraft can be an effective resource under some circumstances, but may also be unnecessary or ineffective in many situations and can greatly escalate the cost of suppression operations. The zone FMO should be consulted prior to the major expenditures of fire operation funds.

Wildland fire suppression actions require a cost code from FIRECODE. Those numbers will be generated by the zone FMO and activated by the Denver Finance Center.

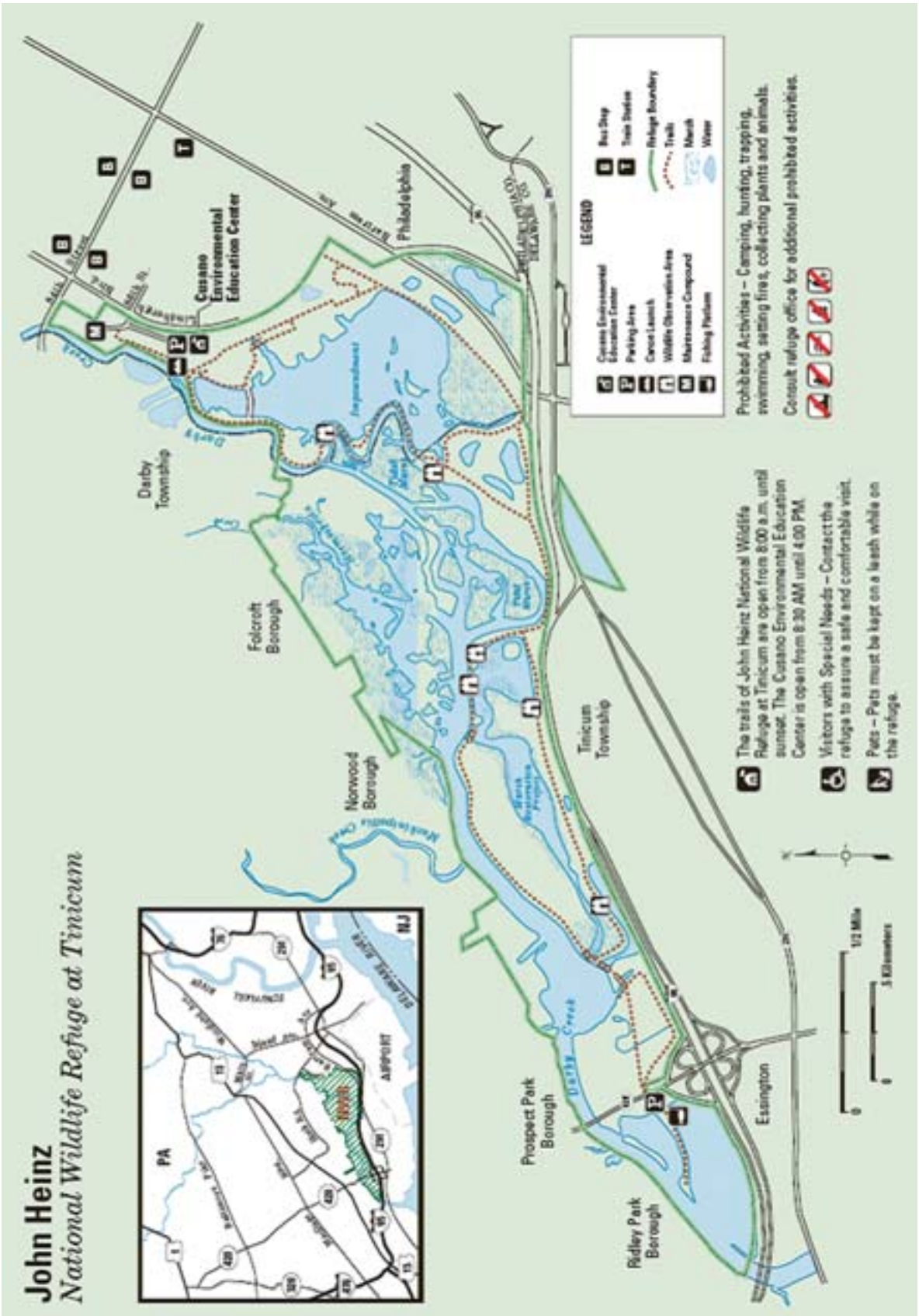
The refuge manager is responsible to assure the costs of all fire operations are properly spent and accounted for through the Federal Financial System (FFS) and Budget Tracking System (BTS) accounting systems. A quarterly expenditure report should be submitted to the zone FMO for tracking and accountability of fire operation funds.

j. Regional and National Concerns

The regional preparedness level tends to follow the national preparedness level unless the eastern seaboard is experiencing very dry conditions and a high potential for wildfire. Expect normal refuge operations to occur through National Preparedness Level IV.

At National Preparedness Level V, when local fire conditions permit, and subject to supervisory approval, all qualified individuals should be made available to meet regional and national needs.

# Figure 4. John Heinz NWR at Tinicum Roads & Trails



## IV. Wildland Fire Management Program Components

The full range of fire management program elements were reviewed and considered when developing this fire management plan. These include wildfire suppression (and with it the associated elements of preparedness, training, prevention, and detection), wildland fire use, prescribed fire, nonfire fuel applications, and emergency rehabilitation and restoration.

As outlined in III.C, John Heinz will implement the following elements:

- Suppression of unwanted wildland fire (wildfire).
- Reduction of fuel accumulations around structures or other values at risk by mechanical, chemical, or fire means (hazard fuels reduction).

A. Wildland Fire Suppression

1. Suppression/appropriate management response.

All fires will be appropriately suppressed. A well-established mutual aid program will be utilized for suppression operations on the refuge with procedures for local responding agencies to report the incident to the refuge manager at the John Heinz NWR office. All suppression efforts will be dictated by the following priorities:

- Life and safety
- Natural resources and property, both refuge and private

Although resource impacts of suppression alternatives should be considered in selecting a fire management strategy, resource benefits will not be the primary consideration. Appropriate suppression action will be taken to ensure firefighter and public safety and protection of the resources.

Suppression strategies should be applied so that the equipment and tools used to meet the desired objectives are those that inflict the least impacts upon the natural and cultural resources. MIST should be considered to protect all resources. Natural and artificial barriers will be used as much as possible for containment. When necessary, fire line construction should be conducted in such a way as to minimize long-term impacts to resources.

Suppression in some of the tidal marsh areas is virtually impossible from the ground. These areas are characterized by patches of marsh vegetation connected by channels and ditches producing an island-like appearance. Some of these islands have small pockets of hardwood forests. Access is the main problem to these areas; they are accessible by boat only at high tide, and virtually inaccessible at low tide. Fire suppression in these areas will occur along the perimeters to protect private property and other improvements and habitat.

2. Preparedness

a. Readiness

The refuge staff should meet with area fire department personnel semi-annually to review cooperative agreements, contact information, and fire suppression policies and procedures. They should meet with the zone FMO yearly to review and update fire management activities, plans, and updated fire program information.

b. Step-Up Actions

Due to the low level of fire occurrence, the lack of historic archived weather data upon which to calculate NFDRS indices and breaking points, the preparation of a site-specific step-up plan is not essential. However, a calculation of NFDRS indices and step-up plan break points is implemented throughout the Central Fire Management Zone (section III D 4 c.)(Appendix E).

c. Detection

Most fires on the refuge will be discovered and reported by local residence and members of the public using the area for recreation. These may or may not be reported directly to the refuge manager; it is expected that often the individual will directly contact 911 or the fire department and refuge staff may not find out about the fire until after suppression actions are completed. Environmental outreach and posted public information efforts should include information on the preferred procedures for reporting wildfires.

d. Communication

Cell phone service within the refuge is good for emergency communications purposes. A refuge radio communication system consisting of several mobile units, portable handhelds, several base stations, and a repeater tower are in place and functioning well. The system is not compatible with local fire department and State radio frequencies as many of the local departments do not wish to have outside users on their frequencies. All efforts will be made to work with the local fire departments to use a compatible form of communications during fire or related operations.

e. Training and Qualifications

The refuge will conform strictly to Service-specific guidelines as well as the National Wildfire Coordinating Group (NWCG) Publication 310-1, "Wildland and Prescribed Fire Qualification System Guide" (January 2000). Service employees participating in any wildland fire activities on Service lands must meet these requirements as well as those for fitness and personal protective equipment (PPE). More information about training, fitness, and PPE is provided in Chapter 1.5 of the Service Fire Management Handbook, and the Central Zone FMO at Wallkill River NWR. Consult with the zone FMO on arranging fire training for refuge staff.

The refuge relies on Philadelphia Metro area fire departments for initial attack response and all department members may not meet NWCG standards. This will not be a limiting factor for the first burning period of initial attack, as Federal agencies have agreed to honor the qualifications standards of assisting entities during this initial phase. Should the fire extend into additional burning periods, then by policy, all suppression personnel will need to meet NWCG standards.

Red card qualification information, such as training records, fire assignments, and physical fitness test results, are maintained through the Incident Qualifications and Certification System (IQCS). The refuge manager will submit updated qualification information annually, which is verified by the zone FMO and entered into the IQCS data base. The zone FMO will maintain a file on fire-qualified refuge personnel; the file should document the training, experience, and qualifications an individual. Each fire qualified individual should maintain a personal qualifications file.

Refuge staff with fireline qualifications must complete an annual Fireline Safety Refresher and meet required fitness level for the position qualified. For red carded fireline personal a fitness rating of arduous (pack test) is required prior to any initial or extended attack action.

f. Prevention

Most fire starts at John Heinz NWR and in the surrounding area are human caused. A documented fire history for the refuge exists in the FMIS database. The refuge has a low fire occurrence, with high to extreme fire potential on old field sites, and in monotypic stands of *Phragmites*. The borders of these areas should contain fire breaks to reduce the potential for wildfires to spread from refuge lands to adjacent private property and structures.

During periods of extreme or prolonged fire danger emergency restrictions regarding refuge operations or area closures may become necessary. Such restrictions, when imposed, will usually be consistent with those implemented by PA Division of Forest Fire Protection and local fire departments. Closures will be authorized by the project leader.

It is essential that employees be well informed about fire prevention and the objectives of the refuge's fire management program. Further, employees must be kept informed about changes in existing conditions throughout the fire season.

An active fire prevention program is, and will be, implemented in conjunction with other fire agencies to protect human life and property, and prevent damage to cultural resources or physical facilities. A program of internal and external education regarding potential fire danger will be implemented. Visitor contacts, bulletin board materials, handouts and interpretive programs may be utilized to increase visitor and neighbor awareness of preventing fires and other related fire hazards. "Smokey Bear" and other fire prevention and education materials may be obtained with the assistance of the zone and regional fire management offices

g. Public Education

The refuge, through the Cusano Environmental Education Center, has the opportunity to develop and present educational programs and exhibits educating the public on the value of fire as a natural process, and the need to prevent unwanted wildfires. Fire awareness education is important to increasing public understanding and support for fire management activities within the refuge system and other land management agencies. The refuge outreach staff should use the most appropriate and effective means to explain the overall program to include interpretive presentations addressing fire and its role in the environment, internal and external education regarding potential fire danger, bulletin board materials, and handouts

h. Community Grant Assistance

The local qualifying fire departments will be notified of any program opportunities, deadlines, and procedures.

i. Aviation

All aviation activities used at the refuge will conform to Service and Department aviation policies and the Interagency Helicopter Guidelines (IHOG). Due to the proximity of the Philadelphia International Airport and the city, all air operations must be coordinated with the Federal Aviation Administration (FAA) to avoid air traffic hazards and/or restrictions. All aviation activities will be pre-planned with a hazard/risk analysis to justify the need for the aviation resources and will be reviewed by both the regional safety officer and appropriate fire management personal prior to implementation. All aviation activities will require a pre-flight/ project safety briefing to identify any hazards or special procedures to the operation.

3. Initial Attack

All wildland fires will be suppressed with firefighter and public safety as the highest priority. Fires will be suppressed in a prompt, safe, aggressive, and cost-effective manner to produce smallest resource/acreage adverse impacts. Generally direct attack is the most cost-effective tactic, provided it can be done safely. Otherwise indirect tactics are necessary, as determined by the incident commander. In most cases, the local fire departments will be the primary initial attack responder to wildfires on refuge as covered under the cooperative agreements and delegation of authority (Appendix F).

a. Refuge Response

The refuge manager or designee will contact the local fire department with a request to commence initial attack action. The refuge manager will also inform the zone FMO. Qualified and available refuge staff should respond as well, performing such tasks as securing the fire origin, checking for visitors at risk, and implementing public closure at the scene. If the fire threatens to burn outside the refuge boundary, the manager will notify adjacent landowners.

b. Incident Commander

The refuge will use the Incident Command System (ICS) as a guide for suppression organization. When the responding fire department arrives, the senior officer of that department will serve as the incident commander responsible for the fire. The incident commander will brief the refuge manager on the location and status of the fire. The refuge manager will provide pertinent details on location and protection of special natural or cultural resources. The incident commander will do the following:

- Locate, size-up, and coordinate suppression actions, including briefing subordinates, directing their actions, and providing work tools.
- Provide public and firefighter safety.
- Considering current and predicted fire conditions assess need for additional suppression resources and estimate the final size of the fire. The potential for spread outside of the refuge should be predicted, as well as the total suppression force required to initiate effective containment action.
- Assess the need for law enforcement personnel for traffic control, investigations, evacuations, etc.
- Keep refuge manager informed.
- Provide information to the refuge manager so that a fire report can be prepared and provided to the zone FMO.
- Notify refuge manager when initial attack is not successful, so that planning for extended attack can begin and a Wildland Fire Situation Analysis can be developed for the next operational period.
- Other duties of the incident commander are described in the National Wildfire Coordinating Group Fireline Handbook.

c. Public Safety

Public safety will require coordination between all refuge staff and the incident commander. Notices should be posted to warn visitors, areas may be closed, and traffic control will be necessary if smoke crosses roads. Where wildland fires cross roads, burned areas adjacent to the road should be mopped up and dangerous snags felled. If needed, individuals not involved in suppression efforts may be evacuated.

4. Extended Attack

The incident commander will notify the refuge manager whenever it appears that a fire will exceed initial attack efforts, threaten Service/private lands, or when fire complexity will exceed the capabilities of command or operations. The refuge manager will be responsible for coordinating with the incident commander all extended attack actions including the following:

- Notifying the zone FMO.
- Completion and daily review of a wildland fire situation analysis (WFSA)(Zone FMO to be contacted for software and participation).
- Assignment or ordering of appropriate resources.
- Completion of delegation of authority.

5. Fire Investigation

After a wildland fire has been detected, refuge personnel should be wary of suspicious individuals or vehicles. Personnel should not disturb a fire location in the event an investigation is needed. Personnel from the responding fire department will attempt to locate and protect the probable point of fire origin and record pertinent information required to determine fire cause. They will be alert for possible evidence, protect the scene, and report findings to the incident commander. All suspicious fires will be promptly and efficiently investigated. Individuals should not question suspects or pursue the fire investigation unless they are currently law enforcement commission qualified.

Personnel from other agencies may investigate wildland fire arson or fire incidents involving structures. All fire investigations should follow guidelines in section 4.1-2 of the Services Fire Management Handbook. The Central Zone FMO should be contacted if needed.

6. Required Reporting

The refuge manager must report all wildland fires to the Central Zone FMO who will add the fire to the Fire Management Information System (FMIS). The incident commander will be responsible for documenting decisions and completing a fire report (e.g., ICS-214, Agency Wildland Fire Report). Fire reviews will be documented and filed with the final fire report. The Zone FMO will retain a copy and will be responsible for additional required reports such as an annual regional fire summary report and meeting national fire performance measures. This report will document fires by type, acres burned by fuel type, cost summary, personnel utilized, and fire effects (Appendix G).

B. Wildland Fire Use

As mentioned previously under section III.C, Wildland fire use is not considered a viable management option.

C. Prescribed Fire

As mentioned previously under section III.C, Prescribed fire is not considered a viable management option.

D. Nonfire Fuel Applications

Due to the proximity of the Philadelphia metropolitan area nonfire fuel treatments (mechanical and chemical) will be the main method to reduce fuel loads and maintain fire breaks, access, and improve the habitat by reducing the more flammable invasive and exotic vegetation. Fuels removal should be calculated in acres and reported to the Zone FMO for inclusion in the National Fire Plan Operating and Reporting System (NFPORS) as accomplished acres.

## E. Emergency Rehabilitation and Restoration

Post-fire repairs will fall into one of three categories: fire suppression activity damage, emergency stabilization, and rehabilitation (620 DM 3). Fire suppression activity damage is damage to resources, lands, and facilities resulting from wildland fire suppression actions, in contrast to damages resulting from the fire itself. Repair actions are planned and performed primarily by the suppression incident organization as soon as possible prior to demobilization. The incident management team, during transition back to the local unit, must document the fire suppression activity damage repair actions accomplished and those which are still needed. Fire suppression activity damage is paid by the same Wildland Fire Suppression Operations subactivity (9141) and project code as the fire suppression effort.

Emergency stabilization may be defined as planned actions to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to life or property resulting from the effects of a fire, or to repair/replace/construct physical improvements necessary to prevent degradation of land or resources. Emergency stabilization actions must be taken within one year following containment of a wildland fire. Stabilization actions must be documented in an approved plan which will describe in detail the actions proposed and costs, provision for monitoring of results, delineation of funding, and responsibilities for implementation. Funding is provided under the Wildland Fire Suppression Operations account, but using a different subactivity (9142, Emergency Stabilization) than suppression only. Funding up to $500,000 may be approved at the regional director level. Larger requests must be approved by the director. Examples of emergency stabilization actions that may be permitted include replacing or repairing minor facilities essential to public health and safety when no other options are available; placing structures to slow soil and water movement; stabilizing soils; increasing road drainage frequency and/or capacity to handle additional post-fire runoff; installing protective fences or barriers to protect treated or recovering areas; seeding to prevent establishment of invasive plants, and direct treatment of invasive plants; using integrated pest management techniques to minimize the establishment of nonnative species within the burned area; and monitoring of treatments and activities for up to 3 years.

Rehabilitation efforts are undertaken within three years of containment of a wildland fire to repair or improve fire-damaged lands unlikely to recover naturally to management approved conditions, or to repair or replace minor facilities damaged by the fire. These are long-term actions that have been already identified in approved land management plans. A rehabilitation plan will be written as a separate plan, independent of an emergency stabilization plan. Funding must be approved on a priority basis by the National Burned Area Emergency Rehab (BAER) Coordinators in consultation with the Office of Wildland Fire Coordination. Funds will fall under a burned area rehabilitation subactivity, not the Wildland Fire Operations account. Allowable actions may include chemical, manual, and mechanical removal of invasive species, and planting of native species to restore or establish a healthy, stable ecosystem; tree planting to reestablish burned habitat, reestablish native tree species lost in fire, and prevent establishment of invasive plants; and repair or replace fire damage to minor operating facilities such as campgrounds, interpretive signs and exhibits, and fences.

## V. Organization and Budget

A. Organization

The organizational structure for meeting fire program needs within this plan is based on a Service zone concept. The zone FMO, located at Wallkill River National Wildlife Refuge in New Jersey is the principal contact for technical support and assistance in fire management. In addition, there are other fire-funded positions in the zone that could assist in plan implementation.

1. Refuge Manager

The refuge manager is responsible for the full range of management duties within the refuge including fire management activities that implement an effective fire management program. Appropriate action will be taken by the refuge manager for fires on or adjacent to refuge lands. Related fire management activities include delegation of authority, designation of resource advisors on incidents, implementing extended initial attack organizations, developing cooperative agreements with local fire departments and State agencies, and authorizing the use of vehicles and heavy equipment within designated resource sensitive areas of the refuge.

2. Refuge Wildlife Biologist

The refuge wildlife biologist acts as resource advisor on initial and extended attack or project-size wildfires.

3. Regional Fire Management Branch Chief (RFMC)

Provides coordination, training, evaluation, and technical guidance, as requested, to the refuge staff, approves fire preparedness and fuels treatment budget requests. The RFMC will be informed of all wildfire suppression activity occurring on the refuge through the zone FMO.

4. Zone Fire Management Officer

The zone FMO, stationed at Wallkill River National Wildlife Refuge, advises the refuge manager or staff on matters relative to fire planning, fire preparedness, suppression, and prescribed burning. The zone FMO supplies technical assistance and experience relative to fire management activities and also advises the refuge manager on priorities, strategies, and tactics to reduce adverse fire impacts. The zone FMO coordinates fire training for refuge staff, enters fire reports into the computerized database, maintains staff qualifications through the IQCS system, and enters refuge base information and requests into the Fire Base/Fire Program Analysis (FPA) workload analysis and budgeting systems. The zone FMO makes recommendations to the RFMC on fire budget allocations to the refuge. The zone FMO may be called upon to gather additional resources necessary to implement this plan.

B. Budget

1. Refuge Fire Funding

No fire funds are specifically earmarked to conduct fire management activities at John Heinz NWR. However, funds can be requested to meet wildland urban interface/hazard fuel treatment, prevention, or minor equipment and personal protective equipment needs through the zone FMO on an annual basis. Other funds from regional fire program sources are available to cover training and associated travel and physical exams. In addition, costs of emergency suppression to local cooperators are reimbursable from the national fire management emergency operations funding. The surrounding Philadelphia Metro Fire Departments, through cooperative agreements, serve to meet suppression needs and suppression objectives of this plan.

2. Fire Program Analysis (FPA)

FPA is an interagency fire management workload analysis and budgeting system that will replace the existing FWS Firebase system beginning in fiscal year 2006. All Federal land ownerships within a given Fire Planning Unit (FPU) will be subject to a common optimization model that will determine optimum levels of resources by unit for a given funding level. Inputs to the system and running of the optimization model will take place during the remainder of fiscal year 2004 and 2005. John Heinz is part of the Pennsylvania FPU which includes all Service, National Park Service, and Forest Service land in PA. It is unknown at this time what effect, if any, FPA will have on allocation of fire resources to John Heinz NWR and other zone refuges.

## VI. Monitoring and Evaluation

The following fire research is needed at John Heinz NWR:

- Comprehensive inventory and assessment of the refuge's hazard fuels, and the identification and prioritization of hazard fuel units
- Assessment of hazard fuel management options and their effects upon refuge resource objectives
- Assessment of long and short-term fire effects in the habitats of the refuge with recommendations for treatment activities
- Assessment of treatment affects monitoring needs and preparation of monitoring plan

A. Monitoring and Research

The effects of fuel treatments upon the refuge's plant and animal population's needs to be better understood. Through applied research and careful application nonfire treatments, data collected can provide managers with a better understanding of the natural ecological effects, and the information needed to refine treatment types to meet resource objectives.

Monitoring will comply with accepted scientific methods. This data, along with information gathered through research studies, will be used to improve the effectiveness of the fire management program. Levels of data collection, from least expensive and intensive to the most elaborate, are as follows:

- Minimum levels (photo points)
- Intermediate (NPS Fire Effects Monitoring Handbook)
- Volume/weight removed measurements
- Maximum levels – integrate with other refuge monitoring programs to support adaptive management

B. Evaluation

1. After Action Review

Wildland fire responses with be evaluated by the incident commander and the refuge manger in the form of an After Action Review (AAR) as outlined in the Incident Response Pocket Guide.

2. Significant Wildland Fire Event Review

The regional fire management branch chief, refuge manager, incident commander, and zone FMO will conduct formal fire reviews in the event of the following, as outlined in the FWS FMHB 3.6:

- Significant injury/accident
- Significant property or resource damage
- Significant safety concerns

3. National Wildland Fire Performance Measures

The refuge manager and zone FMO will conduct a yearly review of the overall fire management program. The review will cover project funding and expenditures, nonfire treatment accomplishments, and program review. This information will be complied for inclusion in the yearly Regional Fire Management Government Performance Results Act (GPRA) goals.

# Definitions

**Agency Administrator**. The appropriate level manager having organizational responsibility for management of an administrative unit. May include Director, State Director, District Manager or Field Manager (BLM); Director, Regional Director, Complex Manager or Project Leader (FWS); Director, Regional Director, Park Superintendent, or Unit Manager (NPS), or Director, Office of Trust Responsibility, Area Director, or Superintendent (BIA).

**Appropriate Management Action**. Specific actions taken to implement a management strategy.

**Appropriate Management Response**. Specific actions taken in response to a wildland fire to implement protection and fire use objectives.

**Appropriate Management Strategy**. A plan or direction selected by an agency administrator which guide wildland fire management actions intended to meet protection and fire use objectives.

**Appropriate Suppression**. Selecting and implementing a prudent suppression option to avoid unacceptable impacts and provide for cost-effective action.

**Bureau**. Bureaus, offices, or services of the Department.

**Burning Index (BI).** A number combining the spread and energy release component related to the contribution of fire behavior to the effort of containing a fire.

Class of Fire (as to size of wildland fires):
Class A - ¼ acre or less.
Class B - more than ¼ but less than 10 acres.
Class C - 10 acres to 100 acres.
Class D - 100 to 300 acres.
Class E - 300 to 1,000 acres.
Class F - 1,000 to 5,000 acres.
Class G - 5,000 acres or more.

**Emergency Fire Rehabilitation/Burned Area Emergency Rehabilitation (EFR/BAER).** Emergency actions taken during or after wildland fire to stabilize and prevent unacceptable resource degradation or to minimize threats to life or property resulting from the fire. The scope of EFR/BAER projects are unplanned and unpredictable requiring funding on short notice.

**Energy Release Component (ERC)**. A number related to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. It is generated by the National Fire Danger Rating System, a computer model of fire weather and its effect on fuels. The ERC incorporates thousand hour dead fuel moistures and live fuel moistures; day to day variations are caused by changes in the moisture content of the various fuel classes. The ERC is derived from predictions of (1) the rate of heat release per unit area during flaming combustion and (2) the duration of flaming.

**Extended attack**. A fire on which initial attack forces are reinforced by additional forces.

**Fire Suppression Activity Damage**. The damage to lands, resources and facilities directly attributable to the fire suppression effort or activities, including: dozer lines, camps and staging areas, facilities (fences, buildings, bridges, etc.), handlines, and roads.

**Fire effects**. Any consequences to the vegetation or the environment resulting from fire, whether neutral, detrimental, or beneficial.

**Fire intensity**. The amount of heat produced by a fire. Usually compared by reference to the length of the flames.

**Fire management**. All activities related to the prudent management of people and equipment to prevent or suppress wildland fire and to use fire under prescribed conditions to achieve land and resource management objectives.

**Fire Management Plan**. A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational procedures such as preparedness plans, preplanned dispatch plans, prescribed fire plans and prevention plans.

**Fire prescription**. A written direction for the use of fire to treat a specific piece of land, including limits and conditions of temperature, humidity, wind direction and speed, fuel moisture, soil moisture, etc., under which a fire will be allowed to burn, generally expressed as acceptable range of the various fire-related indices, and the limit of the area to be burned.

**Fuels**. Materials that are burned in a fire; primarily grass, surface litter, duff, logs, stumps, brush, foliage, and live trees.

**Fuel loadings**. Amount of burnable fuel on a site, usually given as tons/acre.
Hazard fuels. Those vegetative fuels which, when ignited, threaten public safety, structures and facilities, cultural resources, natural resources, natural processes, or to permit the spread of wildland fires across administrative boundaries except as authorized by agreement.

**Initial Attack**. An aggressive suppression action consistent with firefighter and public safety and values to be protected.

**Keetch - Byram Drought Index (KBDI).** An indicator of drought on the availability of fuel to burn in the heavier fuels and litter and duff layers.

**Maintenance burn**. A fire set by agency personnel to remove debris; i.e., leaves from drainage ditches or cuttings from tree pruning. Such a fire does not have a resource management objective.

**Natural fire**. A fire of natural origin, caused by lightning or volcanic activity.

**NFDRS Fuel Model**. One of 20 mathematical models used by the National Fire Danger Rating System to predict fire danger. The models were developed by the U.S. Forest Service and are general in nature rather than site specific.

**NFFL Fuel Model**. One of 13 mathematical models used to predict fire behavior within the conditions of their validity. The models were developed by U.S. Forest Service personnel at the Northern Forest Fire Laboratory, Missoula, Montana.

**Prescription**. Measurable criteria which guide selection of appropriate management response and actions. Prescription criteria may include safety, public health, environmental, geographic, administrative, social, or legal considerations.

**Prescribed Fire**. A fire ignited by agency personnel in accord with an approved plan and under prescribed conditions, designed to achieve measurable resource management objectives. Such a fire is designed to produce the intensities and rates of spread needed to achieve one or more planned benefits to natural resources as defined in objectives. Its purpose is to employ fire scientifically to realize maximize net benefits at minimum impact and acceptable cost. A written, approved prescribed fire plan must exist and NEPA requirements must be met prior to ignition. NEPA requirements can be met at the land use or fire management planning level.

**Preparedness**. Actions taken seasonally in preparation to suppress wildland fires, consisting of hiring and training personnel, making ready vehicles, equipment, and facilities, acquiring supplies, and updating agreements and contracts.

**Prevention.** Activities directed at reducing the number or the intensity of fires that occur, primarily by reducing the risk of human-caused fires.

**Rehabilitation.** (1) Actions to limit the adverse effects of suppression on soils, watershed, or other values, or (2) actions to mitigate adverse effects of a wildland fire on the vegetation-soil complex, watershed, and other damages.

**Spread Component (SC).** A rating of the forward rate of spread of a head fire

**Suppression**. A management action intended to protect identified values from a fire, extinguish a fire, or alter a fire's direction of spread.

**Unplanned ignition**. A natural fire that is permitted to burn under specific conditions, in certain locations, to achieve defined resource objectives.

**Wildfire**. An unwanted wildland fire.
**Wildland Fire**. Any non-structure fire, other than prescribed fire, that occurs in the wildland.

**Wildland Fire Situation Analysis (WFSA).** A decisionmaking process that evaluates alternative management strategies against selected safety, environmental, social, economical, political, and resource management objectives as selection criteria.

**Wildland/urban interface fire**. A wildland fire that threatens or involves structures.

## LITERATURE CITED

Anderson, H.E. 1982. Aids to Determining Fuel Models For Estimating Fire Behavior. USDA Forest Service. 22p. Ogden, Utah

Department of the Interior. 1998. Department of Interior Manual, Part 620, Wildland Fire Management. *http://elips.doi.gov/elips/release/3203.htm*; access January 2012.

Environmental Protection Agency web page: *http://www.epa.gov.*

FIREMONv1.1, 10/30/2003. Fire Regime and Condition Class Field Procedures-Standard & Scorecard Methods.

Incident Operations Standards Working Team. 2004. National Wildfire Coordinating Group Fireline Handbook – Handbook 3. Washington, DC. *http://www.nwcg.gov/pms/pubs/410-1/410-1.pdf*; accessed January 2012.

Interagency Agreement between the Bureau of Land Management, Bureau of Indian Affairs, National Park Service, US Fish and Wildlife Service of the United States Department of the Interior and the Forest Service of the United States Department of Agriculture (1996).

Interagency Incident Business Management Handbook.

National Fire Weather Page: *http://www.srh.noaa.gov/ridge2/fire/*; accessed January 2012.

National Weather Service, Mount Holly, NJ Forecast Office web page: *http://www.erh.noaa.gov/er/phi/;* accessed January 2012.

National Wildfire Coordinating Group, Wildland and Prescribed Fire Qualification System Guide, PMS 310-1, January 2000.

New Jersey Forest Fire Service. 1997. Protecting New Jersey's Forests From Wildfire. NJ Department of Environmental Protection, Division of Parks and Forestry, Forest Fire Service. 20p. Trenton, New Jersey.

Pyne, Stephen, 1982. Fire in America: A Cultural History of Wildland and Rural Fire. University of Washington Press. 654 pp.

Rothermel, R. 1983. General Technical Report INT 143 - How to Predict the Spread and Intensity of Forest and Range Fires. USDA Forest Service. Intermountain Forest and Range Experiment Station. Ogden, Utah.

U.S. Fish and Wildlife Service, 1994. Air Quality Management Plan. Air Quality Branch – Division of Refuges. 14p. Denver, Colorado.

U.S. Fish and Wildlife Service. 2012. Fire Management Handbook. National Interagency Fire Center. Boise, ID. *http://www.fws.gov/fire/handbook/index.shtml*; accessed January 2012.

Western Governor's Association. 2001. A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment, 10-Year Comprehensive Strategy. *http://www.fire-ecology.org/policy/west_gov_assoc_strategy.pdf*; accessed January 2012.

## CONSULTATION AND COORDINATION

All fire management program activities will be implemented in cooperation and coordination with Federal, State, county, and local agencies. The following individuals were contacted and contributed during the development of this plan:

Allan Carter, RFMC – Region 5, U.S. Fish and Wildlife Service
Michael Durfee, Region 5 Central Zone FMO, Wallkill River National Wildlife Refuge
Kate McManus, Refuge Manager, John Heinz National Wildlife Refuge at Tinicum
Gary Stolz, Deputy Refuge Manger, John Heinz National Wildlife Refuge at Tinicum
Brendalee Phillips, Wildlife Biologist, John Heinz National Wildlife Refuge at Tinicum
Laura Mitchell, Regional Fire Ecologist, Region 5, U.S. Fish and Wildlife Service

# Figures



# Appendices

**APPENDIX A: Section 7 Consultation**

**INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM**

Originating Person and Station Name: Brendalee Phillips, John Heinz National Wildlife Refuge at Tinicum, Philadelphia, PA.

Telephone Number: (215) 365-3118 Facsimile Numbers: (215) 365-2846

Date: December 12, 2005

Project Title: Fire Management Plan

I. Service Program: Fire Management at John Heinz National Wildlife Refuge at Tinicum

II. Geographic Area Including Name of County/City and State and Specific Project Location: John Heinz National Wildlife Refuge at Tinicum lies within both Delaware County and Philadelphia County, Pennsylvania at 8601 Lindbergh Blvd. (N 39°53'31", W 75°15'31').

See attached maps.

III. Proposed Activity:

The Fire Management Plan (FMP) for John Heinz National Wildlife Refuge (NWR) at Tinicum describes how the refuge will respond to a wildland fire on the property. No prescribed fire burning is proposed. All wildfires on the refuge will be suppressed. Currently no employees of the refuge are qualified to suppress wildland fire, so all suppression efforts will be done by outside responders such as the local departments. A dispatch plan in the FMP outlines steps the refuge will take to respond to a fire, which include notifying the local fire department, refuge staff, adjacent landowners, the zone fire management officer, and the appropriate agency responsible for road conditions if smoke obscures highways.

Firefighter and public safety will be the first priority of fire suppression efforts. Values at risk will be the next priority, and they will be protected to the maximum extent possible without compromising firefighter and public safety. Significant values at risk are the Cusano Environmental Education Center and adjacent private properties. These properties include an industrial complex (oil tank farm), several light industrial facilities, multiple single and multi family houses, and the Philadelphia Fire Academy. Other areas or values that would be at risk include Interstate 95 and the Philadelphia Airport, refuge structures and improvements, and wildlife habitat. The use of heavy equipment such as crawlers, tractors, bulldozers, or graders requires approval of the refuge manager. Such equipment will not be used within the refuge boundaries to suppress fire unless their use is necessary to prevent a fire from destroying privately-owned and/or government buildings. If new natural or cultural resources of concern are discovered during fire suppression activities, the refuge manager will ensure their protection from damage related to fire activities to the extent appropriate and possible.

IV. Pertinent Species and Habitat Within Action Area

A. Action area: The action area includes the entire refuge (993 acres).

B. List of listed species/critical habitat, proposed species/critical habitat, and candidate species known to occur or potentially occurring within the action area. Include species/habitat occurrence on a map (preferably a U.S.G.S. quad.), when known, such that their relationship to the project location can be determined.

Bald eagles are regularly seen feeding in refuge impoundment and marsh year-round.

V. Determination of Effects

A. Explanation of the adverse and beneficial effects of the action on species and/or critical habitat listed above.

The FMP is not expected to have adverse or beneficial effects on bald eagles which do not nest on the refuge. Most fire management activities on the refuge, including small scale mowing and hand application of herbicide are not anticipated to affect bald eagles feeding in refuge waters. Aerial spraying of refuge marshes with herbicide may occur once a year and it is anticipated that large parts of the refuge will remained undisturbed and available for feeding bald eagles. Wildland fire and suppression on the refuge would constitute an emergency and therefore trigger emergency consultation procedures if they affected listed species.

B. Explanation of actions to be implemented to reduce adverse effects:

As stated above, wildland fire suppression on the refuge would occur under emergency circumstances. The FMP includes measures that could protect listed species if they were in the area. However, because the first priority of the plan is firefighter and public safety, these measures may not be taken if firefighter or public safety is at risk. As stated in the plan, adverse effects to natural resources will be minimized to the extent that firefighter and public safety is ensured.

VI. Effect Determination and ES Response Requested

A. Listed species/designated critical habitat:

| Field Station Determination | Species Name(s) | Ecological Services Response Requested (check one) |
|---|---|---|
| No effect | Bald eagle | ____X___None Needed |
| Is not likely to adversely affect | | _____Concurrence |
| Is likely to adversely affect | | _____Formal Consultation |

| Field Station Determination | Critical Habitat For NONE | Ecological Services Response Requested (check one) |
|---|---|---|
| No effect | | _____None Needed |
| Is not likely to destroy or adversely modify | | _____Concurrence |
| Is likely to destroy or adversely modify | | _____Formal Consultation |

B. Proposed species/proposed critical habitat/candidate species:

| Field Station Determination | NONE | Ecological Services Response Requested (check one) |
|---|---|---|
| No effect | | _____None Needed |
| Is not likely to adversely affect | | _____Concurrence |
| Is likely to jeopardize | | _____Conference |

| Field Station Determination | Critical Habitat For NONE | Ecological Services Response Requested (initial/check one) |
|---|---|---|
| No effect | | _____None Needed |
| Is not likely to adversely affect | | _____Concurrence |
| Is likely to destroy or adversely modify | | _____Conference |

VII. Reviewing Ecological Services Field Office Evaluation

A. Concurrence_____ Nonconcurrence_____

B. Formal consultation required_____

C. Conference required_____

D. Informal conference required_____

E. Remarks:

_____ _____

Supervisor, ES Field Office Date

**APPENDIX B: Cooperative Agreements**

# See Following Documentation Pages

## APPENDIX C: Fire and fuel treatment occurrence at John Heinz NWR

| YEAR | WF | ACRES | RX | ACRES | WUI* | ACRES (m,c,f) |
|---|---|---|---|---|---|---|
| 1983 | | 11 | | | | |
| 1985 | 3 | 3.6 | | | | |
| 1986 | 5 | 0.9 | | | | |
| 1987 | 5 | 3.7 | | | | |
| 1988 | 1 | 17.2 | | | | |
| 1989 | 2 | 7.3 | | | | |
| 1992 | 1 | 1 | | | | |
| 1996 | 1 | 0.1 | | | | |
| 1999 | 1 | 10 | | | | |
| 2001 | 2 | 0.3 | | | | |

* Wildland Urban Interface Treatment Types (WUI) Codes - (m) - mechanical (c) - chemical (f) – fire

# APPENDIX D: Behave Runs

| Direct Inputs | |
|---|---|
| Dominant fuel model | 3 |
| Percent cover | 100 |
| Other fuel model | 3 |
| 1-h fuel moisture (%) | 6 |
| 10-h fuel moisture (%) | 9 |
| 100-h fuel moisture (%) | 15 |
| Herbaceous fuel moisture (%) | |
| Woody fuel moisture (%) | |
| Mid flame wind speed (mph) | 6 |
| Cardinal wind direction (°) | NW |
| Terrain slope (%) | 0 |
| Aspect of slope (°) | SE |
| Calc maximum spread rate | Yes |
| Directions are relative to the | |
| Dir.for spread calculation (°) | |

| Direct Outputs | |
|---|---|
| Rate of spread (ch/hr) | 148.4 |
| Heat per unit area (Btu/ft²) | 742 |
| Fireline intensity (Btu/ft/s) | 2,019 |
| Flame length (feet) | 14.9 |
| Reaction intensity (Btu/ft²/m) | 2,900 |
| Effective windspeed (mph) | 6 |
| Direction of maximum spread (°) | 135 |

| Direct Inputs | |
|---|---|
| Dominant fuel model | 1 |
| Percent cover | 100 |
| Other fuel model | 3 |
| 1-h fuel moisture (%) | 6 |
| 10-h fuel moisture (%) | 9 |
| 100-h fuel moisture (%) | 15 |
| Herbaceous fuel moisture (%) | |
| Woody fuel moisture (%) | |
| Mid flame wind speed (mph) | 6 |
| Cardinal wind direction (°) | NW |
| Terrain slope (%) | 0 |
| Aspect of slope (°) | SE |
| Calc maximum spread rate | Yes |
| Directions are relative to the | |
| Dir.for spread calculation (°) | |

| Direct Outputs | |
|---|---|
| Rate of spread (ch/hr) | 135 |
| Heat per unit area (Btu/ft²) | 91 |
| Fireline intensity (Btu/ft/s) | 224 |
| Flame length (feet) | 5.4 |
| Reaction intensity (Btu/ft²/m) | 826 |
| Effective windspeed (mph) | 6 |
| Direction of maximum spread (°) | 135 |

| Direct Inputs | |
|---|---|
| Dominant fuel model | 9 |
| Percent cover | 100 |
| Other fuel model | 3 |
| 1-h fuel moisture (%) | 6 |
| 10-h fuel moisture (%) | 9 |
| 100-h fuel moisture (%) | 15 |
| Herbaceous fuel moisture (%) | |
| Woody fuel moisture (%) | |
| Mid flame wind speed (mph) | 6 |
| Cardinal wind direction (°) | NW |
| Terrain slope (%) | 0 |
| Aspect of slope (°) | SE |
| Calc maximum spread rate | Yes |
| Directions are relative to the | |
| Dir.for spread calculation (°) | |

| Direct Outputs | |
|---|---|
| Rate of spread (ch/hr) | 11.7 |
| Heat per unit area (Btu/ft²) | 370 |
| Fireline intensity (Btu/ft/s) | 79 |
| Flame length (feet) | 3.4 |
| Reaction intensity (Btu/ft²/m) | 2,391 |
| Effective windspeed (mph) | 6 |
| Direction of maximum spread (°) | 135 |

## APPENDIX E: Step-up Plan

Daily fire danger indices will be compiled and averaged using the NFDRS stations located at Forsythe NWR in New Jersey and Prime Hook NWR in Delaware, then compared to the indices used by the NJ State Forest Fire Service.

Fuel Model R - May 15 to October 15

| Adjective Class | KDBI | Burning Index |
|---|---|---|
| Low | less than 140 | 0 to 10 |
| Moderate | 141 to 260 | 11 to 15 |
| High | 261 to 380 | 16 to 20 |
| Very High | 381 to 500 | 21 to 25 |
| Extreme | over 500 | over 25 |

Fuel Model E - October 15 to May 15

| Adjective Class | KDBI | Burning Index |
|---|---|---|
| Low | less than 140 | 0 to 30 |
| Moderate | 141 to 260 | 31 to 38 |
| High | 261 to 380 | 39 to 47 |
| Very High | 381 to 500 | 48 to 53 |
| Extreme | over 500 | over 54 |

| PREPAREDNESS ACTIONS | STAFFING LEVELS | | |
|---|---|---|---|
| | Low and Medium | High | Very High and Extreme |
| REFUGE STAFF/COLLATERAL FIREFIGHTERS | | | |
| Carry PPE with them while on duty (Including Nomex and boots) | | X | X |
| May be assigned to an engine at a station or patrol | | | X |
| Work weeks and/or tours of duty may be extended | | | X |
| FIRE EQUIPMENT | | | |
| Engines in ready status (15 min or less) | 0 | 1 | 1 |
| FIRE PREVENTION ACTIVITIES | | | |
| Post fire danger signs at high public use areas | | | X |
| Restrict vehicles to paved/gravel parking areas, remain within boats and close select trails and public use areas | | | X |
| MISCELLANEOUS EMERGENCY PRESUPPRESSION ACTIONS | | | |
| Notify Zone FMO and open emergency preparedness account | | | X |
| Preposition FWS and interagency resources as needed | | | X |

## APPENDIX F: Delegation of Authority

***Name of Incident Commander*** is assigned as Incident Commander of the ***Name of Incident***, ***Name of Refuge or Unit*** for the US Fish and Wildlife, effective ***Time and Date.***

The Incident Commander has full authority and responsibility for managing the fire suppression activities within the framework of the law and Fish and Wildlife Service policy and direction as provided by this office. The Resource Advisor will provide habitat Management Plans and other appropriate documents.

***Names of Resources Advisors and contact Information*** are assigned as Resource Advisors. They or the Refuge Manager will be consulted in situations where natural resource decisions or tradeoffs are involved unless life safety issues require immediate attention and those actions will be documented.

Specific direction and fire suppression priorities for the ***Name of Incident*** are as follows, and are in priority order:

1. Provide for firefighter and public safety.

2. Use of minimal impact techniques should be employed to reduce habitat damage. Use natural barriers and roads if possible for burnout operations.

3. Use of dozers or tractors requires approval of the Refuge Manager of their designate (resource advisors) prior to implementation.

**Turn Back Standards**

1. All ***Name of Incident*** contracts, agreements, bills, medical problems, equipment repairs, and fire cache re-supply shall be closed out prior to team being released.

2. Road or levee damage during suppression efforts will be repaired prior to the teams departure.

3.Fire perimeter mopped-up ***Specify*** and all lines checked for heat and integrity.

4. Rehabilitation Plan will be completed in Coordination with the Refuge Biologists and Resource Advisors.

5. Fire perimeter mapped by GPS and loaded into the Refuges GIS Database.

6. Tort claims reviewed by Refuge Manager or their designee.

The Deputy Refuge Manager, Fire Program Manager, or their designate will represent the Refuge Manager on any occasion where Refuge Manager is not immediately available.

Refuge Manager, _____

***Name of Refuge or Unit***, _____

***Date and Time***_____

# APPENDIX G: FMIS WILDLAND FIRE REPORT

**GENERAL TAB**

(1) Fire Type:
(2) Org. Code:
(3) Fire Name:
(4) Discovery Date:
(5) County: Code:
(6) Cong. District:
(7) Fire Subtype:
(8) Measurement Method:
(9) Ignition Owner:
(10) Ignition State:
(11) Ignition Cause:
(12) WFSA? Yes or No
(13) If WFSA = yes, Date:

(14) Burn State:
Burn State:
(15) Burn Owner:
Burn Owner:
(16) Burn Acres:
Burn Acres:

(17) Management Level:

| (18) **Resource Type** | (19) **Quantity** | **Resource Type** | **Quantity** |
|---|---|---|---|

**Values at Risk**

| (20) **Type** | (21) **Subtype** |
|---|---|

(22) Discovery Date: (23) Time: (24) Initial Attack Date: (25) Time:
(26) Control Date: (27) Time: (28) Out Date: (29) Time:

**LOCATION TAB**

(30) Latitude: (31) Longitude:
(32) Aspect: (33) Lay of Land: (34) Slope:
(35) Position of Slope: (36) Elevation:
(37) Special Area Type:

**EMISSIONS TAB**

(38) Fire Danger Index: (39) Value:

**FINAL TAB**

(40) Person Completing Form: (41) Title: _____ (42) Date:
(43) I.C.:
(44) Narrative:

## APPENDIX H - DISPATCH PLAN – JOHN HEINZ NWR AT TINICUM

**1. When a report of smoke or fire is received the following information should be recorded:**

Location of smoke or fire: _____

Location of person reporting: _____

Name of person reporting fire: _____

Telephone number of person reporting fire: _____

Size of fire: _____

Are any persons or structures in immediate danger from fire?: No Yes- How many? ___

Character of fire (running, creeping, direction, etc.): _____

Type of fuel/ vegetation: _____

Color of smoke: _____

Anyone fighting fire?: _____

Did they see anyone in vicinity or vehicles leaving area?: _____

Time since caller first noticed fire to time call placed: _____

**2. Notify personnel in the following order**:

1. Fire Department-911
2. Refuge Manager: Gary Stolz — Wk: (215) 365-3118, Cell: (610) 804-3552

If not reached, notify (all Wk #'s same as Manager)

| | |
|---|---|
| Deputy Refuge Manager: Larry Woodward | Cell: (610) 842-3673 |
| Facility Manger: Mike McMenamin | Cell: (484) 571-6962 |
| Refuge Biologist: Brendalee Phillips | Cell: (610) 842-4363 |

*Have the following respond to the fire:*
*Resource Advisor= Highest grade staff member on Duty from the Refuge*
*Incident Commander= Person determined by Refuge Manager when contacted as above.*

## APPENDIX I – John Heinz NWR at Tinicum Communications List (Last Updated October 13, 2010)

| Title | Last Name | First Name | Address | Work Number | Cell Number |
|---|---|---|---|---|---|
| Refuge Manager | Stolz | Gary | 8601 Lindbergh Blvd. Philadelphia, PA 19153 | 215-365-3118 | 610- 804-3552 |
| Deputy Manager | Woodward | Larry | | | 610-842-3673 |
| Facility Manager | McMenamin | Mike | | | 484- 571-6962 |
| Refuge Biologist | Phillips | Brendalee | | | 610-842-4363 |
| Refuge Officer (LE) | Pinsonneault | Derick | | | 484-571-7110 |
| Title | Last Name | First Name | Address | Work Number | Cell Number |
| Folcroft Co. No. 1 Chief | Weber | Tom Sr. | 1647 Delmar Dr. Folcroft, PA 19032 | 610-461-2256 | Folcroft Co. No. 1 Chief |
| Norwood Co. No. 1 Chief | Davis | Joe | 26 W. Winona Norword, PA 19074 | 610-461-1111 | Norwood Co. No. 1 Chief |
| Norwood Co. No. 1 Deputy Chief | Bradley | Jim Sr. | | | Norwood Co. No. 1 Deputy Chief |
| Norwood Co. No. 1 Deputy Chief | Givens | Chris | | | Norwood Co. No. 1 Deputy Chief |
| Philadelphia Commissioner | Ayers | Lloyd | 240 Spring Garden St., Philadelphia, PA 19123 | 215-686-1300 | Philadelphia Commissioner |
| Prospect Park Chief | Signora | Michael | 1001 Lincoln Ave. Prospect Park, PA 19076 | 610-522-1830 | Prospect Park Chief |
| Tinicum Township Fire Company - Chief | Lee | Walter | 99 Wanamaker Ave. Essington, PA 19029 | 610-521-3944 | 610-637-6669 |