Draft

ENVIRONMENTAL ASSESSMENT

OF THE

FIRE MANAGEMENT PLAN

FOR

OHIO RIVER ISLANDS NATIONAL WILDLIFE REFUGE

OHIO, PENNSYLVANIA, WEST VIRGINIA, KENTUCKY

MARCH 2008

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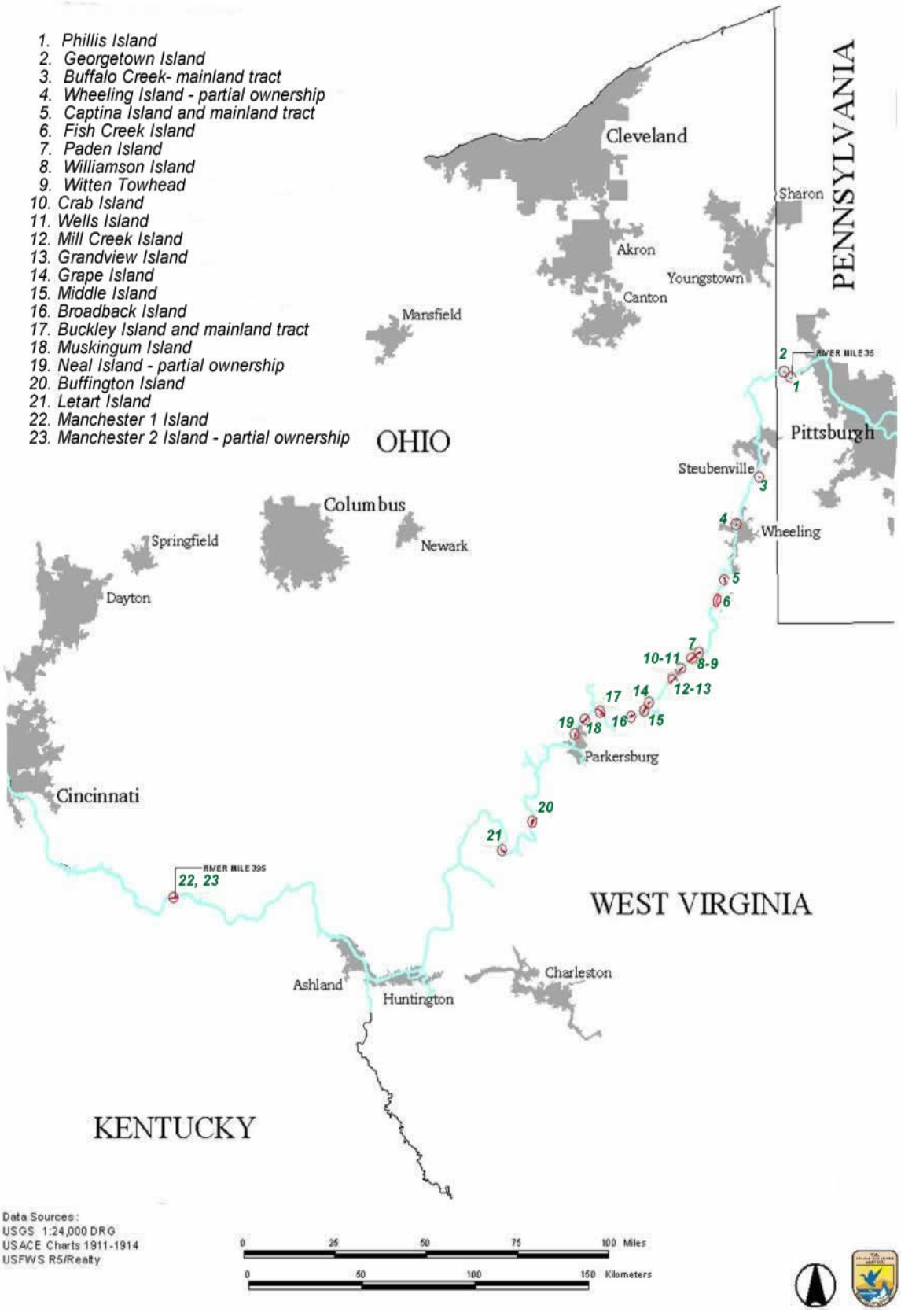
Figure 1. Map of Ohio River Islands National Wildlife Refuge.



Summary

US Fish and Wildlife (FWS) policy requires that any refuge containing combustible vegetation must prepare a Fire Management Plan (FMP). These plans are to be renewed every five years or when significant changes in management goals or strategy take place.

At the onset of planning for the revised FMP, Refuge management expressed a desire to examine the use of prescribed fire in management strategies for the refuge. This change in strategy requires an assessment of environmental effects. This document provides the analysis for the new management strategy.

Four alternatives were considered:

Alternative A is the No Action Alternative. This means that policy would remain unchanged. Full and aggressive suppression of fires would take place and no prescribed fire would be undertaken.

Alternative B is the FWS Preferred Alternative. This alternative would permit the introduction of prescribed fire into the group of alternatives used for vegetation enhancement and control. This effort would be in concert with other treatment options such as mechanical and hand treatment. Fire suppression strategy would be modified to the extent that appropriate management response (AMR) would be employed analyzing tactics and employing the most cost effective and resource responsible methods.

Alternative C is utilizing Wildland Fire Use. In this alternative wildland fires would be permitted to burn under specific conditions for resource enhancement. This alternative was discarded as impractical.

Alternative D is No Management. This alternative would abandon management of the refuge and allow fire to follow a totally natural course. This alternative was discarded as impractical.

This environmental assessment (EA) analyzes the impact of the fire program on vegetation, non native invasive species, wildlife, threatened, endangered and sensitive species, soils, water resources, air quality, and public health and safety. Methods to mitigate impacts to refuge resources were considered and listed. Cumulative effects were considered and described. Based on the analysis, there are no direct, indirect or cumulative major effects to resources resulting from the preferred alternative.

Public Comment

Public comments will be received for a period of 30 days. Comments can be sent to the address below. Please note that all comments received will be available to the public unless you state a desire to remain anonymous. This must be done prominently at the beginning of your request. All comments from businesses, organizations and persons identifying themselves as representatives of the same will be available for public inspection.

Refuge Manager
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1.0 INTRODUCTION

The US Department of the Interior Policy (620 DM 1.4) states "…every area with burnable vegetation must have an approved Fire Management Plan (FMP)." The Ohio River Islands NWR Fire Management Plan has been developed in response to that policy statement.

1.1 Purpose and Need for an Environmental Assessment

As defined by the Council of Environmental Quality (CEQ) in 40 CFR 1508.9, an Environmental Assessment is *"the public document in which environmental and other pertinent information on a proposed action are presented, providing a basis for a determination whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI)."*

The creation of the Ohio River Islands National Wildlife Refuge (ORINWR) Fire Management Plan (FMP) contains a change in planning that includes the introduction of prescribed fire into portions of the ORINWR to aid in the management of agency lands. It also includes the implementation of the concept of Appropriate Management Response (AMR).

The Comprehensive Conservation Plan (CCP) for the ORINWR was written and approved in 2001. It contains the required elements of an Environmental Assessment, including a Record of Decision and Finding of No Significant Impact. No mention of fire management, fire suppression or fuels treatment was made in that document. Since that writing, conditions, emphasis and policy regarding fire management have changed.

The 2001 Federal Fire Management Policy update addresses 17 wildland and prescribed fire related directives. The key items to this update of a 1995 policy effort were:

- Safety. Safety of both the public and firefighters is the first priority in any fire management decision. All FMP's must reflect this commitment.
- Fire Management and Ecosystem Sustainability. A full range of fire management activities are to be used to help achieve ecosystem sustainability.
- Use of Wildland Fire. Wildland fire will be used to protect, maintain, and enhance resources…

The goals and objectives identified by the ORINWR staff in the Interdisciplinary Team Meeting for this EA are as follows:

1) Develop a systematic approach to wildfire response mandating firefighter and public safety as the first priority.
2) Develop a plan for integration of prescribed fire into a program of treatments including mechanical use and hand treatments among others, for Refuge properties that meet the goals of enhanced fire protection, invasive plant management and eradications, and desirable species reestablishment.
3) Develop a Refuge fire education plan that can be implemented in conjunction with other educational events conducted on site.

1.2 Location and Description

The Ohio River Islands National Wildlife Refuge lies within the States of Pennsylvania, West Virginia, Ohio, and Kentucky. The Refuge consists of a string of twenty two islands in the Ohio River channel along with three adjacent mainland properties. The geographic area encompassed by the ORINWR is Ohio River Mile 0 near Pittsburgh, Pennsylvania to River Mile 437 at Meldahl Dam in Kentucky.

The islands comprise a total of 1,643 acres of dry land. The adjacent underwater ownership is of equal importance containing an additional 1,734 acres of land which lies below the current average water level of the river. This underwater segment of the refuge is land that existed above water prior to the construction of dams for navigation. Litigation conducted prior to the transfer of these lands to the Fish and Wildlife Service established the ownership of these below water lands. The ownership of this land by FWS is an integral feature of the Refuge as the land below the water contains habitat for 38 species of freshwater mussels. Two of these species are listed as endangered by FWS.

The islands are classic examples of bottomland hardwood forests. These stands of trees represent the natural climax community and serve as habitat for a variety of fauna. Resident or migratory birds, mammals, reptiles, and fish occupy various sites and niches.

1.3 Relationship to Other Plans

In discussion with Refuge staff during the interdisciplinary team review portion of this effort, a desire was expressed to determine if prescribed fire could aid in controlling invasive species and enhancing native vegetation. Literature search of on-site species and their response to fire was conducted with indications that the process was practical and could prove beneficial in refuge management.

These two items, discussion of AMR and introduction of prescribed fire changed the premise of the planning done in the CCP sufficient to require this EA. The FMP and its associated EA are step-down plans from the Comprehensive Conservation Plan completed in 2001.

1.4 Laws, Policies, and Authorities

The laws and policies stated below describe the framework under which the Refuge is operated. It further outlines the laws regulating important environmental elements that must be considered when making a decision of this type.

The Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j). This act outlines the refuge's primary purpose "*…for the development, management, advancement, conservation, and protection of fish and wildlife resources…" "… for the benefit of the United States Fish and Wildlife Services, in performing its activities and services."*

National Wildlife Refuge System Administration Act of 1996 amended by the National Wildlife Refuge 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 insure that biological integrity and environmental health of the system are maintained and that growth of the system supports the mission.

National Environmental Policy Act of 1969 (Public Law 91-190). This public law requires the assessment of federal actions and their impact on a broad range of environmental attributes. Preparation of this EA is a contribution to that effort.

Land and Water Conservation Fund Act of 1948. This act provides funding from sale of surplus federal land for the acquisition of lands such as this refuge.

Endangered Species Act of 1973 (16 U.S.C. 1531-1544). This act provides for the conservation of species of fish, wildlife, and plants, deemed to be threatened or endangered as well as the habitats they reside in.

Emergency Wetlands Resources Act of 1986. This act authorized the purchase of wetlands using Land and Water Conservation Fund monies, which had previously been prohibited.

The Federal Noxious Weed Act. (Public Law 93-629) 1974. This law provides a framework for the control of noxious weeds.

Executive Order 11988 and 11990 Floodplain Management 1977. These orders direct the protection of floodplains from adverse federal actions and require avoidance of floodplain development.

Executive Order 13122 Invasive Species 1999. This order mandates preventing the introduction of invasive species and treating infestations when found on federal land.

National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee). This act provides guidelines for administration and management of all areas of the system and describes measures for protecting endangered species.

Archeological Resources Protection Act (16 U.S.C. 470aa-470ll) 1979. This act establishes federal control of archeological resources on federal land.

National Historic Preservation Act of 1966 (16 U.S.C. 470-470b). This act provides for the designation and protection of historic structures. The act requires federal agencies to consider the impact of activities on designated or potential historic structures.

Executive Order 12996 Management and Public Use of the National Wildlife Refuge System 1969. This Order defines the conservation mission of the Refuge System.

Clean Water Act (33 U.S.C. 1251-1387 as amended) 1970. This law, passed in 1970 and amended frequently, gives authorities and responsibilities for restoring and maintaining the chemical, physical and biological integrity of the nation's water.

Clean Air Act (42 U.S.C. 7401). An act requiring the states to attain and maintain a national ambient air quality standard adopted to preserve health and welfare. The Act includes encouragement to states to create smoke management programs to regulate the impacts of wildland and prescribed fire.

Department Manual (Interior Part 620 DM Chapter 1). This manual describes the authorities and responsibilities for fire management within the Department of Interior.

Agency Manual (Fish and Wildlife 621 FW Chapter 1). This manual describes the policy and responsibility for fire management providing objectives, definitions, and responsibilities for managing Fish and Wildlife lands in respect to fire.

The Federal Wildland Fire Management Policy and Program Review (USDA/USDI1995) and Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide (USDA/USDI 1998). These policy and procedure guides provide the framework for fire planning and implementation requiring the FMP to recognize the full range of fire management actions to accomplish state protection and management objectives.

The National Wildlife Refuge Improvement Act of 1997 Public Law 105-57. This act ensures that the refuge system is a national system of related lands, waters, and interests for protection and conservation of the nations wildlife resources.

1.5 Issues and Impact Topics Analyzed in Detail

A resource value or condition that is protected by federal, state, or local laws and regulations, executive orders and USFWS policy can be an impact topic. Impact topics can also be a unique, or limited, national, regional, or local resource or value. The impact

topics discussed below represent the individual resources that potentially can be impacted on the ORINWR by the proposed action.

Health and Safety – Fire management of all types poses a risk to the safety of firefighters and the public. Wildfire may jeopardize life and property, posing a risk to the firefighters attempting to suppress it. The development of wildland urban interface in proximity to the ORINWR poses a threat from fire to the public.

Prescribed fire will create smoke that is harmful to susceptible individuals. Loss of control of a prescribed fire can create the same potential as discussed above.

Vegetation-Fire is used to kill certain species and enhance others. Wildfire is indiscriminate in its passage and may kill desirable species. Prescribed fire may be successful or unsuccessful in managing target species. Desirable vegetative outcomes may or may not be created.

Soils-Soils can be affected by the passage of fire. Consumption of layers of humus on the surface can enhance runoff and heat from the passing fire can produce chemical and physiological changes in the soil. Exposure of bare soils in an effort to enhance generation may be a desirable outcome.

Heritage Resources -Heritage resources of the historical period may be damaged by fire. Older, prehistory resources may be exposed with the potential for unauthorized collection.

Air Quality-Smoke from all types of fire may impact surrounding communities. Visibility impairment from smoke may produce traffic hazards.

Wildlife-Wildland fire can impact various species of wildlife: slow moving animals may be trapped and birdlife may be killed particularly during nesting season.

Threatened, Endangered, or Sensitive Species-Given the multitude of species of concern, it is possible that prescribed fire or wildfire would impact some of them.

Wetlands and Water Quality-Wetlands and water quality may be affected by fire consuming vegetation and by runoff from burned areas. Charcoal from burned vegetation as well as displaced soil may create turbidity.

1.6 Issues and Impacts Considered and Dismissed from Further Consideration

The following issues are often pertinent in other analyses but are eliminated from consideration for the reasons stated.

Wilderness Character-There is no designated wilderness on the ORINWR.

Prime and Unique Farmlands-Some of the lands adjacent to the ORINWR meet the classification of Prime and Unique Farmlands as directed by the Council on Environmental Quality. Since no activity affecting farming or the change in status of this land or development is planned, effects on this item are not analyzed.

Socioeconomics-Implementation of prescribed fire and suppression of wildfires may create minor disturbance in the pattern of life in adjacent populations. Access to recreation may be temporarily limited and in the worst case event, evacuations of residences might be required. This represents such a remote possibility that it is eliminated from further analysis.

Environmental Justice-Assessment of the impacts of this proposal were compared with the requirements of Executive Order 13045. This Order requires federal actions to be compared to the standard of addressing disproportional adverse health or environmental effects on minority or low income populations. This assessment poses no disproportionate impact on any population and is small and temporary enough to eliminate this requirement.

Native American Traditional Values-No activities associated with this proposal will impact Native American traditional values. Fire is a passing event that will have limited impact on the environment as a whole. Heritage Resource evaluation will identify any sites to be avoided thereby eliminating impact to the sites.

Noise-Noise associated with this project will not rise above the ambient level in the valley. This is an industrial area with regular truck traffic, aircraft and motor vessel noise. Prescribed fire and firefighting activities will contribute to this noise level but not substantially and will do so for very short periods of time. Since there will be no noticeable impacts, this item is eliminated from further consideration.

Waste Management-There are no impacts, management, or creation of waste or a requirement of waste disposal. This item is eliminated from further consideration.

Transportation-While there may be temporary closures associated with prescribed fire and fire suppression, these will be infrequent in nature. The few fires that occur on the Refuge make restriction of transportation an issue to be set aside.

Utilities- There are no activities planned that would significantly or frequently disrupt utility corridors around the Refuges. This item is dropped from consideration.

2.0 ALTERNATIVES

Four alternatives were considered in this document. They are:

- Alternative A No Action
- Alternative B Proposed Action /Preferred Alternative

- Alternative C Wildland Fire Use
- Alternative D No Management

2.1 Description of Alternatives

Alternative A. No Action Alternative

This alternative would leave the management of wildfire in the same state that it is today. All fire would continue to be suppressed with the objective being suppression of the fire at one acre or less and within 24 hours of ignition. Further, suppression would not be constrained by cost containment considerations. The no action alternative would cause the Refuge to fail to meet the requirements of managed wildland fire as stated in the 2001 Federal Wildland Fire Management Policy and echoed in agency direction in FWS.

The no action alternative would prevent the Refuge from using prescribed fire on the ORINWR. Absent the option of planning and executing prescribed fire, the Refuge would be unable to implement the full range of treatment options for the control of invasive species and the promotion of species that are enhanced by fire.

Alternative B. Proposed Action/ Preferred Alternative

This alternative would suppress wildfires utilizing Appropriate Management Response (AMR). The alternative would also implement the use of prescribed fire and manual/mechanical fuels reduction to meet resource goals of the refuge.

Under Alternative B, guiding principles of the 2001 Federal Wildland Fire Management Policy will be incorporated into the Refuge's FMP. Specifically, the statement that "...fire management plans must be economically viable, based on values at risk, be cost effective, and be based on land and resource management objectives," would be met.

Under Alternative B, suppression operations will be conducted using Appropriate Management Response (AMR). Suppression decisions regarding initial action, placement of firelines, and use of mechanical or aviation resources would be made commensurate with firefighter and public safety, values at risk, and cost consideration.

Under Alternative B, prescribed fire would be introduced at various locations in the Refuge with the objective(s) of eradicating invasive species, opening areas infested with invasives for supplementary treatment, and enhancement of species that benefit from fire.

Prescribed fire projects would undergo planning and preparation of a Burn Plan. This plan would dictate location and extent of the burn, objectives, tactics, monitoring, and mop up and patrol to extinguishment.

These projects typically require personnel on the ground with a combination of hand tools and drip torches for spreading fire. Small to medium size fire engines or pumps and hose lays are used to pump water for control and extinguishment.

Under Alternative B, mechanical and hand treatments would be used in conjunction with prescribed fire. Cutting, mowing, and hand grubbing would be used to prepare areas for prescribed fire and to reduce fuels around refuge facilities.

2.2 Mitigating Measures

A review of NEPA Regulations in (40 CFR 1508.20) shows that mitigating measures can take the following forms: *www.ceq.eh.doe.gov/NEPA*.

Avoidance- Avoid the impact altogether by not taking a certain action or part of an action.

Minimizing- Limit the degree or magnitude of the action and its implementation.

Rectifying – Repair, rehabilitate, or restore the affected environment.

Reducing or eliminating the impact – Lessen the effect of the impact over time by preservation and maintenance operations during the action.

Compensating – Replace or provide substitute resources or environments.

Application

1) Firefighter and public safety are the stated first priority of management on this and all other federal lands. Mitigation of safety issues will take the following form:

- Temporary restriction of access to portions of the Refuge due to fire suppression or prescribed fire activities.
- Posting of "smoke ahead" visibility signs or flag persons to alert traffic to potential visibility problems.
- All fire operations will be conducted by fully trained and qualified individuals. Annual refreshers will be conducted and assurance made that all personal protective equipment is issued and used.
- Safety briefings will be done and recorded prior to all operations.

2) In areas where species of concern are present, consultation with the Refuge Biologist will be done during the planning phase to identify avoidance requirements.

3) To minimize smoke impacts, burning will be conducted under permit with the appropriate State air quality authority. Burning will be designed to ventilate smoke when good mixing heights can be reached.

4) On fires requiring rehabilitation (rehab) activities, rehab of the site will be done promptly and in consultation with the Regional Fire Management Office..

2.3 Environmentally Preferred Alternative

The Council on Environmental Quality (CEQ) regulations for implementing NEPA requires that the Record of Decision (ROD) specify "the alternative or alternatives which are considered to be environmentally preferable (CFR 1505.2(b)). The environmentally preferred alternative has been interpreted to be the alternative that will promote the national environmental policy as expressed in NEPA's Section 101.

Ordinarily this means the alternative that causes the least damage to the biological and physical environment. It also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources.

Under Alternative A No Action, lack of a clear direction in implementing Appropriate Management Response leaves firefighters without direction in safe, effective and resource responsible suppression. Deliberation and adoption of cost efficient alternatives with lower resource impacts is a preferred method of suppression when compared to all out suppression at minimum acreage.

Under Alternative B, Proposed Action the implementation of AMR will provide firefighters the ability to manage suppression effort, avoiding costly or environmentally damaging suppression tactics. Developing safe, effective tactics that take into consideration the resources to be protected will provide a more cost effective and environmentally sound solution.

Of equal or greater value is the opportunity to utilize prescribed fire to aid in the effort to suppress invasive species. The Proposed Action Alternative will allow planning and implementation of prescribed fire to control invasives and enhance native species providing for a return to a more natural woodland environment. For these reasons, Alternative B Proposed Action is the environmentally preferred alternative

A summary of impact related topics and the effect on them by alternative is included in Table 2.3 in Appendix B.

2.4 Alternatives Considered and Dismissed

Alternative C. Wildland Fire Use.

One of the options available through the 2001 Federal Wildland Fire Policy is the use of wildland fire. Under this policy, fires of any origin may, under selected circumstances, be allowed to continue to burn to accomplish desired objectives. The ORINWR has opted to dismiss this alternative for the following reasons.

The ORINWR is made up of small areas (22 islands & 3 mainlands) that are surrounded by a heavily populated industrial/urban population. Fire of a long duration would create smoke impacts, potential encroachment onto urban interface settings adjacent to Refuge property and create anxiety among a population not used to the concepts used in managed fire.

Additionally, qualified firefighters and managers must be present to take over a situation where an ignition occurs that is a candidate for wildland fire use. Given that little or no fire has occurred on the ORINWR and that there are no fire personnel stationed there, this alternative is dismissed.

Alternative D. No Management

Under this alternative, no suppression effort would be made. Fires would be allowed to burn without suppression or management. This alternative was abandoned as too risky and failing to meet the goals of the Federal Wildland Fire Management Policy.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The Ohio River Islands National Wildlife Refuge is a series of islands in the Ohio River. These islands were formed from river bed deposition of rock and soil moved during flood events that happened annually since the end of the Ice Age. Variations in river flow created reductions in the speed of the water causing sediment of a variety of sizes to drop out and deposit. Over thousands of years this deposition created islands that exist today.

3.1 Methodology for Assessing Impacts

The methods used for assessing the impacts of this project included on the ground gathering of information, consultation with Refuge staff and others, and research of literature pertinent to the refuge and the resource involved. Direct, indirect and cumulative impacts are discussed for each topic. The analysis was arranged in the following fashion.

Each impact topic to be discussed is in Section 1.5 above. These topics are discussed below and contrasted by alternative. . Each impact topic has varying intensity levels. The following definitions are used to evaluate the impact topics. *Note; impact and effect are used interchangeably in this document.*

Beneficial: A positive change in the condition or appearance of the resource.

Adverse: A change that moves the resource away from the desired condition.

Direct: An effect or impact that is caused by an action and occurs in the same place or time.

Indirect: An effect that is caused by an action that is later in time or further removed in distance but is still relatively foreseeable.

Cumulative: An impact which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions.

Context: The geographic extent of the impact; for example, the impact may be localized or regional in scope.

Duration: Refers to the length of time that an impact would last; i.e. the length of time before the resource is returned to its predisturbance condition or appearance. Impacts may range from a few hours (short term) to three or more years (long term). Time thresholds are based on the observation that short term fire impacts generally resolve themselves in three years or less. Long term effects, such as regeneration of trees or rebuilding of soil structure fall into longer term impacts.

Intensity: Refers to the magnitude of the impact. Four thresholds are described that apply to the analysis of the impact in each of the alternatives. They are: negligible, minor, moderate and major. Table 3.1 below outlines these thresholds.

Table 3.1 Thresholds of Impact

Threshold Value	Negligible	Minor	Moderate	Major	Duration of Impact
	Resource would not be affected or only slightly affected. Impacts would be limited to individual items or entities.	Changes to resource would be localized, measurable, and limited to one species or occasion or item. There would be little consequence to the overall quantity or quality of the resource. Mitigation to remedy or minimize the effect would be effective.	A large segment of one or more resource attributes or populations would be affected over a relatively larger area. Mitigation would be extensive but likely effective.	Considerable impact on the resource over a large area. Mitigation to correct impacts would be extensive with success not assured. Impacts may be harmful or beneficial.	Short term impacts refer to a period of three years or less. Long term impacts are three years or more.

3.2 Cumulative Effects Analysis

The Council on Environmental Quality defines Cumulative Effect in 40 CFR 1508.7 as "*the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions*".

3.3 Impairment Analysis Method

Agency rules require managers to analyze potential effects to determine whether or not actions would impair refuge resources or values. A prohibited impairment is an impact that in the professional judgment of the manager would harm the integrity of refuge resources or values.

Refuge managers must seek ways to avoid, or to minimize adverse impacts on resources and values. Laws do give management the discretion to allow impacts to refuge

resources and values when necessary and appropriate to fulfill the purposes of a refuge as long as the impact does not constitute impairment of the affected resources and values.

Based on a thorough analysis of the planned activities, implementation of the preferred alternative would not result in major, adverse impacts to the resources or values of the Refuge.

3.4 Impact Topics Analyzed

Soils/Geology

The geology of the river basin is a gently sloping plateau of horizontal sedimentary layers of sandstone, shale and limestone. The bed of the Ohio River is deep deposits of sand and gravel. The overall picture of the basin is one of a severely altered ecosystem due to impoundment for year-round navigation.

Since the river valley has been settled, the damming of the river and its tributaries for industrial traffic has changed conditions. Annual flooding of the magnitude that produced the islands has been eliminated. Flooding does occur but not in the strength that previously created the deposition that maintained or increased island area. Anecdotally, the river depth averaged less than a foot during the summer prior to damming. Today it is over twenty feet deep to allow the year-round passage of barge traffic.

Numerous islands in the river were reduced due to mining the sand and gravel for industry or by changes in river flow. Twenty islands existed in the ORINWR area that are now gone.

This discussion sets the stage for the affected environment as there are numerous non-fire issues associated with the refuge. Central to this idea is that the islands are irreplaceable. The mechanism that created and maintained them (flooding) is gone and will not return. One of the goals of the refuge is to minimize the loss of further acreage on the islands. Most of the soils are classified as fine sandy silt or silt loam, resting on a sand and gravel subsoil.

Impacts of Alternative A- No Action

Impact analysis: The primary effect of No Action on the ORINWR fire program when it relates to soils is the continued expansion of invasive plants. The occupation of sites by plants kills the overstory woodland or prohibits it from regenerating when a microsite is vacated. Over time this could result in loss of woodland timber cover. Tree root systems aid in holding the soils in place. Absent the root systems, erosion is exacerbated.

Absent the direction and implementation of AMR, the potential for damage from suppression actions remains. Mechanical construction of firelines would pose a threat of soil erosion and runoff that would be harmful.

Cumulative Effects: Loss of soils from erosion is a cumulative effect resulting from lack of effective control of invasives, woodland overstory reduction, flooding and potentially fireline construction. Effects on the Refuge would be minor to major and long term.

Mitigation Measures: The only mitigation possible in the No Action Alternative is to implement Minimum Impact Suppression Techniques. Known as MIST, these actions call for an evaluation of the magnitude and scope of fire and an adjustment of tactics to fit the situation. Highlights of this technique include:

- Minimize fireline to the width and depth necessary to stop the fire.
- Consider wet line to hold the fire and mop up completely to extinguish the fire.
- Utilize natural firebreaks, such as rivers, to stop the fire.
- Locate water pumping operations where fuel leakage is controlled. Utilize pump fuel barrier dams.
- Use retardant only as a last resort. Helicopter operations inland from waterways are the only place possible for its use.
- Restore area concurrent with mop-up. Install water bars in firelines or cover firelines completely. Scatter brush over extinguished area. Consider seeding.

Conclusion: Alternative A would result in minor to major effects of potentially long term duration. The effect of not doing an operation is often more devastating than the operation itself.

Impacts of Alternative B- Preferred

Impact Analysis: Under this alternative, prescribed fire would be utilized to aid in the control of invasive species. While it does not represent a one stop solution, the use of prescribed fire, when combined with other treatments, presents a better option for their control. Prescribed fire would also enhance certain native and desirable species through promotion of vigor and thinning of competition.

Direct and indirect impacts of prescribed burning would be minor. Some soil exposure would occur but it would be followed up with revegetation.

Mechanical or hand treatment would have a minor beneficial impact. Relatively small areas would be treated at one time.

Cumulative Effects: The impacts of fuels treatment and fire suppression under AMR would be beneficial over time. Solving the treatment of invasives and then maintaining their eradication on sites over a period of time would be cumulatively beneficial. Implementing sound fire suppression decisions using MIST would aid in a negligible fashion due to the small area likely to burn.

Mitigation Measures: Mitigation in terms of soil resources is as follows:

- Implement MIST Techniques.

- Minimize consumption of humus layer (duff) to avoid soil exposure.
- Rehab fire lines when finished.

Conclusion: Alternative B would have a beneficial effect on soils resources. Impacts from prescribed burning would be negligible and of short duration.

Water Resources

Discussions with the Refuge Biologist and descriptions in the Comprehensive Conservation Plan indicate that water quality is generally good. The Ohio River is one of the success stories of the Clean Water Act, changing the quality of the water from poor to good.

Problems remain with deposition of sediment on areas where fish and shellfish reside but there are numerous indications that water quality is improved. Organic compounds and heavy metals found in aquatic species have declined substantially and the waterway is regarded as capable of sustaining a viable aquatic community.

Impacts of Alternative A- No Action

Impact Analysis: The effects of continuing management in the current fashion are probably negligible. Some sedimentation may occur as soil is removed from the islands but as a percentage of all sediment it is probably small. The size of the Ohio River Basin is much greater than the size of the islands. Construction, excavation, runoff and other sources likely contribute more to sedimentation than the islands. Effects would be direct, adverse and negligible.

Mitigation Measures: In the rare event category, a large wildfire would require a rehab plan as a separate document.

Cumulative Effects: No cumulative effects in regard to water quality are anticipated.

Conclusion: Direct and indirect effects to water quality from this action would be adverse and negligible.

Impacts of Alternative B- Preferred

Impact Analysis: Wildland fire under this alternative would remain at a very low level in numbers and acreage. Prescribed fire could contribute potential sedimentation and organic material to surrounding water. This would be a short term effect of negligible impact. Proper mop up and water barring would quickly stop any sediment runoff.

Mitigation Measures:

- Locate firelines for prescribed fires and wildfires to prevent runoff into river or back bays.

- Conduct prescribed burns in areas where runoff would be limited, i.e. away from shorelines.
- Avoid use of machinery for firelines.
- Rehab firelines and burn areas rapidly following extinguishment of fires.

Cumulative Effects: No cumulative effects are anticipated.

Conclusion: Short term effects would be adverse, direct and negligible. Long term effects would be beneficial, direct, and negligible in that reestablishment of native vegetation would slow down erosion leading to less stream turbidity.

Air Quality

Air quality remains a heavily impacted resource in the ORINWR. Studies in Washington County Ohio, across the river from the Refuge Headquarters, discuss increased levels of manganese from airborne sources. The county was named as a non-attainment area in 2001 due to that pollution source.

On a larger scale, emissions from coal fired electricity plants and chemical manufacturing plants release large amounts of PM 2.5 (particulates of a size 2.5 microns or smaller) and Nitrous Oxide, the leading contributor to Ozone.

While all of these contribute to poorer air quality, the CCP lists the air quality on the Refuge as meeting the standards for the six "criteria pollutants," ozone, carbon monoxide, sulfur dioxide, particulates, lead, and nitrogen oxides.

There are no federally designated Class I visibility areas in the area surrounding the Refuge. The visibility requirement for the Refuge is Class II which represents the normal requirement for visibility.

Impacts of Alternative A- No Action

Impact Analysis: Direct impacts to the airshed from this alternative are minimal. Few fires occur and have been of small size. Fire will likely be a once in a decade event. When fire occurs, it would contribute smoke and particulate matter into the airshed. Effects would be adverse, direct in its immediate effect on the ambient air quality, localized and negligible in impact.

Cumulative effects: Given the rarity of the event, wildfire contribution of smoke to air quality would be adverse but negligible.

Mitigation Measures: As all fires are unwanted under the No Action alternative, aggressive suppression would eliminate smoke as rapidly as possible.

Conclusion: Direct and indirect impacts on the surrounding airshed would be adverse but negligible in scope.

Impacts of Alternative B – Preferred

Impact Analysis: Activities resulting from implementation of Alternative B would produce more smoke than the No Action alternative. Additional impacts from PM 2.5 (particles 2.5 microns and smaller) would contribute in some fashion to regional haze and health issues. Given the small program planned and the infrequency of burns, the effects, while adverse, would be direct, localized and negligible.

Cumulative effects: Cumulative effects would require input of smoke from refuge fire to interact with regional pollution and create a worse condition. Smoke production from prescribed fire is sporadic whereas point source pollution from surrounding industry is daily. The effect of the small and infrequent smoke production, either from wildfires or prescribed fire would be negligible and short term. Duration of impact would be short.

Mitigation Measures:

- Minimize particulate emissions by selecting cured fuels and drier conditions.
- Manage all prescribed fire through permitting from state air quality agencies.
- Mop up and extinguish fires rapidly at completion of burn.
- Consider timing to avoid evening and nighttime burning when inversion is present.
- Specify wind vectors in plans which will avoid impacts to nearby population centers and heavy traffic areas,
- Utilize signs to alert traffic to smoke on roads.

Conclusion: The effects of smoke from prescribed fire and wildfire managed with AMR would be adverse, short duration, local and negligible in impact.

Vegetation

There are approximately 500 species of plants on the Refuge. Those listed here are common to all the areas we looked at and represent the spectrum of species of plants in consideration with this plan.

There are two vegetation types that are pertinent to the discussion of fire on the ORINWR. The first of the types of vegetation is climax bottomland hardwood forest. Through time, the mechanism that appears to drive change is flooding. Disturbance of the vegetation on the island appears to be attributable to flooding which takes out portions of the vegetation without exposing large areas of open land. Trees that reoccupy the sites are shade tolerant species typical of a climax forest. Absent fire or windstorm to create large scale openings the forest simply regenerates itself.

On the lowest elevation of the islands, damp soils lend themselves to the propagation of silver maple, *Acer saccharinum*, cottonwood, *Populous deltoides*, black willow, *Salix*

nigra, river birch, *Betula nigra,* black locust, *Robinia pseudo-acacia,* and sycamore, *Platanus occidentals.*

Higher in elevation on the island, which is often a gain of only a few feet, are overstory hardwoods that prefer somewhat drier sites: wild black cherry, *Prunus serotina*, hickories, *Carya spp.,* sweet buckeye *Aesculus octandra*, and box elder, *Acer negrundo.* Grasses of note include Virginia wild rye, *Elymus virginicus,* and deer tongue grass, *Panicum clandestinum.*

The understory of this woodland is composed of shrubs, notably paw-paw, *Asimina triloba,* wingstem, *Verbisina alternifolia,* poison ivy, *Rhus radicans,* spicebush, *Lindera benzoin,* and wild grapes, *Vitus spp.*

The understory is also occupied by numerous invasive species. The most notable of these are, Japanese hops, *Humulus japonicus*, silvergrass, *Miscanthus sinesis,* Japanese Knotweed, *Polygonum cuspidatum*, mile-a-minute, *Polygonum perfoliatum*, and one isolated outcrop of kudzu, *Puereria lobata*. These species have invaded the islands in profusion occupying every available site. The Japanese hops and mile-a-minute overgrow shrubs and trees in a dense fashion eventually killing the tree.

The other type of vegetation common to some of the islands is called "old field". These are areas that had been farmed at one time or otherwise cleared and have been allowed to grow back since their incorporation into the Refuge. Several stages of vegetation treatment aided by replanting efforts will be necessary to achieve the stated goal of reestablishment of overstory species.

The areas are occupied by grasses and herbaceous species such as, goldenrod, *Solidago spp.,* thistle, *Cirsium spp.*, reed canary grass, *Phalaru arundinacea,* and ragweed, *Ambrosia artemisifolia.* Other larger species include, black raspberry, *Rubus occidentalis,* rose, *Rosa spp.* dogwood, *Cornus spp*., and black elderberry, *Sambucus canadensis,*

"Oldfield" is not immune to invasive weed infestation. Japanese knotweed seems to do less well in the open but mile-a-minute and Japanese hops can rapidly outcompete native vegetation. In addition, one island, Buckley, has a population of silvergrass, *Miscanthus sinensis.* This species apparently established itself on the island below the I-77 Bridge from seed blown from passing trucks. It has spread rapidly and is replacing native vegetation.

Some of the "old field" has been replanted on Middle Island. Small diameter trees are forming a regrown forest with some success. Regeneration strategies modeled after this effort will be crucial to controlling invasive species.

Lower portions of the "old field" that flood periodically are open fields in the dry season, composed largely of common burdock, *Arctium minus* and white heath aster, *Aster pilosus,* and common cocklebur, *Xanthium strumarium.* These areas are not large in size but are noteworthy as they will form the basis for some of the first prescribed burns.

A literature search was completed prior to writing this document which outlines the species listed above and their estimated response to fire. Conclusions are as follows:

- Most of the overstory trees in the lower elevations (maple, sycamore, cottonwood, and others) do not fare well in the presence of fire. These are soft wood species with thin bark that either die from cambium kill or from fire entering wounds or openings and burning its structure to the point of collapse.
- Understory species (paw-paw, spice bush) fare poorly as well. They do not sprout readily after fire.
- Several species adapt well to fire, notably, aster, pin cherry, and Virginia wild rye. Pin cherry is of value as it regenerates rapidly after fire and is a key species used for regeneration of "old field".
- Much of the literature is inconclusive regarding the invasive species however, it is noted that Japanese knotweed, mile-a-minute bush and silvergrass would respond to fire as part or all of a treatment.

Impacts of Alternative A-No Action

Impact Analysis: The impacts to vegetation are probably the most obvious for the No Action Alternative. The treatments for invasive species have been of limited success to date. Continuing the effort of vegetation management without the use of prescribed fire will likely result in continued expansion of invasives and the decline of desirable hardwoods. Impacts to vegetation would be direct and indirect, adverse, localized and major. There would be potential loss of large areas with no assurance of success through mitigation.

Cumulative Effects: Loss of vegetation through wildfire will happen infrequently regardless of alternative. No cumulative effect is likely through wildfire. While there is a potential loss over time of seed source for native species, the loss of desirable species through invasion of unwanted ones is more of a direct effect than a cumulative one.

Mitigation Measures: There are no actions planned other than continued suppression under this alternative. Mitigation would be to implement MIST techniques in suppression.

Conclusion: Vegetation is one of the principal reasons for the analysis. No action in dealing with vegetation could result in long term, major, and adverse effects.

Impacts of Alternative B -Preferred Alternative

Impact Analysis: Under the preferred alternative, prescribed fire would be implemented with the objective of managing vegetation to enhance desirable species and to aid in limiting the spread of undesirable or invasive species. The use of prescribed fire or hand or mechanical treatment should be regarded as an adjunct to other treatments. When fire consumes plants, cutting of successive sprouts by hand then reestablishing desirable

seedlings is a follow up operation. When hand cutting severs stems and creates cured fuels, prescribed fire consumes the dead vegetation and seed source. These are only two of numerous examples where multiple efforts are necessary to handle vegetation.

Direct and indirect effects of introducing prescribed fire to the refuge would be beneficial, localized and minor. Duration would be both short and long term. Short term effects would be loss of desirable vegetation through fire mortality. Long term effects would be establishment of vigorous stands of mature hardwoods capable of out competing the invading species.

Cumulative Effects: Little effect is anticipated from wildfire on the Refuge. The cumulative effect of prescribed fire will, when combined with other treatments, provide an expanding network of areas regenerated with desirable vegetation. Effects will be beneficial, minor, and long term.

Mitigation Measures: Mitigation measures for treating fuels using prescribed and mechanical treatments are:

- Conduct recon during burn plan preparation to avoid treating species that don't profit from fire, including species of concern.
- Prescribe environmental parameters (fuel moisture, dry weather conditions) that will lead to rapid complete combustion.
- Mop up burns promptly to minimize smoldering combustion
- Utilize AMR in making suppression decisions, giving due consideration to safety, resources and values at risk, cost effectiveness, and potential benefits.

Conclusion: Alternative B Preferred has more effect on vegetation than any other resource. Its effects will be long and short term, beneficial, and over time, minor to moderate in intensity.

Wildlife

There is a diverse group of mammals, reptiles, and amphibians that occupy the islands of the ORINWR. Beaver, fox squirrel, raccoon, mink, muskrat and river otter occupy the transition between land and water. Various toads, snapping and other turtles, snakes and frogs also occupy the transition area.

The drier areas of the islands are populated with white-tailed deer, gray and red fox, eastern cottontail rabbit and opossum. The area that is still "old field" provides edge effect habitat for deer, white-footed mice, voles, rabbits, and the predators that feed on them. A complete listing of the animals of the Refuge is available in Appendix D in the Comprehensive Conservation Plan (CCP).

The birds in the Refuge are conspicuous. Appendix D in the CCP also provides a complete list of birds. There are over 200 species of birds that utilize the Refuge at some point in the year. Many are Neotropical, passing through the Ohio Valley on their way

north and south. The river corridor is a key feature for resting and feeding for these species.

There are 78 different species that are known to nest on the Refuge. Six species are noted both in the CCP and in the Partners in Flight, Species of Concern. They are noted here:

- Acadian flycatcher *Empidonax virescens*
- Field sparrow *Spizella pusilla*
- Wood thrush *Hilocichla mustelina*
- Cerulean warbler *Dendroica cerulean*
- Prairie warbler *Dendroica discolor*
- Kentucky warbler *Oporornis formosus*

Partners in Flight lists 33 Species of Concern as having ties with the state of West Virginia.

Additionally there are three Federal species of concern that occupy the Refuge. These birds are not currently listed as threatened or endangered but their recovery and maintenance is important and they have key habitat on the Refuge.

Bald Eagle, *Haliaeetus leucocephalus*- Reports of nests on Phillis Island are being examined. The Bald Eagle was removed from federal listing in 2007.

Great Blue Heron, *Ardia herodias*- There are heron rookeries (nesting structures) on Wells, Fish Creek, Muskingum, and Grape Islands.

Osprey, *Pandion haliaetus*- There are nesting platforms on Grandview, Neal, and Muskingum Islands.

Impacts of Alternative A- No Action

Impact Analysis: Absent the opportunity to include prescribed fire in the range of treatments, the progress of invasive species will continue. Implementing prescribed fire doesn't guarantee the elimination of unwanted vegetation but it adds a tool to the array used to combat them. Left to the present method of treatment, the effort to control these species will continue to fall behind. Each of these unwanted species takes over habitat occupied by native vegetation. As this vegetation declines, the habitat for the species listed will be reduced as well. Effects of no action will be direct, adverse and minor to major to wildlife.

Cumulative Effects: No cumulative effects to wildlife are anticipated.

Mitigation Measures: The only mitigation measure possible under this alternative is rapid suppression of fires to minimize burned acreage within the Refuge.

Conclusion: The effects of the no action alternative on wildlife allow for the continuing slow decline of native vegetation. Absent this vegetation, habitat for several key birds may decline. Effects could be adverse, long term, and minor to major.

Impacts of Alternative B- Preferred

Impact Analysis: The effect on wildlife through this alternative is a mixed result. Prescribed fire or wildfire under AMR will include more acres than the No Action Alternative. Short term losses may be to habitat, nesting, and occasionally, small animals unable to escape the burning operation. These impacts will be adverse, negligible, short term and localized. Longer term, the effects of burning will potentially move the habitat back to a more native population of plants, a direction bound to benefit all types of wildlife.

Cumulative effects: No cumulative effects from fire are anticipated.

Mitigation Measures:

- Survey for species of concern. If avoiding nests through timing of burns is deemed appropriate, do so.

Conclusion: The effects of Alternative B on wildlife would be short and long term, negligible to moderate, and localized. The overall long term benefit would be beneficial, with minor to moderate impact.

Threatened, Endangered and Sensitive Species

There are three federally listed species that reside on the Refuge for some portion of the year. Two of these are mollusks and one is a mammal.

The pink mucket mussel, *Lampsilis abrupta,* and the fanshell mussel, *Cyprogenia stegaria,* are members of the freshwater mussel group that inhabits the water surrounding the islands. The 1,700 plus acres that are federally owned beneath the water level of the river are home to 38 species of mussels. Water quality in the river is a key consideration of the Refuge because of this.

The Indiana bat, *Myot*is *sodalis,* is a summertime visitor to the Refuge. The aquatic habitat no doubt gives rise to plentiful insect life providing a food source that attracts the bats. Caddis flies and terrestrial insects make up a major portion of their diet.

The summertime habitat for the bats is roosting in tree cavities or under loose bark on mature trees. These bats forage in the upper canopy of the forest. The bats winter far from the Refuge. They prefer the mouths of caves for hibernation habitat.

As indicated in Section 3.6 above, there are three species of concern, Bald eagle, Osprey, and Great blue heron as well as the listed smaller birds.

There are a number of plants listed in Appendix D of the CCP that are Rare, Threatened or Endangered by the state where they reside.

Impacts of Alternative A- No Action

Impact analysis: The continuation of fire suppression and no prescribed fire under this alternative will have few short and greater long term impacts. Short term impacts are a continuation of gain for invasive species. Plant species of concern will continue to be crowded out. Animal species of concern will likely see much change.

Longer term impacts will see a continuation of the change in plant distribution. The loss of mature forest will continue through the removal of dying old trees and lack of regeneration on the site because of competition from invasives. Effects will be adverse, long term, minor to major and local in scope.

Cumulative Effects: There does not appear to be any cumulative effect to species of concern from the No Action Alternative.

Mitigation Measures:

- Any potential disturbance to listed species or habitats would be identified through informal consultation with FWS Ecological Services under Section 7 Of ESA (Endangered Species Act).

Conclusion: Effects from fire suppression on T&E species would be negligible, short term and localized. Suppression impacts should be monitored and avoided.

Impacts of Alternative B- Preferred Alternative

Impact Analysis: The use of fire and the adoption of AMR will likely have a localized effect that is minor in context. Trees of the size and condition to attract bats will be avoided as fire in cavities of large trees will result in structural weakening that can bring the tree down. Fire will more likely be used in open areas where exotic species can be effectively treated.

Runoff from the burns into the river and its effect on mussels should be negligible. These are small burns and the greatest threat is from spilled fuel adjacent to waterways. Impacts may be adverse but they will be short term and negligible.

Long term impacts will be negligible to minor, affecting individuals or small groups of plants or animals. Creation of additional habitat through removal of invasives and reintroduction of native trees will be beneficial.

Mitigation Measures:

- Any potential disturbance to listed species or habitats would be identified through informal consultation with FWS Ecological Services under Section 7 Of ESA (Endangered Species Act).

Cumulative Effects: Cumulative effects on threatened or endangered species pose minimal to no effect.

Conclusion: The impact of the Proposed Alternative B is negligible to positive on Threatened or Endangered species. Mitigation through avoidance of plants that are of concern is possible. Mitigation of Indiana bat habitat is possible through monitoring and avoidance. Long term impacts to species are generally favorable.

Public Health and Safety

The impacts to the public from fire activities consists of smoke that poses a health concern and limits visibility, and fire which may escape the Refuge.

The effect of smoke from prescribed fires or wildfires is a documented health concern. It is also a very visible one that the public focuses concern on. The primary issue is particulates that are inhaled.

While other criteria pollutants are produced during burning, the presence of PM 2.5 (particulate matter <2.5 microns) is a matter of concern for the public. This size particle poses the greatest health risk to humans of any of the size categories of particulate matter.

In a similar vein, PM 2.5 is the greatest contributor to Regional Haze, the layer that limits visibility. PM 2.5 travels great distances and can be a contributor to problems regionally.

Impacts of Alternative A – No Action

Impact Analysis: The effect of continuing in the same management process as today is that there would be few fires and no prescribed burning. There would be no impact from prescribed fire and little from wildfire.

Cumulative Effects: There would be no cumulative impacts from the No Action alternative when compared with public health and safety.

Mitigation Measures: No mitigation measures are necessary.

Conclusion: Impacts to public health and safety would be short term, adverse, direct, negligible.

Impacts of Alternative B- Preferred

Impact Analysis: While the concern for the production of pollutants is valid and substantial, the impact from activities within the Refuge would be small. Impact from burns would be sporadic and wildfire far less given the infrequency of occurrence.

Equally, the concern for escaping wildfire or prescribed fire is limited by the infrequency of either operation and the isolation of most of the properties by river channel. Effects from fire on public health and safety are potentially adverse, direct and indirect, and negligible to minor in the short term.

Cumulative Effects: The production of smoke from wildfire and prescribed fire will be a minor addition to the regional air quality. Given the infrequency of operations or wildfire, the effects will be adverse, direct and indirect, and negligible to minor in magnitude.

Mitigation Measures

- All prescribed fires must be permitted by the Air Quality authority in the state where the burn occurs.
- Planning and execution of burns and operations on wildfire must be conducted by individuals fully qualified by the federal government.
- Conduct burns when fuels are driest to minimize smoke production.
- Plan in conjunction with law enforcement to manage traffic in the event of smoke impact.
- Mop up aggressively at the completion of burns to eliminate smoldering.
- Consider use of head fire to hasten ignition and better combustion.

Conclusion: The preferred alternative would provide increased health to the environment with relatively minor and short term impacts to human health and safety.

Visitor Use and Experience

Conversation with Refuge staff indicates that the majority of the population isn't aware that a federal wildlife refuge exists in the Ohio River Valley. Education by Staff has been one of the important efforts in an attempt to acquaint people with the Refuge. This is paying dividends, generating volunteer staff to participate in management activities.

Recreational use of the islands is heavy with boaters, fishermen, water skiers and campers having used and at times occupied the islands. Temporary shelters and small shacks were frequently constructed in the past on the islands. These are removed as they are found.

Refuge staff report they are making headway in encouraging the public to use the Refuge properly. Birding tours, hunting opportunities, picnicking and sunbathing remain popular.

The use of jet skis and power boats has an unfortunate consequence. In concert with the steady barge traffic, the wakes of all boats continue to place an erosion burden on the islands. The constant lapping of water on the shore causes soil to be washed away. Working with the Army Corps of Engineers, the Refuge has begun placing barriers along the water's edge to combat this. Areas examined this year showed a good potential for success.

Impacts of Alternative A- No Action

Impact Analysis: The impact of Alternative A- No Action would be negligible to minor on the public. There has been an effort to educate the public and to draw support from volunteers for restoration and maintenance efforts on the islands. This has proven somewhat successful. Absent additional opportunities to make a difference in the island ecosystems through proactive work, this support may suffer.

Cumulative effects: There is a potential to accumulate effect through the continuation of No Action. Erosion stems from the loss of root structure coupled with the erosion action of boat wakes. As the mature overstory falls apart and is replaced with lesser species the bare soil on the edges of the islands increases. Effects may be long term, adverse, and minor to moderate.

Mitigation Measures:

- Continue the efforts in place to cut down on erosion through placement of longitudinal dikes along the water's edge.

Conclusion: Visitor Use would be impacted in the long term as unchecked erosion wears away at the islands. Effects would be cumulative, a result of invasive plants affecting overstory trees whose root systems hold the islands together. Impacts would be adverse, long term and minor to major.

Impacts of Alternative B – Preferred Alternative

Impact Analysis: Alternative B would provide prescribed fire as a means to control invasives. This would lead to a more natural, esthetic appearance. Instead of huge thickets of invasive species, normal woodland understory would prevail. Erosion from boat wakes would be minimized through mitigation and soils held together by native overstory. Regeneration of overstory species would occur over time yielding long term effects that were beneficial, direct and indirect, minor to major in magnitude, and local in scope.

Cumulative Effects: Cumulative effects for Alternative B would be the opposite of Alternative A. Erosion would diminish as a function of prescribed fire altering the vegetation makeup. Effects would be minor to major and long term in nature.

Mitigation Measures:

- Continue efforts to place longitudinal dikes along the water's edge to cut down on boat wake erosion.
- Utilize public education to gain support for maintenance of the islands.

Conclusion: The effects of Alternative B would be to promote healthy, natural vegetation that would retain soil on the islands and be resistant from erosion. A natural and more esthetic appearance would attract visitors and encourage volunteerism.

4.0 CONSULTATION AND COORDINATION

4.1 Public Involvement Summary

This EA will be made available at the Ohio River Islands NWR Headquarters, on the refuge website, and notice will be placed in public newspapers with press releases going to the local media.

4.2 Agency Consultation

The process employed for preparation of this document was to conduct scoping in conjunction with preparation of the Fire Management Plan. This was accomplished in October of 2007 during a field visit to the Refuge. Following the scoping, an Interdisciplinary Team was formed on November 2, 2007 consisting of fire management, biology and management specialists to address the findings of the scoping.

4.3 List of Preparers

Name	Contributory Role	Title	Office
Dean Rhine	**Administrative and Management**	**Refuge Manager**	**ORINWR 304-375-2923**
Patricia Morrison	**Biological Impacts**	**Refuge Biologist**	**ORINWR 304- 375-2923**
Rod Hoibakk	**Author, Fire Management Specialist**	**Associate Planner**	**Wildland Fire Associates Rangely, CO 406-579-6043**

4.4 List of Agencies, Governments, Officials, and Organizations Contacted

(Refuge to provide once final document is completed)

5.0 REFERENCES

Dr. Jim O'Donnell, Marietta College; Personal Communication on history of Ohio River Islands, 215 S 5th Street Marietta, Ohio

Ohio River Islands NWR, Comprehensive Conservation Plan, November 2001

Vegetation Management Guidelines, Illinois Natural Preserves Commission, 2/07 (Japanese hops)

Fire as a Tool for Controlling Non-Native Invasive Plants, Rice, 2/2005
Japanese Knotweed on the Batavia-Kill in Green County, New York, Talmage and Kivat 12/2002

Websites referenced:

www.fs.fed.us/database/feis Fire Effects Information System

www.dcnr.state..pa , www.mdc.md.gov Indiana bat

www.astdr.cdc.gov Air quality

www.ohiocitizen.org Air quality

www.wvdnr.gov Air quality PM 2.5

www.epa.gov/visibility Air quality

www.quickfacts.census.gov Human community

www.fedstatrs.gov Human community

www.civilwarhome.com Human community

www.pif.org Species of concern- birds

www.ceq.eh.gov/NEPA NEPA procedures

www.nwcg.gov/glossary Fire Terminology

5.1 Glossary and Acronyms

Appropriate Management Response (AMR) Actions taken in response to a wildland fire to implement protection and fire use objectives.

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Fire Management Plan A document describing the actions to be taken in implementing a fire program. This overall plan links fire management operations and planning with the land management documents of the particular federal parcel of land.

Fuels Burnable vegetation in the wildland.

Mechanical Fuels Treatment- Fuels removed from the wildland by use of machinery. Cutting, chopping, mastication, and chipping are means for this removal.

Minimum Impact Suppression Techniques (MIST)- The use of minimal impact fire suppression options to achieve control objectives on a wildland fire.

Prescribed Fire- Fire purposely ignited by humans under a specific set of conditions to accomplish specific land management objectives.

Wildfire- An unplanned, unwanted wildland fire where suppression is the objective.

Wildfire suppression – An appropriate management response to a wildfire that results in curtailment of fire spread and elimination of threat from that fire.

Wildland Fire- Any non-structure fire that occurs in the wildland. Includes prescribed fire.

6.0 TABLES

Table 2.2 Summary of Mitigation Measures by Alternative

	A. No Action Alternative	**B. Proposed/Preferred Alternative**
Fire Suppression	**1. Monitor Health and Safety Activities for compliance. (*reduce impact)***	**1. Monitor Health and Safety Activities for compliance (*reduce impact)*** **2. Implement AMR. *(reduce impact)*** **3. Consult with law enforcement and air quality authorities. *(reduce impact)*** **4. Consult with Refuge biologist. *(reduce impact, rectify)*** **5. Prepare and follow Wildland Fire Situation Analysis (WFSA). *Reduce impact, rectify)***
Fuels	**1. None**	**1. Monitor Health and Safety requirements for compliance. *(reduce impact)***

Table 2.3. Summary Comparison of Impacts by Alternative

Topic	Alternative A (No Action)	Alternative B (Preferred Alternative
Vegetation	Very few fires occur on the Refuge and their effects on vegetation would be quite small. They would be limited in scope given the small size of an average fire. Trees low in resistance to fire would fare the worst. Greatest potential for impact would be through indiscriminate suppression operations.	Introduction of prescribed fire would have a greater impact on vegetation. Objectives would be to specifically kill or consume portions of the vegetative strata particularly invasive species. Impacts would be short term given the rapid colonization of openings. Long term effects would be the potential to regenerate native species
Soils	Minor short term impacts given the few fires that occur. Potential long term severe impacts given indiscriminate suppression action. Soil displacement and erosion in sandy soils are a potential.	Potential for short term effects through soil exposure following burning. Potential for soil chemistry change if burned too hot.
Health and Safety	Minor and major short term effects and major long term effects would result from fire suppression in its present form. Smoke, presenting a hazard to health would quickly dissipate. Traffic hazards would last only as long as the smoke was present. Major short term and long term effects would be increased hazard to firefighters suppressing fires outside of Appropriate Management Response.	Minor short term effects to this alternative include the same traffic concerns as A. Major short and long term effects to firefighters are minimized by AMR.
Heritage Resources	Minor long term effects to this resource occur when unauthorized collection of exposed artifacts occur during suppression.	Minor short term effects are the potential for loss of historical sites. Minor long term effects are the same as Alternative A.
Air Quality	Minor short term effects to air quality during suppression are possible. Their effect is short term and negligible.	Minor short term effects are possible with suppression under AMR and prescribed fire. Given the size of both programs. The effect would

		be short term and would not contribute to Regional concern.
Wildlife	Minor short term effect to wildlife , disrupting their patterns through suppression. Potential long term effect through loss of habitat due to invasive species.	Minor short term effect through suppression and prescribed fire disturbance. Positive long term effect in controlling invasive species.
Threatened, Endangered and Sensitive Species	Minor effect to listed species. Potential loss of habitat for Indiana bat. Minor effect for sensitive species in loss of nesting habitat.	Minor short term effect in loss of habitat. Potential long term benefit through control of unwanted vegetation.
Wetlands and Water Quality	Minor effect to wetlands through loss of native vegetation to invasives. Minor effect to water quality through runoff of charred organics and sediment.	Minor short term effect from burning to wetlands and water quality. Minor long term effect through improved habitat quality and native species.

7.0 APPENDICES

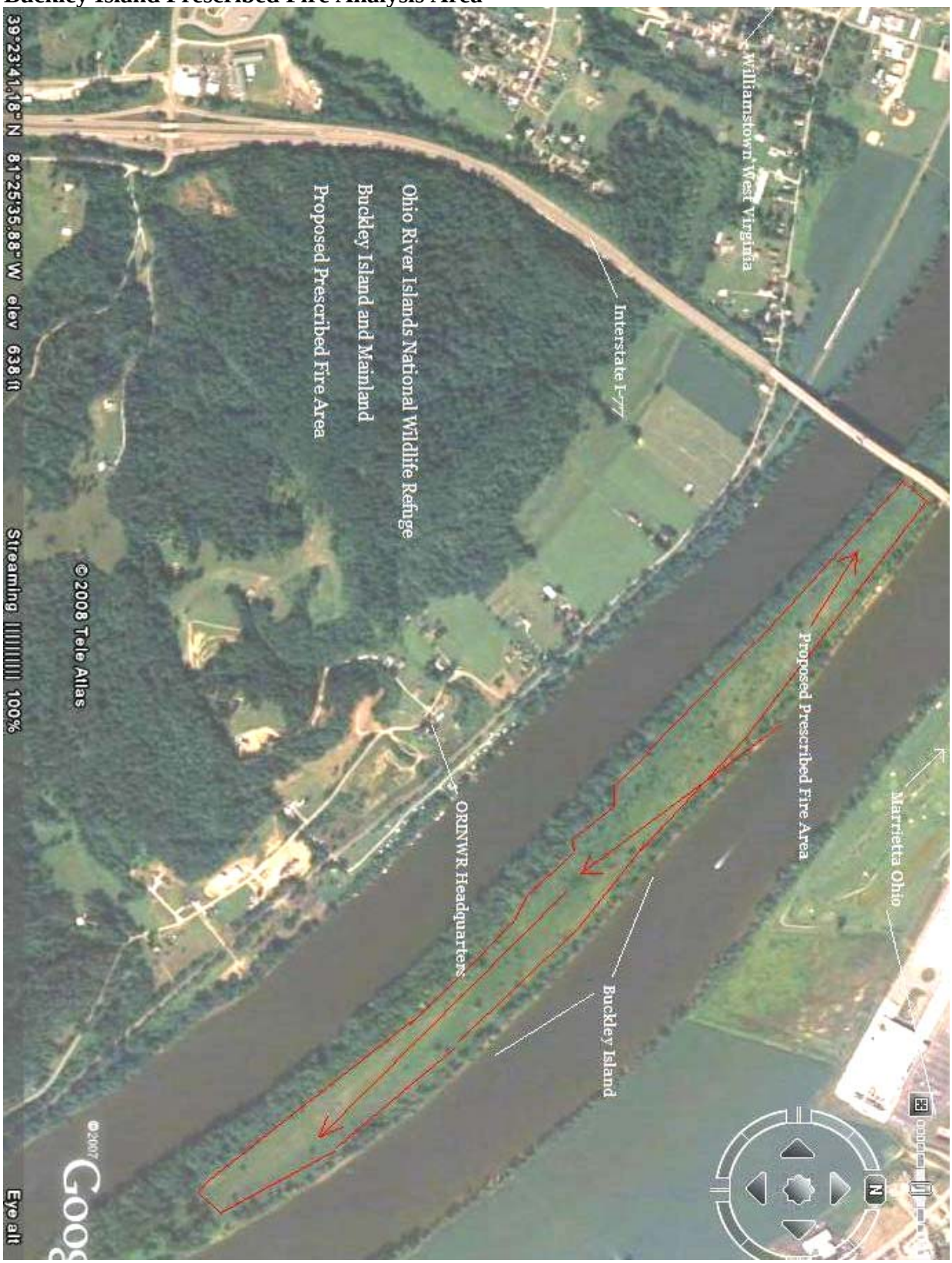
Appendix A. Annual Workplan Ohio River Islands NWR (under revision)

Appendix B. Maps

Note:

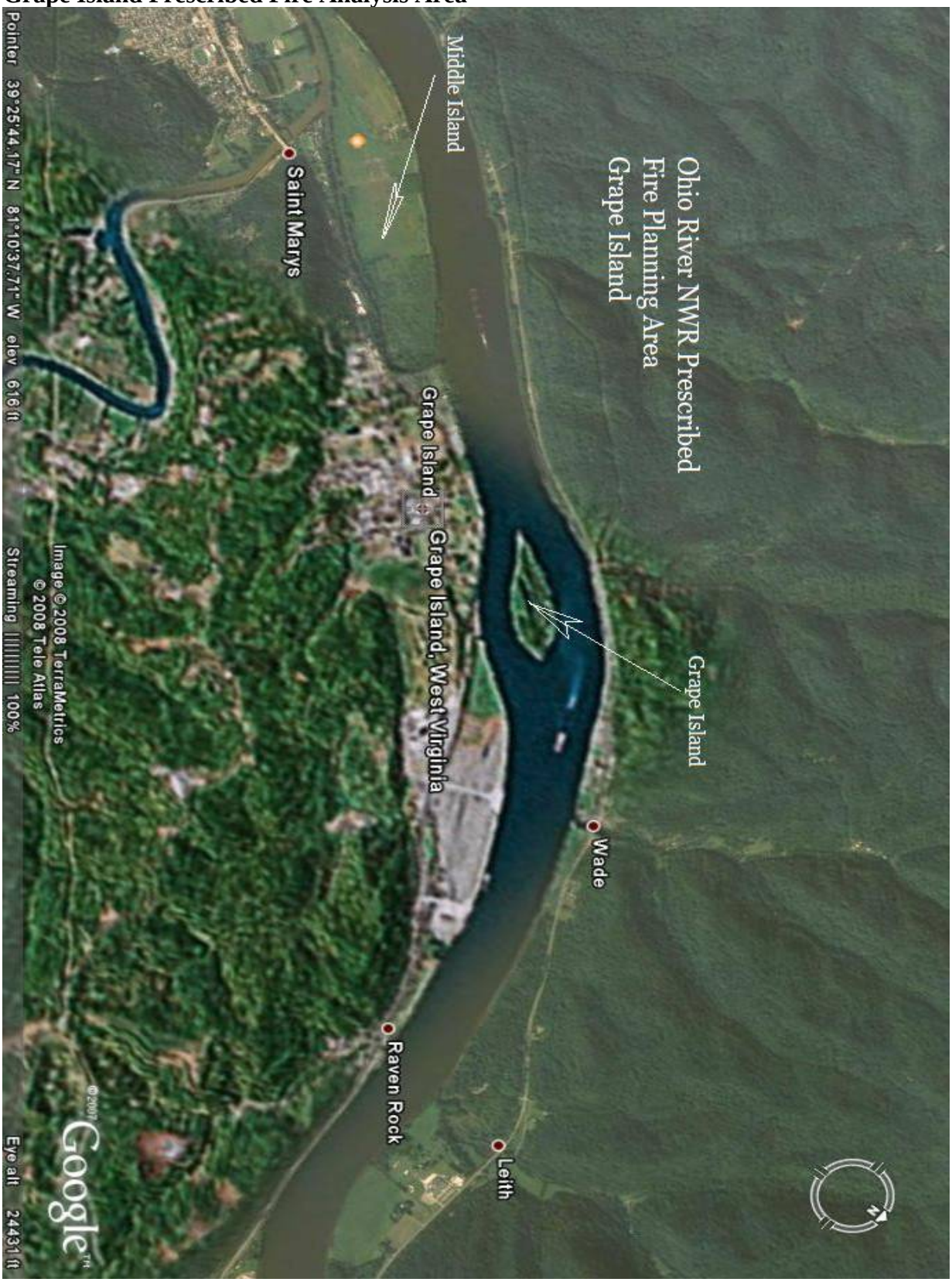
1) The areas noted on these maps are candidate areas only. Final selection of islands and delineation of project areas is a project level planning function.

Buckley Island Prescribed Fire Analysis Area



Middle Island Prescribed Fire Analysis Area

Grape Island Prescribed Fire Analysis Area



Neal Island Prescribed Fire Analysis Area