

U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

ENVIRONMENTAL ASSESSMENT

For

**Collection of Wild Edibles on Mingo National Wildlife Refuge,
Wayne and Stoddard Counties, Missouri**

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Abstract: The United States Fish and Wildlife Service proposes to provide for the gathering of wild edibles (mushrooms, poke and berries) on the Mingo National Wildlife Refuge in Wayne and Stoddard Counties, Missouri that are compatible with the purpose of the Refuge. This Environmental Assessment (EA) evaluates three possible alternatives for gathering opportunities. The preferred alternative would offer compatible gathering opportunities while providing visitors with other priority public use opportunities (i.e., wildlife observation, wildlife photography, environmental education and interpretation).

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Section 1.0 Purpose of and Need for Action

1.1 Introduction

The United States Fish and Wildlife Service (Service) has prepared this Environmental Assessment (EA) to evaluate the effects associated with gathering on Mingo National Wildlife Refuge (Mingo NWR; Refuge). This EA complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 CFR 1500-1509) and Department of the Interior (516 DM 8) and Service (550 FW 3) policies (see Section 1.7 for a list of additional regulations with which this EA complies).

1.2 Location:

The Proposed Action would occur in Stoddard and Wayne Counties, Missouri, within the Mingo Basin on Mingo NWR (Figure 1).

1.3 Background

Mingo National Wildlife Refuge is managed by the U.S. Fish and Wildlife Service (Service) under the Department of the Interior and is a unit of the National Wildlife Refuge System (NWRS).

National Wildlife Refuge System Mission and Goals:

The mission of the National Wildlife Refuge System is (National Wildlife System Administration Act of 1966, as amended [16 U.S.C. 668dd668ee]):

“To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

The National Wildlife Refuge System Improvement Act of 1997 established several important mandates aimed at making the management of national wildlife refuges more cohesive. The preparation of comprehensive conservation plans is one of those mandates. The legislation directs the Secretary of the Interior to ensure that the mission of the National Wildlife Refuge System and purposes of the individual refuges are carried out. It also requires the Secretary to maintain the biological integrity, diversity, and environmental health of the National Wildlife Refuge System.

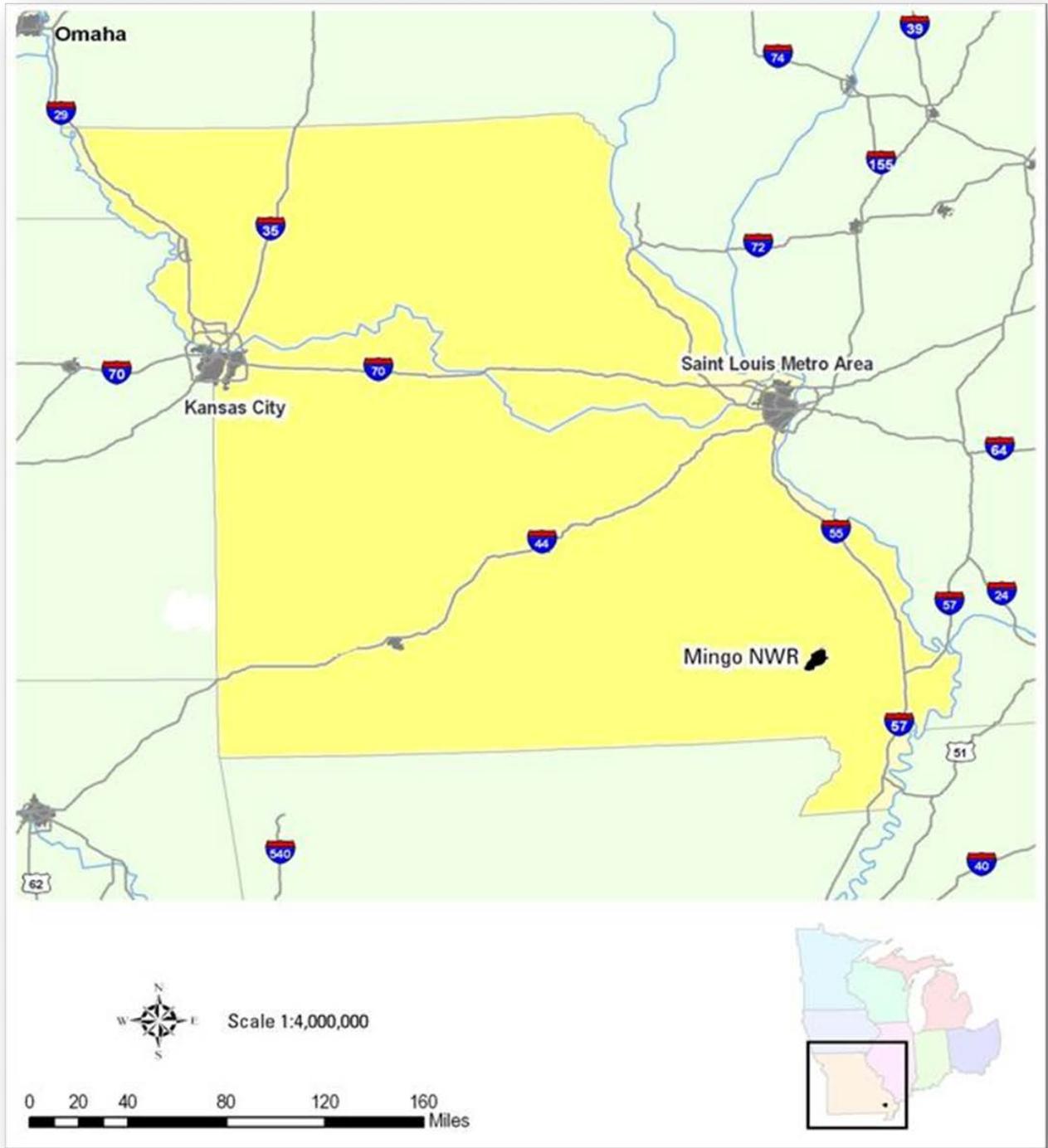


Figure 1. Location of Mingo National Wildlife Refuge, Puxico, MO.

The Refuge System's Mission is to:

- Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered.
- Develop and maintain a network of habitats for migratory birds, anadromous and interjurisdictional fish, and marine mammal populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges.
- Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered.
- Provide and enhance opportunities to participate in compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and environmental education and interpretation).
- Foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.

Mingo National Wildlife Refuge Purposes and Objectives:

Beginning in 1944, land was acquired for Mingo NWR with the approval of the Migratory Bird Conservation Commission. The purpose of the Refuge derives from the Migratory Bird Conservation Act, "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. 715d). In acquiring the first tract for the Refuge, the land was identified as "urgently needed for the protection and conservation of migratory waterfowl and other wildlife." In a 1954 presentation to the Migratory Bird Conservation Commission, the Refuge was described as an "important unit in the Mississippi Flyway" and "an important wintering ground for many species of waterfowl."

One tract of the Refuge was acquired with Bureau of Outdoor Recreation funds. The purpose associated with this funding derives from the Refuge Recreation Act and includes lands "...suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." 16 U.S.C. 460k-1 (Refuge Recreation Act (16 U.S.C. 460k-460k-4), as amended).

An additional purpose was acquired when Congress designated the 7,730 acre Mingo Wilderness in 1976. The establishing legislation for the Wilderness (Public Law 94-557) states that "wilderness areas designated by this Act shall be administered in accordance with the applicable provisions of the Wilderness Act...." The purposes of the Wilderness Act are additional purposes of that part of the Refuge that is within the Mingo Wilderness. The purposes of the Wilderness Act are to secure an enduring resource of wilderness, to protect and preserve the wilderness character of areas within the National Wilderness Preservation System (NWPS), and to administer the NWPS for the use and enjoyment of the American people in a way that will leave

these areas unimpaired for future use and enjoyment as wilderness.

Operational Goals:

The Refuge developed a Comprehensive Conservation Plan (CCP) to provide a 15 year management plan that is consistent with Service policy and legal mandates. The CCP was completed in 2007 and established new operational goals and objectives for wildlife, habitat, and public use. The current project is in compliance with the Mingo CCP. The current proposed changes adjust the gathering area and quantity of wild edibles in the CCP. It maintains that all gathering of wild edibles will continue to be for personal use only.

1.4 Purpose

The purpose of this Environmental Assessment is to evaluate different alternatives for gathering of wild edibles on Mingo National Wildlife Refuge (Refuge).

1.5 Need for the Action

Mingo National Wildlife Refuge protects a remnant of the bottomland hardwood and cypress-tupelo swamp ecosystem that once formed a 2.5 million-acre contiguous natural landscape throughout the Mississippi River basin. The 21,592-acre Refuge represents the largest area in southeast Missouri of remaining habitat for numerous native and threatened plant and animal species. The Refuge touches the southeast boundary of the Ozark Plateau and slopes abruptly from an upland oak-hickory forest to bottomland hardwood forest, lower marsh, and expansive swamp and ditch system. Since the beginning of the 20th century, these lands have been drained and deforested for agricultural purposes, which has highly modified the natural landscapes and ecosystem functions. Guided by legal mandates, the Refuge has successfully pioneered techniques that maintain a delicate balance of preservation and active management strategies for reforestation and hydrological integrity of the natural systems for the benefit of migratory birds, other wildlife, and wildlife-dependent public use. The Refuge is located in a community that appreciates both the natural diversity and the rich biological integrity of the Refuge and the surrounding public and private lands that add to the core network of the natural landscape.

Current wild edible gathering opportunities on the Refuge are in the area south of Ditch 11 with daily quantity limits of 5 gallons of poke, 1 gallon of mushrooms and 1 gallon of berries. This document and the corresponding Compatibility Determination propose to expand the area where gathering of wild edibles is allowed on the Refuge and to increase the quantity of edibles that may be gathered for personal use.

Established in 1944 under authority of the Migratory Bird Treaty Act, the 21,592-acre Mingo NWR is located in Stoddard and Wayne counties in southeast Missouri. A shallow basin, the Refuge lies in an abandoned channel of the Mississippi River bordered on the west by the Ozark Plateau and on the east by Crowley's Ridge. The Refuge contains approximately 16,000 acres of bottomland and upland hardwood forest, 3,000 acres of marsh and water, 1,800 acres of cropland and moist soil units, and 170 acres of grassy openings. It is located approximately 150 miles south of St. Louis and 170 miles north of Memphis, TN (Figure 1).

The National Wildlife Refuge System Improvement Act specifically required that people be provided the opportunity to enjoy, understand and be part of wildlife conservation on refuges. The National Wildlife Refuge System Improvement Act states that compatible, wildlife-dependent recreational uses involving hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation are priority public uses of the Refuge System. The Service determines whether these uses are compatible for each individual refuge. A use is determined to be compatible if it does not interfere with the fulfillment of the mission of the Refuge System or the purpose of the individual refuge.

The Service's Regional Director will select one of the alternatives analyzed in detail and will determine, based on the facts and recommendations contained herein, whether this Environmental Assessment (EA) is adequate to support a Finding of No Significant Impact (FONSI) or whether an Environmental Impact Statement (EIS) will be required.

The Mingo National Wildlife Refuge Environmental Assessment and Comprehensive Conservation Plan (CCP) determined that gathering of wild edibles would be allowed on the Refuge. Therefore, a no gathering (not to be confused with No Action) alternative will not be considered in this EA.

1.6 Decision to be made

This EA includes an evaluation of the environmental effects of the action alternatives and provide information to help the Service fully consider environmental impacts. Using the analysis in this EA, the Service will decide whether there would be any significant effects associated with the alternatives that would require the preparation of an environmental impact statement or whether the Proposed Action should be adopted.

1.7 Regulatory Compliance

This EA was prepared by the Service and represents compliance with applicable Federal statutes, regulations, Executive Orders, and other compliance documents, including the following:

- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996).
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470).
- Clean Air Act of 1972, as amended (42 U.S.C. 7401 *et seq.*).
- Clean Water Act of 1972, as amended (33 U.S.C. 1251 *et seq.*).
- Endangered Species Act of 1973, (ESA) as amended (16 U.S.C. 1531 *et seq.*).
- Executive Order 12898, Federal Action Alternatives to Address Environmental Justice in Minority Populations and Low Income Populations, 1994.
- Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661 *et seq.*).
- National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*).
- Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500 *et seq.*).
- National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 *et seq.*).

- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 *et seq.*).
- Protection and Enhancement of the Cultural Environment (Executive Order 11593).

Further, this EA reflects compliance with applicable State of Missouri and local regulations, statutes, policies, and standards for conserving the environment and environmental resources such as water and air quality, endangered plants and animals, and cultural resources.

1.8 Scoping and Public Participation

The Refuge has received comments from the public asking for an expansion of gathering of wild edibles in both area and quantity. Many people conducting other activities on the refuge such as hunting, hiking or birdwatching would like the ability to gather wild edibles.

Additional comments will be taken during a listening session to be held for all updated Refuge compatibility determinations.

2.0 Proposed Action and Alternatives

This section explains how alternatives were formulated and eliminated from further study, describes alternatives, and identifies the preferred alternative.

This EA evaluates the environmental consequences of gathering alternatives on the Refuge. Three alternatives are presented in this document: 1) No Action Alternative – allow areas and quantities to remain the same as currently outlined in the CCP; 2) Continue gathering in the area from Alternative 1 plus open an additional area of the Refuge west of Ditch 6 and increase the quantity allowed (preferred alternative); 3) Continue gathering in the area from Alternative 1 plus open an additional area north and west of the Ozark Highland Auto Tour with the additional quantities proposed in Alternative 2.

Factors considered in the development of alternatives were:

1. Compatibility with the purpose of the Refuge and the mission of the National Wildlife Refuge System.
2. Natural resources of the Refuge.
3. Demands and expectations of public use, with concerns for safety.
4. Issues identified in the Draft Environment Assessment and Comprehensive Conservation Plan and comments from partners.
5. Requirements and guidance provided in establishment legislation, specifically the Migratory Bird Conservation Act and the Emergency Wetland Resources Act of 1986.

2.1 Alternatives Eliminated from Detailed Study

2.1.1 No Gathering of Wild Edibles

An alternative that would have closed the Refuge to all gathering of wild edibles was not considered for detailed analysis because:

- The Comprehensive Conservation Plan identified gathering of wild edibles as a future use after a Draft Environmental Assessment determined a Finding of No Significant Impact (FONSI).
- Gathering of wild edibles is a tradition in Wayne and Stoddard Counties.

2.1.2 Open the Entire Refuge to Gathering

An alternative would have opened the entire refuge to all gathering of wild edibles was not considered for detailed analysis because:

- Conflicts between Refuge users may have increased to unacceptable levels.
- Public safety concerns from gatherers picking in areas open to hunting.
- Impacts to wildlife resources from over use of some areas and wildlife disturbance considerations.

2.2. Description of Alternatives

2.2.1 Alternative 1- No Action – Allow areas and quantities to be gathered using existing regulations and locations.

This action would utilize the parameters of wild edible gathering established by current regulations. Quantity gathered would be those allowed by the current regulations and in areas currently open to gathering (Figure 2).

2.2.2 Alternative 2 – Preferred Alternative- Expand area to west of Ditch 6 and increase quantity for gathering of wild edibles.

Under this alternative, the gathering area would expand by including an area west of Ditch 6 to the Refuge boundary (Figure 3). The daily quantity of wild edibles would be increased to 2 gallons of mushrooms and 2 gallons of berries per person. The daily quantity of poke would remain at 5 gallons per person. Gathering of wild edibles would continue to be for personal use only.

2.2.3 Alternative 3 - Expand area to west/north of the Ozark Highland Auto tour and increase quantity for gathering of wild edibles.

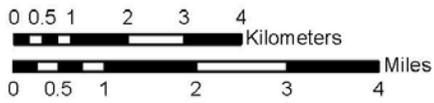
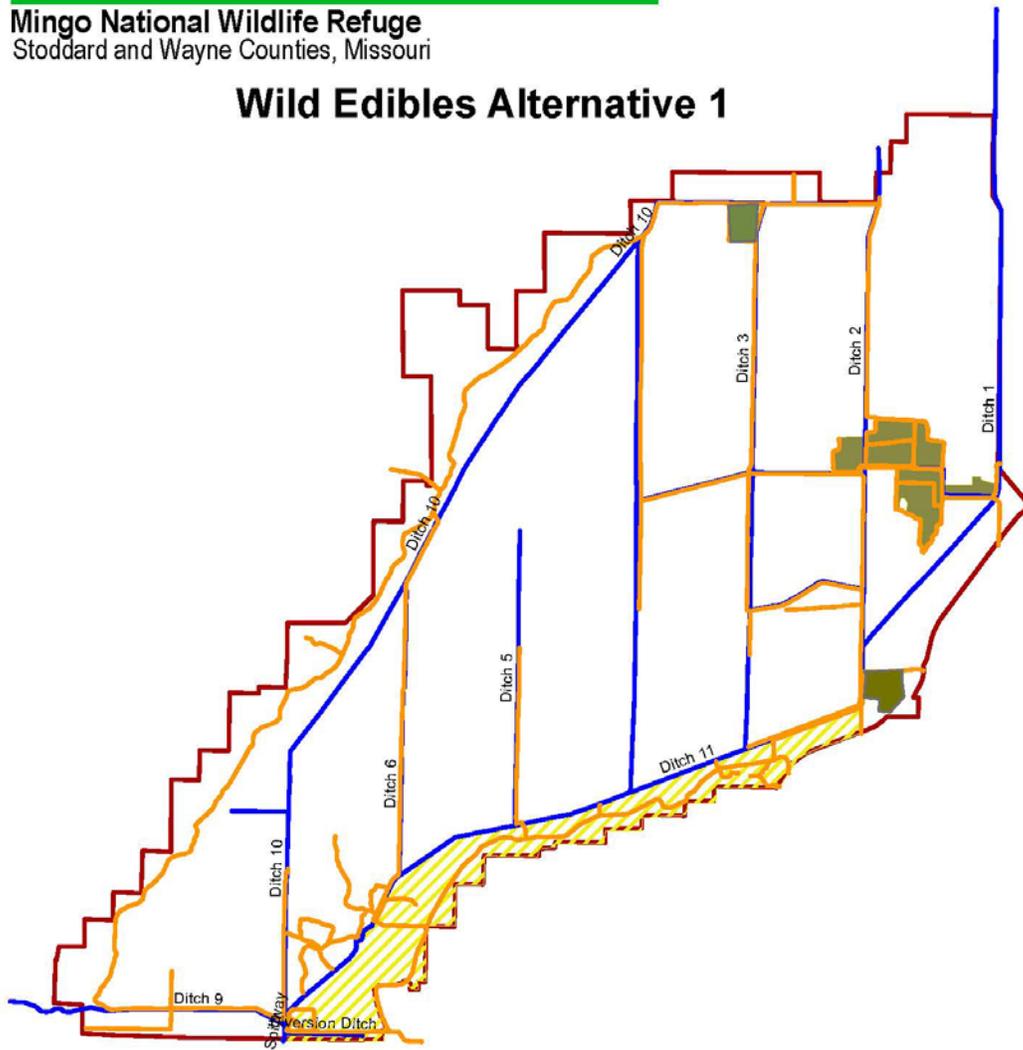
Under this alternative, the gathering area would expand by including an area west and north of the Ozark Highland Auto tour ending at Ditch 4 to the Refuge boundary (Figure 4). The daily quantity of wild edibles would be increased to 2 gallons of mushrooms and 2 gallons of berries per person. The daily quantity of poke would remain at 5 gallons per person. Gathering of wild edibles would continue to be for personal use only.



U.S. Fish & Wildlife Service

Mingo National Wildlife Refuge
Stoddard and Wayne Counties, Missouri

Wild Edibles Alternative 1



Alternative

- Mingo Roads
- Alternative 1
- Ditches

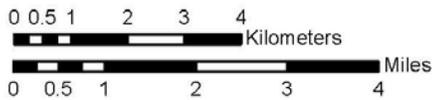
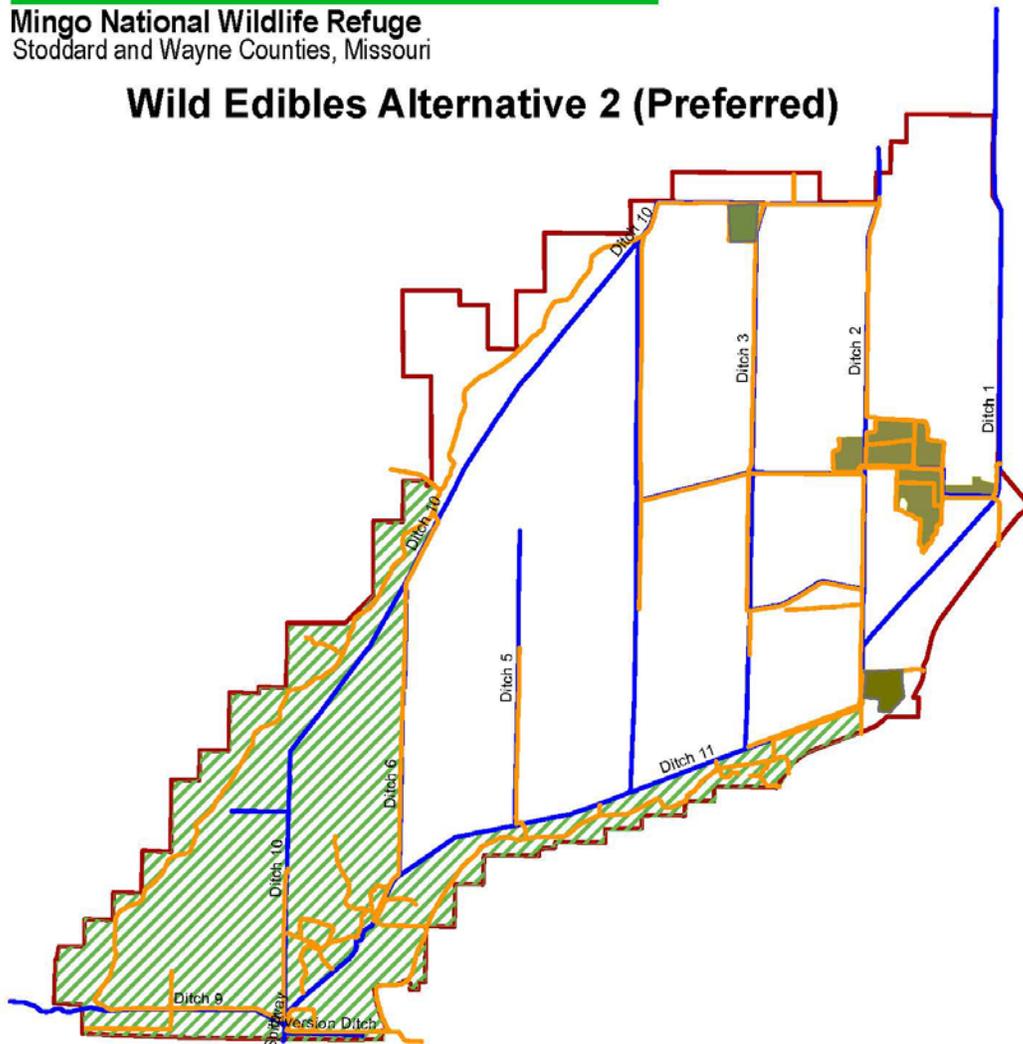
Figure 2. Wild Edibles Area for Alternative 1.



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Mingo National Wildlife Refuge
Stoddard and Wayne Counties, Missouri

Wild Edibles Alternative 2 (Preferred)



Alternative

- Mingo Roads
- Alternative 2
- Ditches

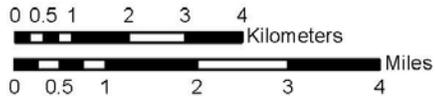
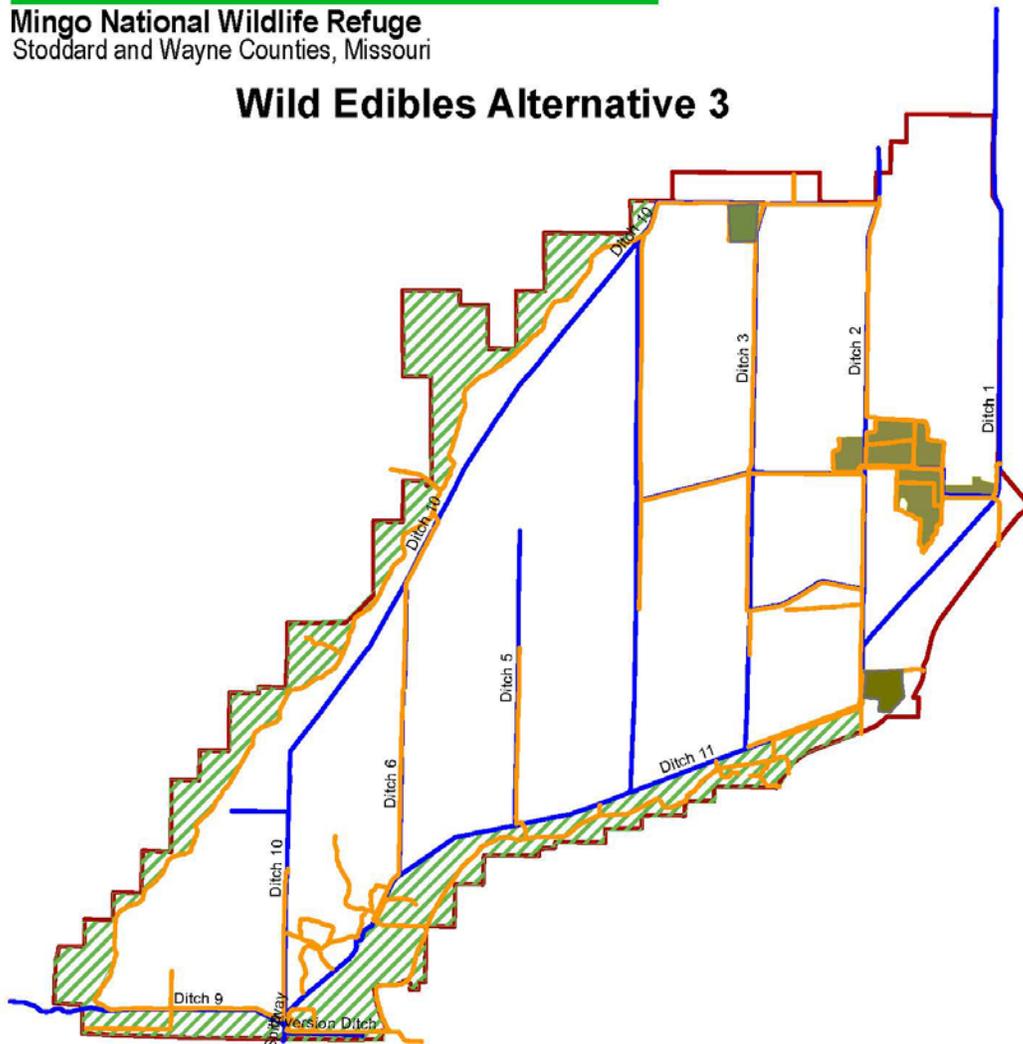
Figure 3. Wild Edibles Area for Alternative 2.



U.S. Fish & Wildlife Service

Mingo National Wildlife Refuge
Stoddard and Wayne Counties, Missouri

Wild Edibles Alternative 3



Alternative

- Mingo Roads
- Alternative 3
- Ditches



Figure 4. Wild Edibles Area for Alternative 3.

2.3 Comparison of Alternatives

The table below summarizes actions that are anticipated under each alternative. Some of the issues are carried into the impact assessment and described in more detail in Section 4.

Table 1: Table of alternatives analyzed in the EA.

Action	Alternative 1 (No Action)	Alternative 2 (Preferred)	Alternative 3
Gathering of Wild Edibles	Gathering allowed south of Ditch 11. Daily quantities allowed 1 gallon of mushrooms and berries and 5 gallons of poke.	Gathering allowed south of Ditch 11 and west of Ditch 6 to the refuge boundary. Daily quantities allowed 2 gallon of mushrooms and berries and 5 gallons of poke.	Gathering allowed south of Ditch 11 and west/north of the Ozark highland Auto tour ending at Ditch 4 to the refuge boundary. Daily quantities allowed 2 gallon of mushrooms and berries and 5 gallons of poke.

3.0 Affected Environment

3.1 Physical Characteristics

Mingo National Wildlife Refuge lies at the northern tip of the Lower Mississippi River Ecosystem where it meets the Ozark Plateau Ecosystem. The forested wetlands found across the Mingo basin are characteristic of the Lower Mississippi River Ecosystem, while the upland forests found along the bluffs are characteristic of the Ozark Plateau Ecosystem.

The Lower Mississippi River Ecosystem was a 25-million-acre complex of forested wetlands that extended along both sides of the Mississippi River from Illinois to Louisiana. The extent and duration of seasonal flooding from the Mississippi River fluctuated annually, recharging aquatic systems and creating a diversity of dynamic habitats that supported a vast array of fish and wildlife. Today less than 20 percent of the bottomland hardwood forest remains and most is fragmented or in scattered patches throughout the region.

3.2 Natural Resources

3.2.1 Habitat

Established in 1944 under authority of the Migratory Bird Treaty Act, the 21,592-acre Mingo NWR is located in Stoddard and Wayne counties in southeast Missouri. A shallow basin, the Refuge lies in an abandoned channel of the Mississippi River bordered on the west by the Ozark Plateau and on the east by Crowley's Ridge. The Refuge contains approximately 16,000 acres of bottomland and upland hardwood forest, 3,000 acres of marsh and water, 1,800 acres of cropland and moist soil units, and 170 acres of grassy openings.

Mingo NWR comprises many different habitat types. Due to the layout of the refuge, management units are separated into geographic blocks or by habitat management types to provide clear management objectives for each unit on the refuge. The refuge is divided into 8 management unit types with sub-units in most units (Table 2). Each unit represents a specific habitat type and most occur across refuge lands. This diversity and juxtaposition of habitat types serve to enhance biodiversity on the refuge, and each management unit provides a unique set of resources that are necessary for target wildlife to complete their respective life cycles. The Mingo Wilderness area overlaps many of the habitat units and will be addressed in each appropriate unit.

Table 2: Management Units at Mingo NWR

Unit Name	Acres
Monopoly Marsh	2008
Rockhouse Marsh	903
Green Tree Reservoirs (GTRs)	6308
Bottomland Hardwood Units (BLH)	8861
Upland Forest	1315
Moist Soil Units	800
Openings, Croplands, Food Plots	804
Open Water	387 acres of open water including 77 miles of streams, rivers, and ditches.

3.2.2 Fish and Wildlife of the Refuge

A total of 279 resident and migratory bird species use Refuge habitats throughout each year. Tens of thousands of mallards (*Anas platyrhynchos*), Canada geese (*Branta canadensis*), and other migrating waterfowl use Refuge wetlands as stopover or wintering habitat. Hooded mergansers (*Lophodytes cucullatus*) and wooducks (*Aix sponsa*) are resident breeders on the Refuge. Monopoly Marsh draws wood ducks from a five-state area during molting season. Bald eagles (*Haliaeetus leucocephalus*), least bitterns (*Ixobrychus exilis*), and mourning doves (*Zenaida macroura*) are among the 108 bird species that regularly breed on the Refuge.

Thirty-eight mammal species are found within the Refuge. White-tailed deer, a species popular for hunting and viewing, are abundant at a population density of over 50 per square mile. There is a wide diversity of small mammals including three species of squirrels, two species of bats, and various mice, rats, and voles. The Refuge is one of the few places in Missouri where the swamp rabbit (*Sylvilagus aquaticus*), a larger relative of the eastern cottontail rabbit (*Sylvilagus*

floridanus), is known to occur. Unlike other rabbits, the swamp rabbit regularly takes to the water to move about and avoid predators.

Amphibians and reptiles are abundant on the Refuge with more than 30 species of frogs, toads, salamanders, and snakes including the venomous western cottonmouth (*Agkistrodon piscivorus*), southern copperhead (*Agkistrodon contortrix*), and timber rattlesnake (*Crotalus horridus*). Many of these species hibernate within the cracks and crevices of the bluffs along the perimeter of the Refuge.

At least 46 species of fish, including channel catfish (*Ictalurus punctatus*), white crappie (*Pomoxis annularis*), spotted bass (*Micropterus punctulatus*), and green sunfish (*Lepomis cyanellus*), are known to occur in the ponds and ditches of the Refuge.

3.2.3 Federally Threatened and Endangered Species

Special status species found within the project area that are listed as being either threatened (T), endangered (E) or as candidates (C) for being listed include: Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*).

3.3 Historical and Cultural Resources

The Refuge has completed archeological surveys for almost 7,200 acres on the Refuge, including the Mingo Job Corps campus prior to its transfer to the U.S. Forest Service. The surveys and other sources have identified more than 140 cultural resources sites on the refuge. Recorded archeological sites on the Refuge represent all Midwest United States cultural periods from the earliest Paleo-Indian through 20th century Western, a period of about 12,000 years. Nevertheless, evidence shows no human presence in the Refuge and vicinity at the time Europeans first entered the region. One standing structure on the Refuge, the Patrol or Sweet's Cabin from the early 20th century, is representative of Depression era homesteads in the region; it is historically significant and may be eligible for the National Register. As of September 2003, Stoddard and Wayne counties listed seven properties on the National Register of Historic Places, probably not indicative of the kinds of historic places that exist in the two counties. The Refuge contains one of the National Register properties, the Mingo National Wildlife Refuge Archeology District.

The North American Consultation Database run by the National Park Service to assist Federal agencies responding to the requirements of the Native American Graves and Protection and Repatriation Act lists no tribes with identified interests in Stoddard and Wayne counties. The database, however, is not a comprehensive list, being based on a limited number of legal sources. Cherokee, Choctaw, Creek, Delaware, Miami, Mingo (Iroquois), Osage, Quapaw, Seneca, and Shawnee may have had limited historic period interest in the refuge area, the Chickasaw and Tunica may have had protohistoric period interest, and the antecedent Pawnee and Wichita may have had prehistoric interest. Other interest groups that might have a cultural resources concern about the refuge have not yet been identified.

Cultural resources are important parts of the nation's heritage. The Service preserves valuable evidence of human interactions with each other and the landscape. Protection is accomplished in conjunction with the Service's mandate to protect fish, wildlife, and plant resources.

3.4 Economic Resources

The Refuge is tied to the local economy largely through the public's use of the Refuge for recreational opportunities. These opportunities typically come in the form of fishing, hunting, wildlife viewing and sightseeing.

3.5 Recreational Opportunities

In general, as described in the Comprehensive Conservation Plan and Visitor Services Plan, public uses to be considered include: a combination of hiking and auto interpretive trails, wildlife viewing and photography areas, environmental education stations, visitor center with exhibits, and special seasonal wildlife programs.

Gathering opportunities proposed on the Mingo NWR already exist on state, federal and other public lands in Wayne and Stoddard Counties. Currently Butler, Bollinger, Wayne and Stoddard Counties have nearly 244,157 acres of MDC Conservation Areas, National Forest and Army Corp of Engineer lands open for some level of wild edible gathering.

4.0 Environmental Consequences

This chapter describes the foreseeable environmental consequences of implementing the three management alternatives in Chapter 2. When detailed information is available, a scientific and analytic comparison between alternatives and their anticipated consequences is presented, which is described as "impacts" or "effects." When detailed information is not available, those comparisons are based on the professional judgment and experience of Refuge staff and Service and State biologists.

4.1 Alternative 1- No Action – Allow gathering of wild edibles using current regulations

This action would utilize the parameters of gathering established by current regulations. Species and quantities gathered will be those allowed by the current regulations and in areas currently open to gathering (Figure 2).

4.1.1 Infrastructure

Providing gathering opportunities under this alternative will not adversely affect, temporarily or permanently, the Service's ability to meet land use goals on any area open to gathering. Any additional refuge facility development, such as trailheads or parking lots, will not be for the sole use of gatherers and would be developed under all alternatives. Parking areas and trailheads will be used by all users of the Refuge, including staff conducting day-to-day operations critical to the mission of the Refuge. There will be a change in wildlife habitat if/where parking lots and

trails are developed as those areas are converted to gravel or bare soil but wildlife may still use these areas.

4.1.2 Natural Resources

4.1.2.1 Habitats

The selection of this alternative would not have significant adverse effects on the quality of wildlife habitat or the natural environment. In this alternative, the amount of habitat by type would not change from the current situation. With any alternative, some minor trampling of vegetation from gatherers using areas other than established trails is expected. Access throughout Refuge units for gathering is typically by foot.

Impacts to Refuge soils and vegetation by gatherers are minimal. Gathering is conducted on foot mostly by individuals or small groups. Typically gatherers travel in dispersed patterns so soil compaction and vegetation trampling will be minimal.

Other potential types of habitat damage specifically attributed to gathering activities, such as littering, are not significant. Refuge specific regulations limit the adverse impact of activities such as cutting of vegetation through prohibition.

4.1.2.2 Biological Impacts

This alternative will result in few, if any additional biological impacts. Gathering will continue as it has under the CCP.

4.1.2.3 Listed Species

No effect is expected for any of the threatened and endangered species found within the Refuge as a result of this alternative.

4.1.2.4 Historic Properties and Cultural Resources

This alternative will result in no additional ground disturbance or disturbance to standing structures, and it would have no effect on any historic properties. Activities that might cause an effect to a historic property would be subject to a case by case Section 106 review.

4.1.3 Cumulative Impact Analysis of the No Action Alternative

4.1.3.1 Anticipated Direct and Indirect Impact on Wildlife Species

This alternative would not have additional effect on wildlife populations. Gathering would continue at the current limitations and in existing areas. Gathering of wild edibles by the public is currently minimal in both duration and number of participants. Many of the gatherers using the refuge target morel mushrooms (*Morchella sp.*) for a 1 month period in the spring. Gathering

of wild edibles can remove a food source for some species of wildlife but is not expected to have a notable impact on wildlife or edibles removed (Barron and Emery 2009).

4.1.3.2 Anticipated Direct and Indirect Impact on Refuge Programs, Facilities, and Cultural Resources Other Refuge Wildlife-Dependent Recreation

Other Refuge Wildlife-Dependent Recreation: Each year thousands of people visit Mingo NWR (124,617 visits in 2015) to enjoy the resources. Wildlife observation visits, particularly bird watching, account for the highest wildlife-dependent recreational use recorded for the Refuge.

Under this alternative, the public gathering of wild edibles opportunity would remain the same. Gathering of wild edibles is also a way for the public to gain an increased awareness of Mingo NWR and the National Wildlife Refuge System.

Refuge Facilities. No additional impacts to Refuge facilities (roads, parking lots, trails) will occur with this alternative. Under this alternative, Refuge facilities would continue as they are now. Maintenance or improvement of existing roads and parking areas will cause minimal short term impacts to localized soils and may cause some temporary wildlife disturbance.

Cultural Resources. This alternative will not have any additional impacts to cultural resources. Activities that might cause an effect to a historic property would be subject to a case by case Section 106 review.

4.1.3.3 Anticipated Direct and Indirect Impact on Refuge Environment and Community

The No Action alternative will have little if any additional impact on soils, air quality, water quality or solitude.

This alternative may have impacts on gathering opportunities in the local area. Under this alternative additional gatherers would not be able to utilize the Refuge and fewer people will use facilities both on and off of the Refuge. This alternative would also not increase public gathering opportunity and may lead to increased usage of surrounding private and public lands.

4.1.3.4 Other Past, Present, Proposed, and Reasonably Foreseeable Gathering Opportunities and Anticipated Impacts.

This alternative would have no additional anticipated impacts from gathering. No additional gathering opportunities are planned or expected at this time on the Refuge.

4.1.3.5 Anticipated Impacts If Individual Gathering Opportunities Are Allowed To Accumulate

National Wildlife Refuges, including Mingo NWR, conduct or will conduct gathering programs within the framework of State and Federal regulations.

Refuge personnel expect and witness that most gatherers respect spacing needs and will essentially regulate themselves. User conflicts might occur between non-consumptive users and gatherers. This is not expected since the process of gathering wild edibles is not intrusive and doesn't limit non-consumptive users in the area.

4.1.4 Environmental Justice

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" was signed by President Bill Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities' access to public information and participation in matters relating to human health or the environment. This assessment has not identified any adverse or beneficial effects for either alternative unique to minority or low-income populations in the affected area. Neither alternative will disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low income populations.

Gathering opportunities proposed on Mingo NWR already exist on state, federal and other public lands in the area where the Refuge is located. The effects of gathering on Refuges have been examined in several environmental review documents, including the Final Environmental Impact Statement on the Operation of the National Wildlife Refuge System (1976), Recommendations on the Management of the National Wildlife Refuge System (1978), and the Draft Environmental Impact Statement on the Management of the National Wildlife Refuges (1988). Nothing in the establishing authority for Mingo National Wildlife Refuge [Fish and Wildlife Act of 1956{16U.S.C. 742f}] precludes gathering on the Refuge.

4.2 Alternative 2 – Preferred Alternative- Expand area to west of Ditch 6 and increase quantity for gathering of wild edibles.

Under this alternative, the gathering area would expand the existing gathering area by including an area west of Ditch 6 to the Refuge boundary (Figure 3). The daily quantity of wild edibles would be increased to 2 gallons of mushrooms and 2 gallons of berries per person. The daily quantity of poke would remain at 5 gallons per person. Gathering of wild edibles would continue to be for personal use only.

4.2.1 Infrastructure

Providing gathering opportunities under this alternative will not adversely affect, temporarily or permanently, the Services ability to meet land use goals on any of the units open to gathering. Any additional refuge facility development, such as trailheads or parking lots, will not be for the

sole use of gatherers and would be developed under either alternative. Parking areas and trailheads will be used by all users of the Refuge, including staff conducting day-to-day operations critical to the mission of the Refuge. There will be a change in wildlife habitat if/where parking lots and trails are developed as those areas are converted to gravel or bare soil but wildlife may still use these areas.

4.2.2 Natural Resources

4.2.2.1 Habitats

The selection of this alternative would not have significant adverse effects on the quality of wildlife habitat or the natural environment. In any alternative, the amount of habitat by type would not change from the current situation. With any alternative, some minor trampling of vegetation from gatherers using areas other than established trails is expected. Access throughout Refuge units for gathering is typically by foot.

Impacts to Refuge soils and vegetation by gatherers are minimal. Gathering is conducted on foot mostly by individuals or small groups. Typically gatherers travel in dispersed patterns so soil compaction and vegetation trampling will be minimal. Current regulations prevent the cutting or removal of vegetation.

Other potential types of habitat damage specifically attributed to gathering activities, such as littering, are not significant. Refuge specific regulations limit the adverse impact of activities such as cutting of vegetation and the digging of edibles.

4.2.2.2 Biological Impacts

This alternative will result in few additional biological impacts. There will be some additional impact to resident wildlife when areas that were previously not gathered or disturbed are opened due to increased foot traffic.

4.2.2.3 Listed Species

No effect is expected for any of the threatened and endangered species found within the Refuge as a result of this alternative.

4.2.2.4 Historic Properties and Cultural Resources

This alternative may include minor ground disturbing activities and no disturbance to standing structures, and it would have no effect on any historic properties. Minor ground disturbing activities may include the addition of minor impact along the edge of roads where gathers pull over in the expanded area. These areas along the road were previously disturbed during construction and impact from gatherers is not expected to impact cultural resources.

4.2.3 Cumulative Impact Analysis of the Preferred Alternative

4.2.3.1 Anticipated Direct and Indirect Impact on Wildlife Species

Additional impacts from to wildlife may be in the form of disturbance and removal of a food source (edibles) in small, isolated areas. It is expected that the increased area for gathers provided by this alternative will actually spread this impact out over a larger footprint and reduce the degree of edibles being removed in isolated areas.

4.2.3.2 Anticipated Direct and Indirect Impact on Refuge Programs, Facilities, and Cultural Resources

Other Refuge Wildlife-Dependent Recreation Each year thousands of people visit Mingo NWR (136,825 visits in 2009) to enjoy the resources. Wildlife observation visits, particularly bird watching, account for the highest wildlife-dependent recreational use recorded for the Refuge.

Under this alternative, the gathering of wild edibles opportunity would increase while not impacting other recreational activities significantly. Gathering is also a way for the public to gain an increased awareness of Mingo NWR and the National Wildlife Refuge System.

Refuge Facilities No additional impacts to Refuge facilities (roads, parking lots, trails) will occur with this alternative. Under this alternative, Refuge facilities would continue as they are now. Maintenance or improvement of existing roads and parking areas will cause minimal short term impacts to localized soils and may cause some temporary wildlife disturbance.

Cultural Resources. This alternative will have minimal additional impacts to cultural resources.

4.2.3.3 Anticipated Direct and Indirect Impact on Refuge Environment and Community

Alternative 2 will have little if any additional impact on soils, air quality, water quality or solitude. Vegetation, as stated above, could be affected by spreading the area gatherers have available to them.

This alternative may have impacts on gathering in the local area. Under this alternative, additional gatherers would be able to utilize the Refuge and more people will use facilities both on and off of the Refuge. This alternative would also increase public gathering opportunity and may lead to decreased usage of surrounding private and public lands.

As a result of this alternative, expenditures by visitors for meals, lodging and transportation would increase in the communities. Municipalities and community organizations could bring additional tourism revenues into their economies by establishing partnerships with the Service to develop and promote the recreational opportunities that are available on the Refuge lands in their communities.

Impacts to the natural hydrology would be negligible. The Refuge staff expects impacts to air and water quality to be minimal and only due to Refuge visitor's use of automobiles on adjacent township and county public roads. The effect of these Refuge-related activities on overall air and water quality in the region are anticipated to be negligible.

Existing State water quality criteria and use classifications are adequate to achieve desired on-Refuge conditions; thus, implementation of the proposed action would not impact adjacent landowners or users beyond the constraints already implemented under existing State standards and laws.

Impacts associated with solitude are expected to be minimal given the limited time, season, and space management techniques used to avoid conflicts among user groups.

Some additional conflicts might be expected as part of this alternative as more people would be in the expanded gathering area along the Ozark highland Auto Tour.

4.2.3.4 Other Past, Present, Proposed, and Reasonably Foreseeable Gathering Opportunities and Anticipated Impacts

This alternative would have no additional anticipated impacts from gathering. No additional gathering opportunities are planned or expected at this time on the Refuge.

4.2.3.5 Anticipated Impacts If Individual Gathering Opportunities Are Allowed To Accumulate

National Wildlife Refuges, including Mingo NWR, conduct or will conduct gathering programs within the framework of State and Federal regulations.

Refuge personnel expect and witness that most gatherers respect spacing needs and will essentially regulate themselves. User conflicts might occur between non-consumptive users and gatherers. This is not expected since the process of gathering wild edibles is not intrusive and doesn't limit non-consumptive users in the area.

4.2.4 Environmental Justice

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" was signed by President Bill Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities' access to public information and participation in matters relating to human health or the environment. This assessment has not identified any adverse or beneficial effects for either alternative unique to minority or low-income populations in the affected area. Neither alternative will disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low income populations.

Gathering opportunities proposed on Mingo NWR already exist on state, federal and other public lands in the area where the Refuge is located. The effects of gathering on Refuges have been examined in several environmental review documents, including the Final Environmental Impact Statement on the Operation of the National Wildlife Refuge System (1976), Recommendations on the Management of the National Wildlife Refuge System (1978), and the Draft Environmental Impact Statement on the Management of the National Wildlife Refuges (1988). Nothing in the establishing authority for Mingo National Wildlife Refuge [Fish and Wildlife Act of 1956{16U.S.C. 742f}] precludes gathering on the Refuge.

4.3 Alternative 3 - Expand area to west/north of the Ozark Highland Auto tour and increase quantity for gathering of wild edibles.

Under this alternative, the gathering area would expand the existing gathering area by including an area west and north of the Ozark Highland Auto tour ending at Ditch 4 to the Refuge boundary (Figure 4). The daily quantity of wild edibles would be increased to 2 gallons of mushrooms and 2 gallons of berries per person. The daily quantity of poke would remain at 5 gallons per person. Gathering of wild edibles would continue to be for personal use only.

4.3.1 Infrastructure

Providing gathering opportunities under this alternative will not adversely affect, temporarily or permanently, the Services ability to meet land use goals on any of the units open to gathering. Any additional refuge facility development, such as trailheads or parking lots, will not be for the sole use of gatherers and would be developed under either alternative. Parking areas and trailheads will be used by all users of the Refuge, including staff conducting day-to-day operations critical to the mission of the Refuge. There will be a change in wildlife habitat if/where parking lots and trails are developed as those areas are converted to gravel or bare soil but wildlife may still use these areas.

4.3.2 Natural Resources

4.3.2.1 Habitats

The selection of this alternative would not have significant adverse effects on the quality of wildlife habitat or the natural environment. In any alternative, the amount of habitat by type would not change from the current situation. With any alternative, some minor trampling of vegetation from gatherers using areas other than established trails is expected. Access throughout Refuge units for gathering is typically by foot.

Impacts to Refuge soils and vegetation by gatherers are minimal. Gathering is conducted on foot mostly by individuals or small groups. Typically gatherers travel in dispersed patterns so soil compaction and vegetation trampling will be minimal. Current regulations prevent the cutting or removal of vegetation.

Other potential types of habitat damage specifically attributed to gathering activities, such as littering, are not significant. Refuge specific regulations limit the adverse impact of activities such as cutting of vegetation and the digging of edibles.

4.3.2.2 Biological Impacts

This alternative will result in few additional biological impacts. There will be some additional impact to resident wildlife when areas that were previously not gathered or disturbed are opened due to increased foot traffic.

4.3.2.3 Listed Species

No effect is expected for any of the threatened and endangered species found within the Refuge as a result of this alternative.

4.3.2.4 Historic Properties and Cultural Resources

This alternative may include minor ground disturbing activities and no disturbance to standing structures, and it would have no effect on any historic properties. Minor ground disturbing activities may include the addition of minor impact along the edge of roads where gathers pull over in the expanded area. These areas along the road were previously disturbed during construction and impact from gatherers is not expected to impact cultural resources.

4.3.3 Cumulative Impact Analysis of Alternative 3.

4.3.3.1 Anticipated Direct and Indirect Impact on Wildlife Species

Additional impacts from to wildlife may be in the form of disturbance and removal of a food source (edibles) in small, isolated areas. It is expected that the increased area for gathers provided by this alternative will actually spread this impact out over a larger footprint and reduce the degree of edibles being removed in isolated areas.

4.3.3.2 Anticipated Direct and Indirect Impact on Refuge Programs, Facilities, and Cultural Resources Other Refuge Wildlife-Dependent Recreation

Other Refuge Wildlife-Dependent Recreation: Each year thousands of people visit Mingo NWR (136,825 visits in 2009) to enjoy the resources. Wildlife observation visits, particularly bird watching, account for the highest wildlife-dependent recreational use recorded for the Refuge.

Under this alternative, the gathering of wild edibles opportunity would increase while not impacting other recreational activities significantly. Gathering is also a way for the public to gain an increased awareness of Mingo NWR and the National Wildlife Refuge System.

Refuge Facilities. No additional impacts to Refuge facilities (roads, parking lots, trails) will occur with this alternative. Under this alternative, Refuge facilities would continue as they are now. Maintenance or improvement of existing roads and parking areas will cause minimal short term impacts to localized soils and may cause some temporary wildlife disturbance.

Cultural Resources. This alternative will have minimal additional impacts to cultural resources.

4.3.3.3 Anticipated Direct and Indirect Impact on Refuge Environment and Community

Alternative 3 will have little if any additional impact on soils, air quality, water quality or solitude. Vegetation, as stated above, could be affected by spreading the area gatherers have available to them.

This alternative may have impacts on gathering in the local area. Under this alternative, additional gatherers would be able to utilize the Refuge and more people will use facilities both on and off of the Refuge. This alternative would also increase public gathering opportunity and may lead to decreased usage of surrounding private and public lands.

As a result of this alternative, expenditures by visitors for meals, lodging and transportation would increase in the communities. Municipalities and community organizations could bring additional tourism revenues into their economies by establishing partnerships with the Service to develop and promote the recreational opportunities that are available on the Refuge lands in their communities.

Impacts to the natural hydrology would be negligible. The Refuge staff expects impacts to air and water quality to be minimal and only due to Refuge visitor's use of automobiles on adjacent township and county public roads. The effect of these Refuge-related activities on overall air and water quality in the region are anticipated to be negligible.

Existing State water quality criteria and use classifications are adequate to achieve desired on-Refuge conditions; thus, implementation of the proposed action would not impact adjacent landowners or users beyond the constraints already implemented under existing State standards and laws.

Impacts associated with solitude are expected to be minimal given the limited time, season, and space management techniques used to avoid conflicts among user groups.

Some additional conflicts might be expected as part of this alternative as more people would be in the expanded gathering area along the Ozark highland Auto Tour.

4.3.3.4 Other Past, Present, Proposed, and Reasonably Foreseeable Gathering Opportunities and Anticipated Impacts

This alternative would have no additional anticipated impacts from gathering. No additional gathering opportunities are planned or expected at this time on the Refuge.

4.3.3.5 Anticipated Impacts If Individual Gathering Opportunities Are Allowed To Accumulate

National Wildlife Refuges, including Mingo NWR, conduct or will conduct gathering programs within the framework of State and Federal regulations.

Refuge personnel expect and witness that most gatherers respect spacing needs and will essentially regulate themselves. User conflicts might occur between non-consumptive users and gatherers. This is not expected since the process of gathering wild edibles is not intrusive and doesn't limit the ability of non-consumptive users in the area.

4.3.4 Environmental Justice

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" was signed by President Bill Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities' access to public information and participation in matters relating to human health or the environment. This assessment has not identified any adverse or beneficial effects for either alternative unique to minority or low-income populations in the affected area. Neither alternative will disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low income populations.

Gathering opportunities proposed on Mingo NWR already exist on state, federal and other public lands in the area where the Refuge is located. The effects of gathering on Refuges have been examined in several environmental review documents, including the Final Environmental Impact Statement on the Operation of the National Wildlife Refuge System (1976), Recommendations on the Management of the National Wildlife Refuge System (1978), and the Draft Environmental Impact Statement on the Management of the National Wildlife Refuges (1988). Nothing in the establishing authority for Mingo National Wildlife Refuge [Fish and Wildlife Act of 1956{16U.S.C. 742f}] precludes gathering on the Refuge.

4.4 Comparison of Environmental Impacts by Alternative

Table 6. Environmental impacts for each alternative.

RESOURCE	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2 (Preferred)	ALTERNATIVE 3
Wildlife	No additional impact to wildlife	Minimal impact to wildlife through dispersing of gatherers into a larger area. Some disturbance to wildlife during gathering.	Minimal impact to wildlife through dispersing of gatherers into a larger area. Some disturbance to wildlife during gathering.
Other Concerns - Habitats	No change expected	No impact	No impact
Threatened and Endangered Species	No impact	No impact	No impact
Historic and Cultural Resources	No impact	No impact	No impact

5.0 Environmental Justice

No one group or Tribe represented in the community would be disproportionately impacted by building the administrative facility on the parcel. Thus, Alternatives 1, 2 and 3 would not result in any environmental justice issues.

6.0 List of Preparers

Ben Mense, Refuge Manager, Mingo National Wildlife Refuge
 Brad Pendley, Wildlife Biologist, Mingo National Wildlife Refuge

For issues identification and public use ideas:

Public comments from public listening session.

Federal and state listed threatened and endangered species:

<http://www.fws.gov/midwest/endangered/lists/missouri-cty.html>

<http://mdc.mo.gov/discover-nature/field-guide/endangered-species/endangered-species-field-guide>

Draft document reviewed by:

U.S. Fish and Wildlife Service, Bloomington, MN

7.0 References

- Barron, E.S. and M.R. Emery. 2009. Protecting Resources: Assessing harvesting of wild morel mushrooms in two National Capital Region parks. Natural Resource Technical Report NPS/NCRO/NRTR—2009/002. Department of the Interior, National Park Service, Washington, D.C
- L. Liegel, D. Pilz, T. Love and E. Jones. 1998. Ambio, Special Report Number 9. The Biological, Socioeconomic, and Managerial Aspects of Chanterelle Mushroom Harvesting: The Olympic Peninsula, Washington State,U.S.A. pp. 26-33
- U.S. Dept. of Agriculture. 1996. Managing Forest Ecosystems to Conserve Fungus Diversity and Sustain Wild Mushroom Harvests. D. Pilt and R. Molina, ed. Pg 115.
- U.S. Fish and Wildlife Service Endangered and Threatened Species List - Missouri http://www.fws.gov/midwest/endangered/lists/cty_indx.html#missouri
- U.S. Fish and Wildlife Service. 2007 Environmental Assessment and Comprehensive Conservation Plan for Mingo National Wildlife Refuge, Missouri.
- U.S. Fish and Wildlife Service. 2011. Conserving the Future, Wildlife Refuges and the Next Generation. The National Wildlife Refuge System. Department of the Interior, Washington, D.C.
- U.S. Fish and Wildlife Service. 2015. Mingo Annual Narrative for Mingo National Wildlife Refuge. Unpublished Document.

8.0 Response to Comments on the Environmental Assessment and Compatibility Determination

The Service solicited public comments for the wild edibles compatibility determination and supporting Draft Environmental Assessment.

9.0 Approvals

Submitted by:

Ben J. Mense, Project Leader

Date

Concur:

Sabrina Chandler, Refuge Supervisor Area 2

Date

Charles Blair, Regional Chief
National Wildlife Refuge System

Date

Approved:

Thomas O. Melius, Regional Director
Region 3, U.S. Fish & Wildlife Service

Date