COMPATIBILITY DETERMINATION

Use: Farming

Refuge Name: Mingo National Wildlife Refuge

Establishing and Acquisition Authority(ies): Mingo National Wildlife Refuge (NWR) was established in 1944 under the authority of the Migratory Bird Conservation Act and the Refuge Recreation Act.

Refuge Purpose(s):

"…for use as an inviolate sanctuary, or for any other management purpose for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act)

"…suitable for – (1) incidental fish and wildlife-oriented recreation development, (2) protection of natural resources, (3) the conservation of endangered species or threatened species…" 16 U.S.C. 460K-1 (Refuge Recreation Act)

An additional purpose for the refuge was identified when Congress designated the 7,730 acre Mingo Wilderness in 1976.

"…prioritizes public uses that are recreational, scientific, educational, scenic, or of conservation or historical value as primary refuge objectives permit." Public Law 88-577 (Wilderness Act)

National Wildlife Refuge System Mission: "The Mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

Description of Use: This Compatibility Determination updates and supersedes the Compatibility Determination developed concurrently with the Refuge's Comprehensive Conservation Plan (CCP) authorized in 2006. This Compatibility Determination will provide for legitimate farming needs on lands of the Mingo National Wildlife Refuge.

The Refuge will allow farming by private individuals for the purpose of habitat management. Cooperative farming is the term used for cropping activities (growing agricultural products) conducted by a third party on land that is owned by or managed as part of the U.S. Fish and Wildlife Service (Service). This activity is usually done on a short-term basis (3 years or less) to provide food for migratory waterfowl.

Cooperative farming is conducted under the terms and conditions of a Special Use Permit issued by the Refuge Manager. The terms of the Permit ensure compliance with Service policy and refuge-specific stipulations to meet management objectives and safeguard resources. In most circumstances where farming is permitted, the use agreement will require a portion of the crop be left unharvested in the field (typically 25%) for the benefit of wildlife.

Permittee selection and associated determination of percentage left un-harvested will follow all Refuge Manual guidance (5 RM 17 and 6 RM 9.11) and Region 3 farming guidance.

Farming occurs on approximately 1-2 percent of Refuge lands annually. At Mingo, farming is used as a means to provide food for migratory waterfowl, maintain open habitats, and reduce the amount of undesirable herbaceous and woody vegetation within moist soil management units. Farming may also occur if parcels containing currently farmed land are purchased as additions to the Refuge. In 2010, approximately 350 acres of agricultural fields and grassy openings were planted to trees. This decrease in acreage was specified in the Comprehensive Conservation Plan.

Farming entails the use of mechanical equipment such as tractors, disks, and seeders. Each site is tilled prior to spring planting. Tilling requires 1-2 days per site. Some sites may also be treated with herbicide prior to planting. Next, crops such as corn, milo, and soybeans are planted. Typically, planting is completed in one day or less on any individual site and planting on all sites usually begins as early as mid April and is completed as late as early July depending on soil conditions and type of crop planted. Cooperators are limited to using only Service approved herbicides. The use of genetically modified crops (GMO crops), specifically Glyphosate-tolerant corn and soybeans, will be authorized on Refuge lands consistent with current Regional policy. The use of genetically modified, Glyphosate-tolerant corn and soybeans will only be used for the purpose of habitat restoration. As of 2016, the use of neonicotinoid treated seeds is not allowed in farming programs within Region 3 of the Service.

The Refuge encourages the use of no-till farming, also known as conservation tillage. This practice is a way of growing crops from year to year without disturbing the soil through tillage. Tillage is the preparation of the soil to receive seeds, usually done with equipment such as a plow, disk, or harrow that is pulled behind a tractor. Tilling can lead to unfavorable effects like soil compaction from heavy machine traffic and erosion caused by pulverizing the soil and removing plant cover, allowing topsoil to easily blow away or run off in rainwater. In no-till farming the soil is left intact and crop residues—stalks, stubble, leaves, and seed pods left after harvesting—are left in the fields. Despite the advantages to soils, no-till farming usually requires planting herbicide-resistant crop plants and then chemically weeding with herbicides. Herbicide may be applied up to two times annually on each site. This is usually done with a tractor-drawn sprayer or self-propelled sprayer and requires up to one day per site for each application.

Traditional farming which uses tillage, and often herbicide as well, is currently practiced on all of the sites annually. This practice entails disking the site one or more times before spring planting to remove competing vegetation. This requires 1-3 days per site. Later in the growing season herbicide is applied to reduce the amount of weedy competition. This takes up to one day per site for each application. A harrow or other tractor-drawn implement may be used in place of herbicide to reduce the amount of weedy competition. This also would require about one day per site.

Harvest techniques are the same for both no-till and traditional farming practices. Harvest begins in the fall, using a self propelled harvesting implement such as a combine, and usually takes about one day per site and is complete on all sites by late October.

Availability of Resources: The needed staff time for development and administration of a cooperative farming program is available. Most of the needed work to prepare for this use would be done as part of routine management duties. The decision to use cooperative farming as a management tool would occur as part of strategies developed under specific program or unit habitat management planning. The additional time needed to coordinate issuance and oversight of the needed Special Use Permit is relatively minor and within existing Refuge resources.

The cooperative farming of Service land will, in most cases, generate income for the Service. All farming income received will be submitted for deposit in the contributed funds account and a percentage will be available at the Refuge level to offset station costs incurred in administration of this use. All Service employees involved in the administration of the program must be sensitive to the primary purpose of cooperative farming which is habitat management and providing food for migratory waterfowl. The Service should receive fair market value from cooperative farmers, but generation of income is a secondary consideration when developing the terms and conditions of a Special Use Permit for farming.

To lessen the appearance of favoritism or impropriety Refuge managers should document how cooperators were selected and how rental rates were derived.

Anticipated Impacts of the Use: On sites where farming occurs there would be periodic short-term disturbance and displacement typical of any noisy heavy equipment operation. These sites may be used by wildlife for feeding and resting at times equipment is not operating, but successful nesting is unlikely because of soil and habitat disturbance.

Soil disturbance from farming would reduce undesirable plant species in moist soil units and grassy openings allowing native species that provide dense cover and foods of high nutritive value to flourish in years the sites are not farmed. The crops left on-site as well as other crop residue would provide food for migratory waterfowl which is critical for meeting Refuge habitat management goals (Duck Energy Days) outlined in the Habitat Management Plan.

Any herbicide application would be done with products approved by the Service for such use and in compliance with label instructions. No short-term or long-term adverse impacts are expected. Farming and any associated impacts are expected to occur on 1-2 percent of Refuge lands annually.

Public Review and Comment: The period of public review and comment will be 14 days and will be announced in the local newspaper, social media, website, and other relevant media outlets. Comments will be summarized in this section after being received.

Determination:

____ Use is Not Compatible

__X__ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Cooperative farmers will typically be selected for a period of three years, however, Special Use Permits will be issued annually and will be highly regulated to minimize damage to natural resources and ensure all objectives are met.

2. Cooperative farmers will be subject to Service policy and regulation regarding use of chemicals. Herbicide and pesticide use is restricted by type and to the minimum necessary amount applied.

3. Special conditions of Special Use Permits will address unique local conditions as applicable.

4. Farming must meet specific habitat and related wildlife objectives and contribute to the purposes of the Refuge.

5. Planting and harvest activities are restricted to minimize disturbance of wildlife species.

6. The use of GMO crops is limited to Glyphosate-tolerant corn and soybeans and will only be used if in compliance with Region 3 Farming Guidelines.

7. Adhere to the Region 3 Farming Guidelines, including the prohibited use of neonicotinoid treated crop seeds.

Justification: Farming is an existing economic use that is beneficial to remove noxious weeds, invasive species, and other undesirable vegetation for habitat management, enhancement, and restoration projects. Specifically, farming is used as a habitat management tool and a means to provide food for migratory waterfowl in the following ways on Mingo NWR.

Moist Soil Units

Moist soil management is a widespread practice for producing a diverse mixture of native herbaceous plant foods and invertebrates that has its origins at Mingo National Wildlife Refuge. In addition to annual flooding, moist soil units require periodic ground disturbance to reduce the amount of undesirable vegetation. Frederickson and Taylor[1] learned from studies conducted at Mingo NWR that moist soil areas must be dried and disked to remove unwanted woody species. Cooperative farming offers a low cost means for achieving this, and approximately one third of the 700 acres under moist soil management are cropped annually. Farmers leave a portion of the crop that provides high energy food for migratory waterfowl.

Forest Openings

The Refuge is situated at the interface of the Ozark Highlands and Crowley's Ridge, encompassing portions of each along with the bottomlands between. Temporary and permanent forest openings are part of the historic vegetative condition of the Refuge. Fire, wind, and other disturbance agents likely kept about 3-5 percent (450-750 acres at Mingo NWR) of bottomland forests in temporary openings referred to as tree-gaps.[2,3,4,5] Caused by death or windthrow of one or more trees, these temporary open habitats within the forest are normally short-lived because they are quickly colonized by herbaceous plants, shrubs, and

tree seedlings. These temporary openings provide diversity within the otherwise forested matrix, and are important habitat for wildlife such as swamp rabbits and Swainson's warblers. At Mingo NWR, years of prolonged annual floods caused by poor drainage impeded colonization of tree-gaps by plants and young trees, eliminating much of this habitat. Permanent openings, largely around the perimeter of the Refuge, provide partial replacement of this lost habitat. Cooperative farming is a low cost means used to maintain about 253 acres of these openings. Farmers leave a portion of the crop that provides a supplemental food supply for resident wildlife during severe winters as well as wildlife viewing opportunities.

1Frederickson, L.H. and T.S. Scott. 1982. Management of seasonally flooded impoundments for wildlife. U.S. Fish and Wildlife Service, Resource Publication 148.

[2]Heitmeyer, M.E., R.J. Cooper, J.G. Dickson, and B.D. Leopold. 2005. Ecological relationships of warmblooded vertebrates in bottomland hardwood ecosystems. Pages 281-306 in L.H. Fredrickson, S.L. King, and R.M. Kaminski eds. Ecology and management of bottomland hardwood systems: the state of our understanding. University of Missouri-Columbia, Gaylord Memorial Laboratory Special Publication No. 10., Puxico, MO.

[3]Hartshorne, G.S. 1980. Neotropical forest dynamics. Biotrophica (Suppl.) 12:23-30

[4]Heitmeyer, M.E., L.H. Fredrickson, and G.F. Krause. 1989. Water and habitat dynamics of the Mingo Swamp in southeastern Missouri. U.S. Fish and Wildlife Service, Fish and Wildlife Research No. 6. 26pp.

[5]King, S.L. and T.J. Antrobus. 2001. Canopy disturbance patterns in a bottomland hardwood forest in northeast Arkansas. Wetlands 21:543-553.

Refuge Manager: _____

(Signature and Date)

Regional Chief Concurrence: _____

(Signature and Date)

Mandatory 10- or 15-year Re-evaluation Date: **2026**