# Draft Compatibility Determination

## Title

Draft Compatibility Determination for Commercial Forest Management to Improve Wildlife Habitat at Great Dismal Swamp National Wildlife Refuge.

## Refuge Use Category

Agriculture, Aquaculture, and Silviculture

## Refuge Use Type(s)

Tree harvesting (commercial)

## Refuge

Great Dismal Swamp National Wildlife Refuge

## Refuge Purpose(s) and Establishing and Acquisition Authority(ies)

- Subject to such restriction, conditions, and reservations as are specified in deeds [granted to the United States by The Nature Conservancy] … the Secretary shall administer the lands and waters and interests therein in accordance with the provisions of the National Wildlife Refuge System Administration Act … the Secretary may utilize such additional statutory authority as may be available to him for the conservation and management of wildlife and natural resources, the development of outdoor recreation opportunities, and interpretive education as appropriate to carry out the purposes of this Act … the Secretary may not acquire any such lands and waters and interests therein by purchase or exchange without first taking into account such recommendations as may result from the study required under Public Law 92-478. (Dismal Swamp Act of 1974, P.L. 93-402)
- … particular value in carrying out the national migratory bird management program. (Authorizing the Transfer of Certain Real Property for Wildlife, 16 U.S.C. 667b)
- … for the development, advancement, management, conservation, and protection of fish and wildlife resources. (16 U.S.C. 742f(a)(4);… for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition servitude. (16 U.S.C. 742f(b)(1), Fish and Wildlife Act of 1956)
- …for use as an inviolate sanctuary, or for any other management purpose, for migratory birds. (16 U.S.C. Migratory Bird Conservation Act)

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## National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System, otherwise known as 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 (Pub. L. 105-57; 111 Stat. 1252).

## Description of Use

### Is this an existing use?

Yes, this compatibility determination reviews and replaces the 2006 compatibility determination for commercial forest harvest. The 2006 compatibility determination "Restore forest types and habitat by harvesting and salvaging forest products" was developed and published in conjunction with the Great Dismal Swamp National Wildlife Refuge Comprehensive Conservation Plan. Per Service policy, compatibility determinations are reevaluated at least every 10 years (603 FW 2.11 H.).

### What is the use?

Commercial forest management will be performed at Great Dismal Swamp National Wildlife Refuge (GDS; refuge) for the primary purpose of creating and/or improving wildlife habitat where it contributes to achieving goals and objectives outlined in approved management plans (CCP 2006; HMP 2022). The establishing authorities for the refuge recognized that forest management would be required to maintain some of the forests representative of the Great Dismal Swamp ecosystem. Commercial forest management is considered to be an economic use under 50 CFR. 29.1. Commercial forest management can contribute to the refuge's purposes, improve habitat, and wildlife species goals when specifically conducted to manage and improve habitat for wildlife. Typically, these operations will involve commercial logging that will be implemented to imitate natural forces, such as fires, severe storms and hurricanes that once influenced and maintained representative habitats within the Great Dismal Swamp ecosystem. Commercial forest management may include a variety of accepted silvicultural practices. These practices could include thinning, regeneration cuts, or salvage cuts performed as a result of storm, insect or disease damage. This could yield forest products ranging from pulpwood and woodchips to sawtimber.

### Is the use a priority public use?

No

## Where would the use be conducted?

This activity could occur throughout the refuge, including any future acquired parcels, as stated in the most recent management plans; with specific reference to the 2006 Comprehensive Conservation Plan (CCP) and 2022 Habitat Management Plan (HMP), which both identify priority areas of forest management to achieve our habitat goals and objectives. Most commercial forest management activities will occur within priority 1 forest habitats at GDS to meet wildlife habitat needs. Priority one forest habitats on GDS currently include: 19,629 acres of Pond Pine Pocosin, 3,467 acres of Peatland Atlantic White Cedar, 9,000 acres of Bald Cypress-Gum, an additional 4,800 acres of Maple-Gum habitat being converted and restored to Cypress-Gum, and 3,900 acres of Mesic Mixed Hardwood. Commercial forest management may also occur in priority 2 forest habitats due to fire, storm, insect, or disease outbreaks or for habitat restoration reasons when necessary. The priority two habitats at GDS currently include: 1,500 acres of the critically imperiled Lake Drummond Pondshore, 59,000 acres of Maple-Gum Forested Wetland, and 5,440 acres of Non-riverine Pine Hardwood.

## When would the use be conducted?

Forest management may occur at different times throughout the year and at different locations, depending on individual site characteristics, stand conditions, and other resource concerns. Due to higher water levels in the winter, much of the commercial forest management will take place primarily during the spring, summer and fall to reduce impacts to the soil. All forest management will occur at times designed to minimize unwanted impacts on resources (e.g., erosion, soil compaction, or the disturbance of wildlife), while maximizing the desired silvicultural results, such as plantings, seed germination, and natural tree regeneration.

## How would the use be conducted?

Stands will be managed to diversify forest age class and structure to benefit focal wildlife species (Seymour and Hunter Jr. 1992, 2000; Kenefic and Nyland 2000; Keeton 2006; Foster et al. 2010). All harvesting will follow best forestry and wildlife management practices (BMPs) recommended by the respective state forestry agencies, Virginia Department of Forestry and North Carolina Forest Service (Bennett 2010).

Forest management activities will be directed by the refuge's HMP and tailored to each habitat type. Where commercial forest management is warranted, those activities are performed by a logging company operating under a special use permit (SUP). Project prospectus and specifications are forwarded to local and regional logging companies for competitive bidding or in some cases agreements with specific contractors to meet particular wildlife habitat needs. The refuge manager will select a company based on meeting qualifications and requirements in the project prospectus.

The refuge manager will issue the selected company a SUP. Active harvest operations may include felling trees, skidding them to a landing, processing the trees, loading logs or wood chips on trucks, and hauling the wood products offsite. Forest management treatments (e.g., trees targeted, spacing, residual tree density, harvest method, etc.) are dictated by a silvicultural prescription developed by the refuge to meet wildlife habitat needs.

Provisions listed in 50 CFR (subpart D-Permits, 25.41–45) regulate all activities under this special use permit process. The permittee would be required to comply with all Department of the Interior, U.S. Fish and Wildlife Service (Service), and Federal, State, and local laws in the conduct of their business. Because this is an economic use of the refuge, it is also subject to other applicable laws and regulations (see 50 CFR 29.1). We would continue to follow the procedures for SUPs outlined in the Service's Refuge Manual (5 RM 17.11) and other applicable laws and regulations (see also 50 CFR 29.1) when selecting permittees and administering this use.

Within a specific management unit, focal wildlife species will be identified and will act as drivers for active forest management. Where focal species-specific habitat conditions are missing, and may be created through active forest management, those areas will be prioritized for treatment.

Silvicultural treatments will be designed to meet habitat objectives within particular forest types (pine-pocosin, Atlantic white cedar, etc.), while addressing site-specific operational constraints. Active management will help restore forest structure (Kenefic and Nyland 2000; Crow et al. 2002; Bryan 2003; Keeton 2006; Raymond et al. 2009; Arseneault et al. 2011) and species composition (Leak 1975, 2003, 2005; Arseneault et al. 2011), and improve the forest's resiliency to environmental stressors like climate change (Hines, Heath and Birdsey 2010). Monitoring of forest systems and the impacts of forest management strategies will allow modification of management practices as necessary. Climate change may influence the trajectory of our forest systems in unpredictable ways, and adjustments to objectives and management strategies may occur.

Strategies for Pond Pine Pocosin habitat type (overall acreage: 19,629 acres +/-)

1. Use commercial and non-commercial mechanical treatments, where and when appropriate to improve forest composition and structure. Treatments will favor retention and regeneration of pond pine, alongside a reduction of the hardwood component where and when possible. Composition and structural goals will be driven by focal species habitat requirements with specific attention on red-cockaded woodpecker (RCW) habitat.

2. Manage this habitat type through accepted silvicultural practices to meet habitat objectives. Methods may include, but are not limited to:

3. Single tree or group selection with retention, overstory removal, clear-cut, shelterwood, and other silvicultural techniques. Treatments timed to optimize the ability of the site to regenerate the pond pine pocosin habitat type and limit impacts to peat soils

4. The size of each management unit, its silvicultural prescription and rotation age will determine the size of each treatment and the cutting interval.

5. Silvicultural techniques such as thinning, prescribed fire and herbicides may also be used to maintain and enhance this forest type.

Strategies for Peatland Atlantic White Cedar habitat type (overall acreage: 3,450 acres +/-)

1. Use commercial and non-commercial mechanical treatments, where and when appropriate, to improve forest composition and structure. Treatments will favor retention and regeneration of Atlantic white cedar (AWC) and reduction of hardwoods where and when possible. Composition and structural goals will be driven by focal species habitat requirements.

2. Manage this habitat type through accepted silvicultural practices. Methods may include, but are not limited to:

3. Single tree or group selection with retention, overstory removal, clear-cut, and shelterwood techniques.

4. Treatments timed to optimize the ability of the site to regenerate AWC and reduce impacts to peat soils

5. The size of each management unit, its silvicultural prescription and rotation age will determine the size of each treatment and the cutting interval.

6. Silvicultural techniques such as thinning, prescribed fire and herbicides may also be used to maintain and enhance this forest type.

Strategies for Cypress-Gum Swamp habitat types (overall acreage: 9,100 acres +/-)

1. Use commercial and non-commercial mechanical treatments, where and when appropriate to improve forest composition and structure. Treatment will favor retention and regeneration of bald cypress and tupelo gum when and where possible. Composition and structural goals will be driven by focal species habitat requirements.

2. Manage this habitat type through accepted silvicultural practices. Methods may include, but are not limited to:

3. Single tree or group selection with retention, overstory removal, clear-cut, and shelterwood techniques.

4. Promotion of new cohorts and maintain understory development.

5. Promotion of increased compositional and structural heterogeneity, including dense canopies, large-diameter trees, and large-diameter coarse woody debris and snags.

6. The size of each management unit, its silvicultural prescription and rotation age will determine the size of each treatment and the cutting interval.

Strategies for Mesic Mixed Hardwood habitat types (overall acreage: 4,000 acres +/-)

1. Use commercial and non-commercial mechanical treatments where and when appropriate to improve forest composition and structure. Composition and structural goals will be driven by focal species habitat requirements.

2. Manage this habitat type through accepted silvicultural practices. Methods may include, but are not limited to:

3. Single tree or group selection with retention, overstory removal, clear-cut, and shelterwood techniques.

4. The size of each management unit, its silvicultural prescription and rotation age will determine the size of each treatment and the cutting interval.

5. Silvicultural techniques such as thinning, prescribed fire and herbicides may also be used to maintain and enhance this forest type.

## Why is this use being proposed or reevaluated?

The establishing authorities for the refuge recognized that forest management would

be required to maintain some of the forests representative of the Great Dismal Swamp ecosystem. Reliance upon natural forces to maintain habitats representative of the Great Dismal Swamp ecosystem is no longer feasible due to the human-caused disruptions of fire and hydrologic regimes. The Great Dismal Swamp's forest evolved with the influence of wildfire, and many of the habitats therein rely on periodic fires and natural disturbances to guide community composition and ecological balance. However, wildfire suppression is necessary to protect life and property in the surrounding communities. Therefore, in order to accomplish the refuge's mission of restoring and maintaining rare forest types, active habitat manipulation is required.

Restoration requires an active, hands-on approach, guided by science-based methods. It is an approach that includes tree-planting, tree-removal, and prescribed burns in order to promote new generations of native trees. More specifically, forest management can improve and accelerate development of historic forest structure and species composition (Seymour, White, and deMaynadier 2002; Keeton 2006; Franklin, Mitchell, and Palik 2007; North and Keeton 2008; Raymond et al. 2009; Arseneault et al. 2011). In the absence of active management, the development of appropriate wildlife habitat may take longer or fail entirely, depending on site characteristics, prior management history, and natural disturbance frequency. A forest can be actively managed through harvesting practices to mimic natural disturbances and create openings for young trees while also retaining some larger, older trees. This prescription will also maintain the appropriate forest structure and age or size classes important to focal species into the future, ensuring adequate habitat is always available for species of concern. Making the timber harvest commercially viable makes it economically feasible for the refuge to maintain these habitats.

In summary, an active forest management program, with the use of commercial forestry practices, will improve refuge wildlife habitat while contributing to the forest-based economies of communities surrounding the refuge

## Availability of Resources

The refuge lacks the funding, personnel, and equipment to effectively and efficiently manage its forested lands. Engaging private logging companies as part of a commercial arrangement is the only practical alternative for accomplishing this work. A portion of funds generated by the sale of timber on refuge lands will go into the revenue sharing fund. Another portion will fund the forest management program, including additional stand inventories, timber marking, pre-commercial thinning, related road maintenance, and plantings (if prescribed). When appropriate, infrastructure maintenance associated with timber sales, such as road maintenance, will be included as a deliverable in the SUP. This flexibility alleviates additional management costs associated with active forest management.

All harvesting is likely to occur near, or from, the existing road networks. There are no expected road construction costs associated with active forest management on refuge property.

Outside of costs offset by timber sale receipts, required yearly costs to administer an active forest management program on refuge lands is listed below:

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|---|---|
| Develop prescriptions; circulate prospectuses for bid; sale layout; onsite representative with logger: | $9,000 (8 week/year) |
| Review proposals, issue special use permits: | $1,000 (2 days/year) |
| Total Annual Cost of Program: | $10,000 |

## Anticipated Impacts of the Use

### Potential impacts of a proposed use on the refuge's purpose(s) and the Refuge System mission

The effects and impacts of the proposed use to refuge resources, whether adverse or beneficial, are those that are reasonably foreseeable and have a reasonably close causal relationship to the proposed use. This CD includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an "affected resource."

### Short-term impacts

**Soil Impacts:**

Operation of heavy equipment may impact soil causing compaction, rutting and erosion (Helfrich, Weigmann, and Neves 1998; Wiest 1998; Cullen 2001). Minor sedimentation could occur in the ditches adjacent to the treatment sites. Soil disturbance following deforestation may increase the export of particulate matter and soil nutrients (Bormann et al. 1968, 1974).

**Aquatic Resource Impacts:**

Forest management operations may have significant impacts on refuge water quality. Data from forested experimental watersheds in the eastern United States indicate that leaching of nutrients after timber harvesting, especially clearcutting, tends to increase (Bormann et al. 1968, 1974). Increases in stream water temperature are highest where revegetation of cutover areas is delayed (Demaynadier and Hunter Jr.

1995; Cullen 2001). These factors may have detrimental effects on stream organisms, including fish, invertebrates, and amphibians (Campbell and Doeg 1989).

**Wildlife and Vegetation Impacts:**

Commercial forest management can have a number of localized and broader impacts on wildlife-related components of forests including damage to understory vegetation (Scheller and Mladenoff 2002), alteration of microhabitat environments (Demaynadier and Hunter Jr. 1995), changes in the abundance and type of coarse woody debris (Demaynadier and Hunter Jr. 1995; Siitonen 2001), and removal of snags important to wildlife. Damage to uncut trees from heavy equipment may create entry points for invasion by insects or disease (Nichols, Lemin Jr., and Ostrofsky 1994). Harvesting may also facilitate the spread of invasive plants (Sakai et al. 2001) and disturb wildlife temporarily (Demaynadier and Hunter Jr. 1995; Campbell, Witham and Hunter 2007; and Holmes and Pitt 2007).

Two federally listed species occur on the refuge; the (RCW) and the northern long-eared bat. The refuge uses mechanical removal of trees and vegetation as a management strategy for obtaining a desired stand density and species composition ideal for RCW habitat. Timber operations in RCW-managed areas will involve careful planning and implementation to reduce impacts on the species.

We do not expect any negative impacts to the northern long-eared bats from forest management on the refuge because we will follow the stipulations outlined in the 4(d) rule and will also continue to consult with the Service's Ecological Services program to ensure our habitat management does not negatively impact the species.

**Visitor Impacts:**

Logging may disturb refuge visitors, cause safety issues, or detract from visitors' aesthetic experience. When safety considerations warrant, areas of the refuge undergoing active forest management will be temporarily closed. Trails will either be closed or shared with logging trucks depending on the availability of feasible alternatives. Because small portions of the refuge's acreage will be actively harvested at any one time, impacts to visitors will be minimal and can be mitigated to an acceptable level

## Long-term impacts

**Soil Impacts:**

Soil impacts from forest harvest activities will be predominately short-term. Compaction caused by heavy machinery could have localized minor impacts on long-term peat recovery in affected areas. To reduce the potential for soil impacts, timber harvest operations will utilize low ground pressure equipment, corduroy skid trails

and aerial forwarding (such as by helicopter) when feasible. Timber operations will utilize existing refuge and public roads.

**Aquatic Resource Impacts:**

Poorly planned timber harvests and road construction can alter surface and groundwater hydrology and water storage capability. These impacts can persist long-term and the effects of multiple harvests in a watershed can accumulate over time.

Maintaining forested buffers near streams and other aquatic resources minimizes impact on water resources and water quality (Osborne and Kovacic 1993; Castelle, Johnson, and Conolly 1994; Wilkerson et al. 2006; Bennett 2010). Road maintenance, skid trail planning, harvest operation and ditch crossings will, at a minimum, follow the best management practices promulgated by each state's forestry agency to minimize the alteration of hydrology and the impacts of siltation on water quality.

**Wildlife and Vegetation Impacts:**

Less downed wood and fewer large-diameter logs are likely to accumulate under a short-rotation (less than 50 years) harvest, whole-tree harvests, and selection cuts than would occur under long rotations or in uncut forests, affecting soil moisture regimes and forest floor amphibians and small mammals (Gore and Patterson III 1986; Demaynadier and Hunter Jr. 1995). Harvesting may also leave the remaining trees more susceptible to wind throw (Ruel 1995) and facilitate the spread of invasive plants (Sakai et al. 2001) which may have long-term implications on biodiversity if mitigation measures are unsuccessful.

Mitigation of much of these impacts is possible through careful planning and implementation. Seasonal restrictions on harvesting will minimize disturbance to wildlife and damage to residual trees or understory vegetation. The careful layout of skid trails, the use of mechanical harvesters and forwarders, and the pre-harvest surveys of resources of concern will minimize impacts. The SUPs will require contractors to leave an appropriate volume of tops, branches, and other downed wood onsite whenever possible.

Furthermore, forest harvest operations in RCW-managed areas will involve careful planning and implementation to enhance the long-term suitability of this habitat for RCW populations.

**Visitor Impacts:**

Long-term impacts of timber harvesting on visitors are expected to be minimal. Visitors may see residual evidence of harvest activities, such as former skid trails and cut trees. Forest management activities on the refuge are intended to enhance wildlife habitat by improving forest structure and encourage diverse forest habitats

which may lead to long-term positive impacts on visitor experience.

## Public Review and Comment

The draft compatibility determination will be available for public review and comment for 30 days from May 27, 2022 to June 27, 2022. The public will be made aware of this comment opportunity through the station webpage, social media page, and local news outlets. State and Tribes have been asked to review and comment onthe draft compatibility determination. A hard copy of this document will be posted at the refuge Headquarters and Visitor Contact Center (3100 Desert Road, Suffolk). It will be made available electronically on the refuge website (www.fws.gov/refuge/great_dismal_swamp). Please let us know if you need the documents in an alternative format. Concerns expressed during the public comment period will be addressed in the final.

## Determination

### Is the use compatible?

Yes

## Stipulations Necessary to Ensure Compatibility

1. 
2. Forest management actions are an economic use conducted to implement critical habitat management programs for the refuge. Therefore, these forest management action will be consistent with approved management plans and programs that outline the habitat restoration needs for the refuge.
3. Low ground pressure equipment will be required in lowland habitats to minimize compaction on peat soils.
4. Equipment-free buffer areas may be established around designated trees to limit compaction and damage to the roots of sensitive species such as Pond Pine
5. Where federally listed species occur, forest management activities will require Section 7 consultation under the Endangered Species Act. To reduce disturbance and potentials impacts on the RCW, forest management operations will not occur during RCW breeding season (April 1 -July 1), and for 30 days post-translocation, in RCW management units (the Blocks) or any management unit with an active breeding group
6. State recommended best management strategies and buffer distances will be implemented as appropriate. This includes an emphasis on proper use of brush mats to reduce soil compaction and erosion. In some instances, the refuge may

exceed state recommendations for specific resource protection objectives, such as with an equipment-free buffer around mature pine trees in designated Red-cockaded woodpecker habitat.

7. Resource surveys identifying items of concern will be a consistent part of pre-management planning efforts. During management activities impacts to resources of concern will be minimized or eliminated.
8. Active forest management will occur when site-specific soil conditions are appropriate to minimize negative impacts to soils and water quality. The use of heavy equipment will be halted during periods of excessive wetness. Timing of management activities will minimize impacts on wildlife (e.g., outside bird nesting seasons and red-cockaded woodpecker translocation periods). The refuge manager reserves the right to temporarily suspend harvesting operations during such times.
9. The SUP holder will ensure that all equipment is maintained such that hazardous waste (e.g., oil, hydraulic fluid) does not come into contact with the ground. If there are any spills, cleanup will commence immediately.
10. The permittee is required to clean all harvesting equipment prior to transport onto the refuge to prevent introduction of nonnative plant species. Prior to entering upon refuge property, equipment may be inspected by refuge staff for presence of plant material, seeds, etc. Equipment presenting a high risk of contamination may be cleaned and re-inspected before being allowed on the refuge property
11. Location of access roads, major skid trails, and log landing or yards shall be approved by the refuge before establishment and/or use. Locations will be selected to minimize damage to resources, such as areas of drier ground to reduce compaction and soil disturbance. Locations will also be selected for based on proximity to established red-cockaded woodpecker nesting sites and other resources of concern.
12. The refuge manager may modify the SUP to protect any sensitive cultural resources area, object of antiquity, artifact, or similar object which is entitled to protection under the Antiquities Act of 1906, Archeological Resources Protection Act of 1979, and National Historic Preservation Act of 1966. Discovery of such areas or objects by either party shall be promptly reported to the other party.

## Justification

The refuge's establishing legislation directed that a timber management program be conducted on the refuge and stated, through the Secretary's report of 1974, that "commercial timbering for the sake of revenue will not be considered as an objective of management." Timber management will be used primarily to imitate natural influences, especially fire that used to shape and maintain the natural biological

diversity of the Great Dismal Swamp ecosystem.

All timber management practices performed will be for the primary purpose of achieving restoration and other habitat and wildlife management objectives. It will be to the benefit of the government to accomplish forested habitat restoration goals via commercial timber harvest as opposed to paying a contractor to remove the timber where possible. Whether the harvest is a goods-for-services setup or a timber sale contract where the purchaser pays the government is immaterial. The objective of restoring and managing habitat is met at the least cost to the government, and the resulting resources are utilized where feasible. The restoration and protection of the diversity of plants and animals in the Great Dismal Swamp is the congressionally mandated purpose of the refuge. Timber harvest will contribute to the achievement of the purposes and mission of the Great Dismal Swamp NWR and the Refuge System.

This use is determined to be compatible, provided the stipulations necessary to ensure its compatibility are implemented. Commercial forest management to improve wildlife habitat will contribute to the purposes for which the refuge was established and the mission of the Refuge System and facilitate the ability of the refuge to meet its wildlife management objectives. The use will not pose significant adverse effects on refuge resources, interfere with the public use of the refuge, or cause an undue administrative burden. The forest management program may adapt to insure its continued compatibility. Forest management will not materially interfere with or detract from the mission of the Refuge System or the purposes for which the refuge was established. Commercial forest management will contribute to the refuge's purposes and help meet refuge habitat and species goals by increasing forest diversity, improving habitat, and restoring the unique Great Dismal Swamp ecosystem.

## Signature of Determination

Refuge Manager Signature and Date

## Signature of Concurrence

Assistant Regional Director Signature and Date

## Mandatory Reevaluation Date

January 2037

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